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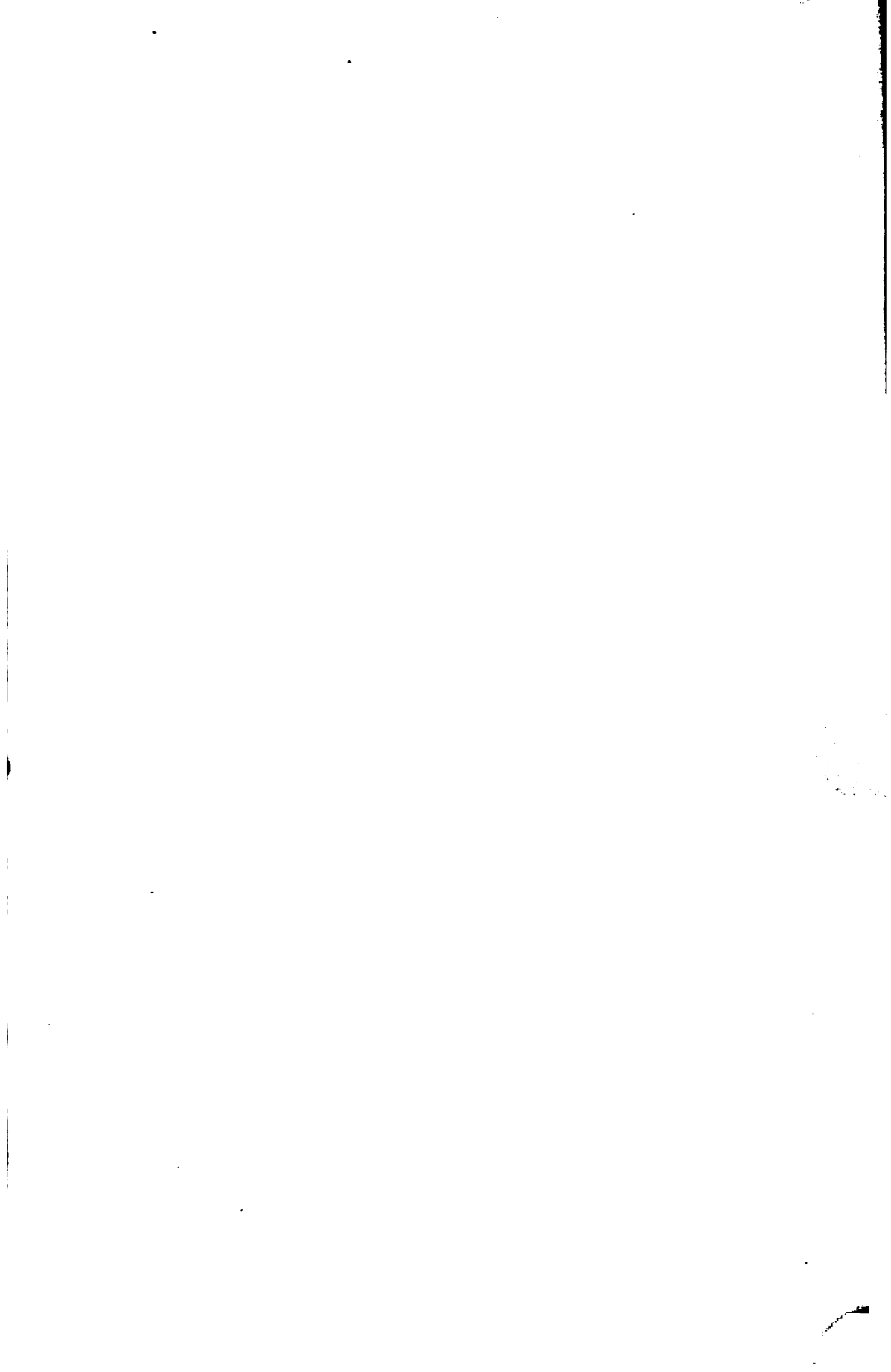
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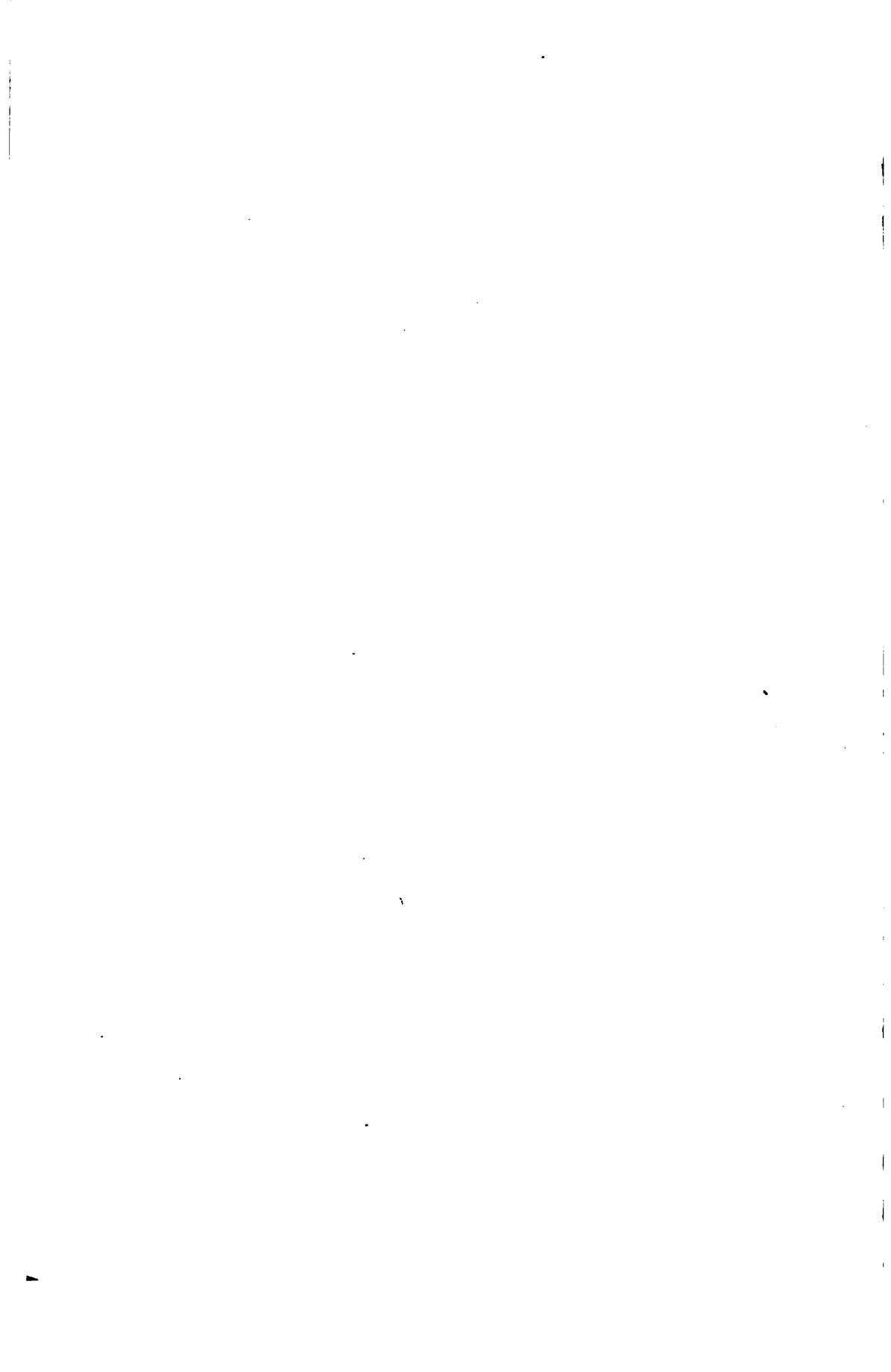
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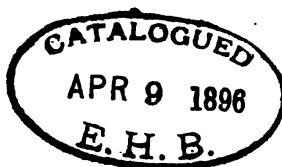
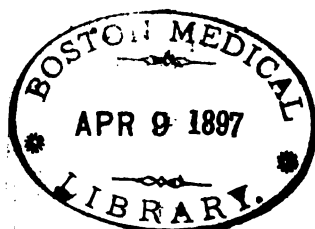
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CONTRACTIONS OF TITLES.

The following is a list of the contractions and the corresponding full titles of Journals most frequently used in "The Month." The titles prefixed by a Star are those of official Journals.

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| <ul style="list-style-type: none">* <i>Amer. Journ. Pharm.</i> = American Journal of Pharmacy. Philadelphia. Monthly.<i>Annalen</i> = Justus Liebig's Annalen der Chemie. Leipzig. Monthly.* <i>Apot.-Zeit.</i> = Apotheker-Zeitung. Organ of the Deutsche Apotheker-Verein. Berlin. Twice a week.* <i>Apot. Zeit. Rep.</i> = Repertorium der Pharmacie. Supplement to the Apotheker-Zeitung.* <i>Archiv</i> = Archiv der Pharmacie. Berlin: J. Greiss. Monthly.* <i>Berichte</i> = Berichte der deutschen chemischen Gesellschaft. Berlin. Once or twice a month.* <i>Brit. Med. Journ.</i> = British Medical Journal, London. Weekly.<i>Bull. com.</i> = Bulletin commercial. Supplement to L'union pharmaceutique. Paris: Pharmacie centrale de France. Monthly.* <i>Can. Pharm. Journ.</i> = Canadian Pharmaceutical Journal. Toronto. Monthly.<i>Chem. Zeit.</i> = Chemiker Zeitung. Cöthen. Twice a week.<i>Chem. Zeit., Rep.</i> = Chemisches Repertorium. Supplement to the Chemiker Zeitung. | <ul style="list-style-type: none">* <i>Compt. rend.</i> = Comptes rendus des séances de l'Académie des Sciences. Paris: Gauthier-Villars. Weekly.* <i>Journ de pharm.</i> = Journal de pharmacie et de chimie. Paris: G. Masson. Twice a month.<i>Med. Press</i> = Medical Press and Circular. London: A. A. Tindall. Weekly.<i>Mon. scient.</i> = Moniteur scientifique. Paris. Monthly.<i>Münch. med. Woch.</i> = Münchener medicinische Wochenschrift. Munich. Weekly.<i>Nouv. rém.</i> = Les nouveaux remèdes. Paris. Twice a month.<i>Pharm. Centralh.</i> = Pharmaceutische Centralhalle Dresden. Weekly.<i>Pharm. Post</i> = Pharmaceutische Post. Vienna. Weekly.<i>Pharm. Zeit.</i> = Pharmaceutische Zeitung. Berlin: J. Springer. Twice a week.<i>Répertoire</i> = Répertoire de pharmacie, archives de pharmacie, et journal de chimie médicale réunis. Paris. Monthly.<i>Scient. Amer.</i> = Scientific American. New York. Weekly.<i>Union pharm.</i> = L'union pharmaceutique. Paris: Pharmacie centrale de France. Monthly. |
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FLUORESCENCE OR PHOSPHORESCENCE, AND PHOTOGRAPHIC ACTION AT LOW TEMPERATURES.

Continued investigation of the properties of matter at extremely low temperatures has resulted in a considerable addition to our stock of knowledge on this subject, more especially in regard to phosphorescence and photographic action, and at a special meeting of the Chemical Society, held at the Royal Institution on Thursday, June 28, Professor Dewar, LL.D., described and illustrated in a most brilliant and successful manner his recent observations in that direction. A brief account of the experiments performed on the occasion is here appended, prefaced by a general statement of what was previously known of the phenomena chiefly considered by the lecturer.

NATURE OF FLUORESCENCE OR PHOSPHORESCENCE.

Fluorescence and phosphorescence are terms applied to similar phenomena, which apparently differ in degree only, the first being practically an instantaneous effect, whilst the other lasts for a measurable time. Familiar examples of fluorescence are seen in solutions of quinine sulphate acidulated with sulphuric acid, and some specimens of paraffin oil; and Stokes has shown that the singular surface appearances observed in these liquids are due to a change of refrangibility of the light absorbed, and again given off, by their upper layers. "In every case the fluorescent light appears to belong to a less refrangible part of the spectrum than does the incident light which gave rise to it, thus affording an instance of dissipation, or degradation, of energy" (Tait on "Light"). The duration of fluorescence is very brief, and in this respect alone does it appear to differ from phosphorescence, which, as already stated, lasts for a measurable time.

Phosphorescence, therefore, may be regarded as "merely a species of fluorescence which lasts for a much longer time after the excitation has ceased," and, briefly defined, is the phenomenon observed when certain substances give out light (usually in an altered form) that has been previously absorbed. In this, the most correct, sense of the term it must not be confused with the luminosity due to the slow oxidation of phosphorus, the acid vapours from which shine in the dark with a faint bluish light; nor with the "phosphorescent" appearance accompanying the slow combustion of decaying animal and vegetable matter; nor with the more or less voluntary display of light by fire-flies, glow-worms, and small marine animals.

PHOSPHORESCENT OR FLUORESCENT BODIES.

The substances in which true phosphorescence was first observed were barium sulphide (Bologna stone) and calcium chloride (Homberg's phosphorus), during the seventeenth century, calcium sulphide (Canton's phosphorus) in 1768, and, later, strontium sulphide. When carefully preserved from the air, in sealed glass tubes, these compounds appear brilliantly luminous in a dark room, after exposure to bright sunlight, and for a long time present the general aspect of cooling bodies.

The list of truly phosphorescent bodies has been greatly extended, however, and knowledge of their peculiarities in this direction increased, as the result of investigations instituted by Professor Dewar, in connection with his work on the liquefaction of gases and observations of the properties of substances at extremely low temperatures. Thus, he was able to demonstrate before the Chemical Society that oxygen is itself fluorescent. On passing a stream of this gas or air, after being electrically stimulated, through a very large vacuum tube highly exhausted, a comet-like globe of phosphorescent light was visible, and ozone was formed in the tube, apparently indicating that some kind of molecular change had occurred. It is essential that the air employed should be filtered, as any considerable proportion of organic matter destroys the fluorescence, and the length of the luminous brush formed is inversely proportional to the amount of such impurity present. Even the dispersion of a little ether or perfume in the room may render the experiment impossible for hours. Hydrogen also destroys the fluorescence. The phenomenon is only produced by gases containing oxygen, being shown to a slight extent by carbon dioxide. In the case of calcium sulphide which, after exposure to electric or magnesium light, is highly luminous, cooling by contact with solid carbon dioxide diminishes the phosphorescence, and it is entirely suspended at -80° , though subsequently warming restores the light.

ELASTICITY AS MODIFIED AT LOW TEMPERATURES.

A number of experiments were performed to illustrate the nature of the work which had led up to the results obtained in regard to phosphorescence. Thus, the highly selective character of the oxygen spectrum was shown when a tube containing liquid oxygen was placed in the spectroscopic, the dark bands being very distinctly visible in the spectrum thrown upon a screen. Experiments were also performed which illustrated the modification in elastic properties in bodies cooled to low temperatures, the breaking strain of metals,

for example, being increased. This modification of elasticity—both longitudinal and torsional—was clearly shown by cooling spirals of very soft metal in liquid oxygen, to -180° , when they became perfectly rigid and sonorous like iron. The influence of similar cooling upon hard steel was demonstrated by comparing the notes from two tuning forks in perfect unison. On cooling one to -180° its elastic constants were modified, thus causing it to vibrate quicker than the other, and the number of beats showed the increased elasticity.

PHOTOGRAPHIC ACTION AT LOW TEMPERATURES.

Former experiments of the lecturer have shown that no direct chemical action can be brought about by the contact of bodies like liquid oxygen and phosphorus or potassium. Nor can any form of voltaic cell continue to produce electricity when cooled to -180° C. Photographic action can, however, be carried on at the lowest temperature yet reached, though reduced to the extent of more than 80 per cent. at -200° . Thus, chloride of silver paper when partly sponged with liquid oxygen and exposed to bright light, quickly turns brown except where cooled, little or no action taking place at that spot. In the case of two very sensitive photographic films in which chemical action had taken place at similarly low temperatures, magnesium wire had been burned in the dark room as a means of stimulation, and phosphorescence had resulted. It was also shown that the colours of bodies and their specific absorption are materially affected at low temperatures. Thus, liquid oxygen turns red iodide of mercury yellow.

OTHER PHOSPHORESCENT BODIES.

Dealing then with a number of bodies in detail, Professor Dewar showed that gelatin, celluloid, paraffin, ivory, horn, and indiarubber become distinctly luminous, with a bluish or greenish phosphorescence, after cooling to -180° and being stimulated by the electric light. Hydrokinone was more luminous than the isomeric resorcin or pyrocatechin, and in the same way pyrogallol acid was faint compared with phloroglucin. All alkaloids forming fluorescent solutions become phosphorescent at low temperatures. The hydrocarbons, alcohols, acids, and ethers of the fatty series are all more or less active, and glycerin, sulphuric and nitric acids are all very bright, whilst concentrated hydrochloric acid and strong ammonia are also very bright. Coloured salts generally show little activity. Water when pure is only feebly phosphorescent, but remarkably so when impure. Acetic acid and acetamide appeared fairly equal in luminosity; hippuric acid was very fine, as were most substances containing a ketone group. Lithium platino-cyanide changed from white to red on cooling, and was excelled in phosphorescing power by yellow ammonium platino-cyanide, which was exceedingly bright.

Definite organic substances possessing exceptional powers of phosphorescence when stimulated at -180° C. are acetophenone, benzophenone, asparagin, hippuric acid, phthalic anhydride, urea, creatin, urethane, succinimide, tri-phenyl methane, di-phenyl, salicylic acid, glycogen, aldehyde, ammonia, etc. It will require long and laborious

experiments, however, to measure the relative brightness of the phosphorescence of bodies belonging to definite series.

Remarkable results were obtained with an egg and a feather respectively. The egg shone brilliantly as a globe of blue light, and the feather was equally brilliant, its outline showing clearly in the darkened room. Other organic substances giving good results were cotton-wool, paper, leather, linen, tortoise-shell, and sponge, all phosphorescing brightly, as did also a white flower, apparently a cultivated species of *Dianthus*. Coloured glasses and papers as a rule exhibit no phosphorescence, and when the alcohols are coloured by the addition of a trace of iodine, the luminous effect is destroyed. Milk was shown to be highly phosphorescent and much brighter than water.

Metals also phosphoresce, but in this case the action is due to some organic film deposited from the air, because it disappears on ignition. If the metal is subsequently touched the phosphorescence re-appears. The crowning experiment was performed with ordinary albumin. This is one of the most difficult bodies to cool properly, on account of its tendency to expand and break the tubes. It was shown, however, to possess greater phosphorescing power than the yolk of egg, white bodies generally being superior in this respect to coloured ones, and on cooling a layer on the outside of a test-tube and exposing it to light passing through a quartz lens, it exhibited a brilliancy that was great in the extreme. The difference in luminosity when glass intervened was due, of course, to the fact that glass is somewhat opaque to the violet and ultra-violet rays, the latter of which are most necessary to stimulate bodies and so induce phosphorescence.

Caustic soda and many salts not normally phosphorescent were markedly so at low temperatures. The chloro-, bromo-, iodo-, sulpho-, and nitro-substituted bodies, as a rule, show nothing, or are but faintly luminous. Amongst basic bodies nicotine is more luminous than quinoline or pyridine.

POSSIBLE OUTCOME OF THE WORK.

The suggestion has been made that, as an outcome of these experiments, some connection may be shown to exist between phosphorescence and the structure of matter, and already Professor Dewar has reason to believe that bodies may be naturally classified according to their luminous power at low temperatures. As a provisional generalisation it may be considered that, the greater the complexity of structure in a body, the more likely is it to phosphoresce; on account probably of the increased facility with which its structure enables it to take up the light vibrations. The idea also suggests itself that the luminosity of some of the heavenly bodies may be due to phosphorescence at extremely low temperatures. However this may be, there seems to be a decided probability of fresh light being thrown on the constitution of matter, by the researches now being carried on in the former workshop of the illustrious Faraday, by his distinguished successor, and everyone interested in the progress of physical and chemical science will wait with interest for further developments.

Oxford and its University.

(Continued from Vol. xxiv., p. 1092.)

THE UNIVERSITY AND ITS COLLEGES.

The establishment of universities throughout Europe seems to have been the result of a studious spirit engendered by contact of the western nations with the more cultured people of the East, during the time of the Crusades. Wandering teachers, desiring to spread the knowledge they had acquired, gathered together at chosen centres and lectured to thousands of eager young scholars, drawn from all parts. Schools that had been established for many years, at Oxford and elsewhere, were thus revived, and the outcome was so remarkable as to lead to this period being termed the Mediæval Renaissance. As a result of this intellectual revival, at the beginning of the thirteenth century, Oxford was unrivalled as an English educational centre, and took place in the front rank of European schools.

According to Goldwin Smith and the late Professor Freeman, the University of Oxford was born in the twelfth century, fully a century before the foundation of the first college. The teachers formed themselves into a guild, of which undergraduates were regarded as apprentices, and the degree was originally a licence to teach, carrying with it also the duty of teaching. A charter was obtained by the University, a Chancellor was elected, the graduates—forming an academical Legislature—obtained jurisdiction over the members of the body corporate, and, in time, the teachers and students were marshalled into regular Faculties. At first the professors taught where they could, and the students were mostly poor. They lodged with the citizens, as “chamberdekyns,” but were afterwards gathered into hostels or halls (*aula*) where they were boarded and governed by Principals or Masters of the University. Some of these halls later became colleges, and such as yet remain are similar to the colleges, except that they are not corporate bodies, and possess no fellowships.

The first college to be founded was Merton, in 1264, though University and Balliol are usually dated earlier in deference to the priority of the benefactions out of which they grew. Walter de Merton, the first Founder, was a sometime Chancellor of Henry III., and his College became the pattern for University, Balliol, Exeter, Oriel, and Queen's, at Oxford, as well as for certain colleges at Cambridge. University College, the proper corporate style of which is the Great Hall of the University, claims Alfred the Great as its founder, and in 1872 celebrated its alleged thousandth anniversary. Originally, however, it was only a “hall” where divinity students were lodged, William of Durham having left the University a sum of money for their maintenance, and its first statutes date from 1280. Balliol College was founded by Sir John de Balliol, father of the Scottish king of that name, about 1268; Oriel by Adam de Brome, a court almoner; Exeter by a political bishop of the diocese of that name, Walter de Stapleton, who was killed in a London insurrection; Queen's by Robert de Eglesfield, court

chaplain to Queen Philippa. New College “was the work of William of Wykeham, Bishop of Winchester . . . prelate, statesman, and court architect in one, who negotiated the peace of Bretigny and built Windsor Castle.” Lincoln, All Souls', Magdalen, and Brasenose were founded in the interval between the foundation of New College and the Reformation, and Corpus Christi towards the end of the same period. The Founder of Magdalen was Waynflete, Bishop of Winchester and Chancellor of Henry VI., another statesman-prelate. This college is distinguished by “the most beautiful of towers.” “Of all the houses of learning in England, perhaps of any country, that which Waynflete founded is the loveliest, as he will say who stands in its cloistered and ivy-mantled quadrangle, either beneath the light of the summer's sun or that of the winter's moon.” Christ Church is the imperfect realisation of Wolsey's conception of an institution where the new learning should be cultivated on a scale of unparalleled magnificence. The tower in which Great Tom hangs, and is tolled every night a hundred and one times for the hundred and one students of the college, was the work of Wren. The church of St. Frideswide's Monastery does duty as the college chapel, and also serves as the cathedral of the diocese of Oxford. Christ Church Hall is described as being—after Westminster Hall—the finest room in England.

Of the remaining colleges, Trinity and St. John's rose from the wreck of other houses; Jesus and Wadham were respectively the first and second distinctly protestant colleges; Pembroke College was founded during the period between the Reformation and the Rebellion, at a time when many of the older foundations were being extended; and the buildings of Worcester include some of the few remaining relics of monastic Oxford. Keble and Hertford are quite modern, the first being founded in memory of the author of “The Christian Year,” and remaining as a monument of “Tractarianism;” whilst Hertford, originally Hart Hall, and later Magdalen Hall, is due, as it now stands, to the munificence of Mr. Baring.

In all, there are now connected with Oxford University twenty-one colleges, two halls, three private halls, and two Nonconformist theological institutions—known as Mansfield and Manchester Colleges. These colleges are not affiliated to the University, and do not receive undergraduates in the ordinary way, but are places of theological instruction. Mansfield was erected by the Congregationalists, and Manchester by the Unitarians.

In addition to the undergraduates connected with the different colleges and halls, there are many students who are “unattached,” that is, not connected with any such institution. They are under the control of a “Censor,” who is a member of a body delegated to maintain discipline, and occupies generally the position of the Head of a College. There are altogether, at the present time, more than twelve thousand members of the University, of whom probably one-fourth are in residence at Oxford, including about two hundred and fifty “unattached” students.

The following are the names of the Colleges and Halls, arranged according to the reputed dates of

their foundation, and with the number of undergraduates connected with them stated:—

College or Hall.	Founded	Under-graduates.	Head.
Merton	1264	129	Master
Balliol	1268	236	Master
University	1280	128	Warden
Exeter	1314	161	Rector
Oriel	1326	99	Provost
Queen's.....	1340	119	Provost
New College ..	1379	253	Warden
Lincoln.....	1427	79	Rector
All Souls'	1437	6	Warden
Magdalen.....	1458	173	President
Braenose.....	1509	127	Principal
Corpus Christi...	1516	85	President
Christ Church...	1546	295	Dean
Trinity	1554	178	President
St. John's.....	1555	132	President
Jesus.....	1571	93	Vice-Principal
Wadham	1612	89	Warden
Pembroke.....	1624	85	Master
Worcester	1714	104	Provost
Keeble	1870	202	Warden
Hertford	1874	86	Principal
Mansfield	1886		Principal
Manchester	1891		Principal
St. Edmund Hall	1226	36	Principal
St. Mary Hall ...	1436	49	Principal
Marcon's Hall } Private		35	Principal
Turrell's Hall } Private		6	Principal
Grindle's Hall } Private		3	Principal
Total...		2988	

The constitution of the University of Oxford has been aptly compared to that of the United States, since it is a federation of self-governing Colleges. The nominal head is the Chancellor, usually a political leader, the present Chancellor being the Marquis of Salisbury, K.G. The acting chief, however, is the Vice-Chancellor, who is selected from the Heads of Colleges, and the present Vice-Chancellor is Dr. Boyd, Principal of Hertford College.

Some time after the Reformation great changes took place in the University as originally constituted, for, resembling others in this respect, it became a place of general education rather than a mart of available knowledge, and its advantages were secured by the rich instead of the poor for whom they were intended by the Founders. The colleges had absorbed most of the halls; the system of college instruction gradually replaced the lectures of University professors; "the College Statutes became more and more collectively the law of the University," and the Heads of Colleges became the governors of the University, forming a Board called the Hebdomadal Council. Other changes have occurred from time to time, however, and the University Legislature now consists of an elective Council of Heads of Colleges, professors, and Masters of Arts; the Congregation of residents, mostly teachers; and the Convocation of all Masters of Arts of the University. Legislation is initiated by the Council, and subsequently has to pass the other two houses. Each College, also, possesses its own governing body, consisting of a Head (President, Master, Principal, Provost, or Warden) and Fellows, and has also a private staff of tutors.

(To be continued).

"A MAGNIFICENT ENDOWMENT."

Under this heading the *Times* of Tuesday gives an article from which the following details are taken:—

A proposal was made, so far back as 1843, for establishing at the Royal Institution a school for instruction and research in chemistry. It was strongly approved by Professors Faraday and Brande, but, unfortunately, the space at the disposal of the managers was too limited to permit of the scheme being carried into effect. Shortly afterwards the Royal College of Chemistry was founded for teaching the science practically, and numerous schools have since been established for the same purpose, but no adequate provision has up to the present time been made for carrying on systematic research work.

This want is now to be supplied, however, and in connection with the place where it was originally suggested, for at the general monthly meeting of the Royal Institution, on Monday last, the managers announced their acceptance of a munificent offer by Dr. Ludwig Mond, F.R.S., of the great chemical manufacturing firm of "Brunner, Mond and Co."

Dr. Mond, having purchased the freehold house, No. 20, Albemarle Street, has resolved to convey it in fee simple to the Royal Institution, the buildings of which it adjoins. In addition, he intends to defray the whole expense of converting it into a laboratory adapted for chemical and physical research, and equipping it with everything needful for conducting these upon a large scale. It is to be styled the "Davy-Faraday Research Laboratory," and will also be endowed by its munificent founder with an income sufficient to defray all expenses of maintenance, etc., as well as the salaries and incidental expenses of a trained scientific staff, so that the work may be carried on in an adequate and business-like manner. No one can fail to appreciate the peculiar appropriateness of this unexampled return to science of that which has been gained by its aid.

A managing committee will be nominated by the managers of the Royal Institution, and Dr. Mond has expressed the desire that the resident professor should accept the position of Director of the new laboratory. This is to be free to individuals of either sex and any nationality, and the sole condition of admittance will be that the persons shall be, in the opinion of the managers, fully qualified to undertake scientific investigation, preference being given to those who have already done original work.

In thus realising the idea of half a century ago, Dr. Mond is also providing additional accommodation for the existing Institution, since it will now be possible to extend the library and the present chemical laboratory. His conclusion that the new laboratory would have the greatest prospect of success if connected with the Institution which has always fostered research, will commend itself to all who have realised the importance of the results attained by the illustrious investigators who have worked there from its foundation to the present time. Dr. Mond hopes that others may found scholarships and bursaries to enable promising students without means to avail themselves of the opportunities now offered, and this suggestion deserves the fullest consideration.

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Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.C.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMIDGE, Secretary, 16, Bloomsbury Square, London, W.C.

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THE COUNCIL MEETING.

At the meeting last Wednesday, after the reading and confirmation of the minutes of the previous meeting, the PRESIDENT announced that Mr. J. LAIDLAW EWING had been re-elected Chairman of the Executive of the North British Branch of the Society, and that Mr. CHARLES KERR has been elected Vice-Chairman.

Letters from Professors REMINGTON and RUSBY and Dr. G. WATT, acknowledging the honour conferred by their appointment as honorary and corresponding members of the Pharmaceutical Society, were read by the PRESIDENT, who also mentioned that Mr. CARR had been nominated by the Research Committee for the Salters' Scholarship.

The business arising out of the reports of the Finance, Benevolent Fund, and Library, etc., Committees was mainly of a routine character. The VICE-PRESIDENT referred to a visit he had paid, with Mr. WALTER HILLS and the Secretary, to the Watford Orphan Asylum, speaking in high terms of the conditions under which the inmates are placed in that institution.

The announcement that Mr. WALTER HILLS has accepted the invitation of the Library, etc., Committee to deliver the inaugural sessional address at the opening of the Society's School in October was received with much satisfaction.

In response to an application from the local Chemists' Association at Plymouth for a materia medica cabinet, the recommendation of the Committee that a grant of twenty pounds should be made was adopted.

The appointment of the staff of the School of Pharmacy and of delegates to the British Pharmaceutical Conference was then proceeded with.

Mr. MARTINDALE, in proceeding with the motion standing in his name upon the agenda, reviewed the action taken by the Society in regard to the metric system of weights and measures, contending also for the desirability of its adoption in dispensing, and that such a step would not be attended with any real difficulties. His own experience as an

examiner had shown him that candidates had little practical knowledge of the metric system. He disapproved of the attempts which have been made to introduce it partially, and he had therefore brought forward his motion in order to have the question thoroughly discussed, since this country and India were the only exceptions to the adoption of the metric system. He referred to the result of the discussion at the International Congress at Chicago, and hoped his motion would receive from Mr. MARTIN the same support that he had given to the resolution then passed, as to the desirability of the metric system being the only system of weights and measures used in a pharmacopœia.

Mr. RYMER YOUNG, in seconding the motion, expressed the opinion that it was most important pharmacists should feel as confident in dealing with prescriptions written in the metric system as with others. The objection that mistakes might arise from misuse of the decimal point applied equally to the present system, and he thought the adoption of the metric system might have the effect of inducing medical men to write prescriptions more legibly.

The PRESIDENT here interposed to ask speakers to confine their attention to the terms of the motion, and he suggested that the question whether the introduction of the metric system into the British Pharmacopœia is desirable was really outside the motion. Mr. MARTIN, agreeing generally with that view, thought the subject would be a good one for discussion at an evening meeting, but until Parliament decides upon adopting the metric system, and the Medical Council authorises its use, it would be an unnecessary complication of the examinations to follow Mr. MARTINDALE'S suggestion. Mr. HILLS partly supported the motion, but thought an alteration of its form would be advisable, though pharmacists should be in advance rather than mere followers of the Medical Council in regard to any system they felt ought to be adopted, especially in the case of a reform likely to be introduced before long. Mr. ALLEN said he had expected to hear arguments in favour of the motion; but he did not believe in the existence of such ignorance of the metric system as had been suggested, and, as he thought the average chemist's assistant would be able in a few months to become thoroughly familiar with its use, he did not see any reason for examining candidates for the qualifying examination upon the metric system until it had been adopted by medical authorities. Mr. HAMPSON supported the motion on the ground that extended use of the metric system is desirable.

The PRESIDENT pointed out that the Council, having no authority to make regulations for the Board of Examiners, that was not the place to discuss the question raised. The difficulties that would be created by examining in two systems of

weights and measures would embarrass candidates as well as examiners. He thought Mr. MARTINDALE'S motion went too far, and suggested that if its principle were adopted, it should be sent as a recommendation to the Board of Examiners to consider. Mr. BOTTLE supported this view, while acknowledging the value of acquaintance with the metric system, and hoping that before long it would be introduced into the British Pharmacopœia. Mr. ATKINS considered that some of the points touched upon might be disregarded as appertaining to a academic discussion. If there was any inconsistency between the requirements of the two examinations that matter was worthy of consideration by the Board of Examiners, and Mr. SCHACHT said that in voting on the motion he should be guided by his view as to its aim being to enable young men to prove their ability to dispense by one system as well as the other.

Eventually at the suggestion of the PRESIDENT, Mr. MARTINDALE agreed to alter the wording of his motion so as to reflect the views of the Council, and it was carried as a request that the Board of Examiners should consider the subject.

A letter from the Colonial Office asking for any comments the Council might have to make on a law passed by the Legislature of Jamaica for regulating the sale of poison was referred to a committee for consideration. The PRESIDENT read a letter from Mr. FITZHUGH, President of the Nottingham and Notts Chemists' Association, enclosing a resolution expressing approval of the draft Pharmacy Bill, and stating that the Association is prepared to support the Council in the endeavour to get it passed.

The report of the General Purposes Committee gave the results of cases in the hands of the solicitors, and on the recommendation of the Committee, proceedings were ordered to be taken in a number of other instances of infringement of the Pharmacy Acts.

The PRESIDENT reminded the Council that since the last meeting Mr. SAVAGE, a former member of the Council and Vice-President, had died, and with the desire of paying a tribute to his memory he asked the Council to authorise him to write on its behalf, expressing to his widow the sincere regret felt at his decease. The proposition was supported by Mr. ATKINS, in terms expressing high appreciation of Mr. SAVAGE'S character and interest in the Society, and was unanimously agreed to.

ENDOWMENT OF RESEARCH.

With the object of promoting the prosecution of chemical and physical research, a very munificent presentation has been made to the Royal Institution by Dr. LUDWIG MOND, one of the partners in the firm which has successfully established in this country the manufacture of alkali by what is termed the

ammonia process. We have abstracted from the report which appeared in the *Times* of Tuesday last a general statement of the details of Dr. MOND'S gift (see page 4), from which it will be seen that provision is made for giving practical effect to an aspiration long since entertained by FARADAY, but not hitherto practically realisable.

For the information of our readers it may be desirable to state that Dr. MOND is a native of Cassel, in Germany, and that he received his scientific education in that country as a pupil of KOLBE and BUNSEN. Having early directed his attention to the scientific development of manufacturing industry, he was successful in devising an important method of usefully recovering from the waste of alkali works the sulphur it contained, and in carrying out that process he came to England in 1862, where he has since chiefly resided. In 1873 Dr. MOND founded the ammonia soda works of Messrs. BRUNNER, MOND and Co., at Winnington, Cheshire, now the property of a limited liability company, of which he is still managing director.

Besides occupying this important position as a manufacturing chemist, Dr. MOND has always been an enthusiastic investigator, and has in that capacity not only made numerous improvements in the details of the ammonia soda manufacture, and the production of chlorine as a bye-product, but has also devised processes for the manufacture of cyanides, peroxides, the production of ammonia from coal, of hydrogen, and electrical gas batteries. His discovery of a very interesting compound of nickel with carbonic oxide has also furnished means of extracting nickel from its ores and applying it to various useful purposes.

In addition to holding the German scientific degree of Ph.D., Dr. MOND is a fellow of the Royal Society, a Vice-President of the Royal Institution and of the Chemical Society, as well as a past President of the Society of Chemical Industry.

In connection with the advance of chemical science and its application to manufacturing industry, it may be mentioned that this country is already deeply indebted to Germany. It is no less indebted to individual Germans who have assisted in carrying out such applications, and also in establishing systematic scientific education in chemistry. Reference to the names of A. W. VON HOFMANN and C. W. SIEMENS will sufficiently support that statement, and the provision now made by Dr. MOND for organising means of conducting scientific research adds another striking illustration of the fact. Though in no way detracting from the value of the services thus rendered, it is almost humiliating to be compelled to acknowledge that they altogether eclipse any similar attempts on the part of the Government of

this country, or of native representatives of manufacturing industry. A perception of the fact that advanced scientific knowledge is the mainspring of industrial progress has yet to be gained by the majority of the British people. In Germany that fact has long been recognised, and while that country is reaping the fruits of a century's laborious cultivation of chemistry and its promotion by the State, investigation in that as well as other departments of science is still conducted in this country, as of old, more as the pastime of the wealthy than as a national necessity. To the alteration of that condition Dr. MOND's munificent action will contribute largely, and as following up the work of his countryman HOFMANN, it may be expected to produce results which will command the grateful appreciation of all British subjects.

BRITISH PHARMACEUTICAL CONFERENCE.

THE programme of the thirty-first annual meeting of the British Pharmaceutical Conference, to be held at Oxford, under the presidency of Mr. N. H. MARTIN, of Newcastle-on-Tyne, has now been finally arranged and approved by the Executive Committee. On Monday, July 30, there will be a reception by the President and a conversation in Christ Church Hall, by kind permission of the governing body, at 8.30 p.m. An exhibition of scientific instruments, etc., will be supplemented by music and light refreshments. On Tuesday, July 31, at 10 a.m., the Sessions of Conference will be opened in the Hall of Balliol College, by kind permission of the Master and Fellows. After an official welcome by the Mayor (Walter Gray, Esq.) the presidential address will be delivered, and followed by the reading and discussion of papers. At 1 p.m. luncheon will be served at the Randolph Hotel, the Conference headquarters, and at 2 p.m. the Sessions of Conference will be resumed. A garden party will be held in the grounds of New College, by kind permission of the Warden and Fellows, at 4.30 p.m. the same day, and afternoon tea will be served there. On Wednesday, August 1, the business proceedings will follow the same course as on the previous day, the Sessions of Conference being resumed for the last time at 2 p.m., and at 4.15 p.m. visits will be paid to various colleges, the city, etc. Subsequently, the usual smoking concert will be held at the Randolph Hotel, at 9 p.m. On Thursday, August 2, the last day of the Conference, there will be a river excursion to Abingdon, starting from Folly Bridge at 9 a.m. Luncheon will be prepared in the Council Chamber, Abingdon, by kind permission of the Mayor (E. MORLAND, Esq.), at 1.30 p.m., and at 3 p.m. the boats will leave Abingdon. The members will be able to visit Nuneham Park, the seat of AUBREY HARCOURT, Esq., on the return journey,

and at 5 p.m. tea will be ready on board the boats. The arrival at Oxford is expected to take place about 8 p.m. The books of tickets may be obtained of Mr. HENRY MATHEWS, the Honorary Local Secretary, 108, High Street, Oxford, to whom application should be made not later than July 23. Hotel accommodation will also be arranged for by Mr. MATHEWS, if early intimation be sent to him of what is required in that respect. As a trustworthy and up to date handbook for visitors 'Alden's Oxford Guide' is specially recommended by the local committee.

DOCTORS IN SCIENCE.

AMONGST those admitted to the honorary degree of Doctor in Science at Cambridge, on Wednesday, June 27, we omitted last week to record the name of an honorary member of the Pharmaceutical Society, in the person of Professor DEMETRI IVANOVITCH MENDELÉEFF, late of the University of St. Petersburg. The speech delivered on the occasion by the Public Orator (Dr. Sandys) was as follows:—

"In scientia chemica investiganda diu inter peritos quarebatur, quanam ratio interesset inter atomorum pondera e quibus rerum elementa constarent et vires eas, sive chemicas sive physicas, quae elementis ipsis velut propriae inhaerent. Qua in ratione penitus perscrutanda atque ad certam quandam legem redigenda nemo plura perficere existimatur quam vir illustris qui Siberia in remota natus, et undecim abhinc annos a societate regia Londinensi numismate aureo donatus, hodie nostra corona qualicumque decoratur. Magnum profecto est inter tot elementa rationem certis intervallis velut circuitu quodam recurrentem observasse, eque rerum notarum observatione etiam ignota providisse. Viri huiusce ingenio etiam elementa prius inaudita mentis divinatione singulari praedicta sunt posteaque in ipsa rerum natura reperta. Quae elementa, trium gentium nominibus Gallium, Scandium, Germanium nuncupata nomen ipsius illustris reddiderunt et Russorum famam, quantum ad ipsum attinet, feliciter auxerunt. Ergo virum de scientia chemica tam diu tamque praeculare meritum, totque titulis aliunde ornatum, hodie etiam nostrorum

'turba Quiritium

certat tergeminis tollere honoribus.'

Newtoni certe in Academia honores ei praesertim, debetur, qui etiam in scientia chemica Newtoni in vestigiis tam fideliter insistit, ut alumni nostri 'qui genus humanum ingenio superavit' imaginem intuens, Lucreti verba paululum mutata possit usurpare:—
'Te sequor, o Grantae magnum decus, inque tuis nunc Ficta pedum pono pressis vestigia signis.'

We note also that a grace of the Senate of the University of Dublin has been passed, conferring the degree of Doctor in Science upon Mr. DANIEL MORRIS, C.M.G., Assistant-Director of the Royal Gardens, Kew.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, July 4, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT,
MR. WM. GOWEN CROSS, VICE-PRESIDENT,
Messrs. Allen, Atkins, Bottle, Greenish, Gostling,
Hampson, Hills, Martin, Martindale, Schacht, Southall,
and Young.

The minutes of the previous meeting were read and confirmed.

THE INTERNATIONAL CONGRESS OF HYGIENE.

The PRESIDENT moved the appointment of Dr. B. H. Paul as delegate of the Pharmaceutical Society to the International Congress of Hygiene at Buda Pesth. This was seconded by Mr. Hampson, and carried unanimously.

THE NORTH BRITISH BRANCH.

The PRESIDENT said a notification had been received from the Assistant Secretary, Mr. Rutherford Hill, that Mr. J. Laidlaw Ewing had been elected Chairman and Mr. Charles Kerr, Vice-Chairman of the Executive for the ensuing year.

HONORARY AND CORRESPONDING MEMBERS.

The PRESIDENT read a letter from Professor Remington thanking the Society for the honour conferred upon him in electing him an honorary member.

He also read letters from Professor Rusby and Dr. George Watt, thanking the Society for their election as corresponding members.

THE SALTERS SCHOLARSHIP.

The PRESIDENT announced that the Research Committee at a meeting on the preceding day had unanimously nominated Mr. F. H. Carr as Salters' Fellow for the ensuing year. His election would be made by the Court of the Salters' Company in October next. He might mention that Mr. Carr had been selected out of a number of gentlemen with very high qualifications, after very full consideration.

ELECTION OF A MEMBER.

The following, who was in business before August 1, 1868, having tendered the subscription for the current year, was elected a "Member" of the Society:—

Chemist and Druggist.

Lloyd, George Henry Wolverhampton.

ELECTION OF ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Blore, George James Pendleton.

Huggins, Samuel Barnet.

Raffan, John Stirling.

Wright, George Victor Ayr.

ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Donald, James Jameson Newscome.

Gillitt, Albert Ambrose London.

Robertson, Joseph Aberdeen.

ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Andrew, John Reginald London.

Bryant, Nicholas J. Andrew Truro.

Burge, William George St. John's Wood.
Burgess, Sydney Robert Luton.
Green, George Turton Stourbridge.
Hodgson, Baron Cuthbert Halifax.
Hughes, Richard Owen Blaenau Ffestiniog.
Jones, Driver Fitzherbert Devizes.
Jutton, Sidney Arthur Margate.
Kable, Martin Anton Gottfried London.
Martlew, Charles Carlisle.
Miller, Thomas Berwick-on-Tweed.
Mitchell, Henry Searle Truro.
Morrey, George Market Drayton.
Reckless, Walter (jun.) Sheffield.
Robinson, Edward George Lincoln.
Swanson, Alex. J. Robertson Edinburgh.
Topping, Edmund Bury.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

RESTORATION TO THE REGISTER.

The name of the following person was restored to the Register of Chemist and Druggists:—
Jonathan Boor, 62, Denmark Road, Manchester.

REPORT OF THE FINANCE COMMITTEE.

This report was of the usual character, and recommended sundry accounts for payment.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report, saying its special feature was the receipts from an unusually large number of candidates. On the Benevolent Fund account they had received but very few subscriptions, and as to the other items nothing was to be added to the report of the Registrar.

The adoption of the report was seconded and carried.

REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included recommendations of the following grants:—

£12 to the widow (58) of an Associate who died in 1873. In 1874 she had a grant of £10 to assist in educating her children, five of whom are living, two daughters being at home, one consumptive. (Hastings.)

£6 to the widow (63) of a chemist and druggist, who had a grant of £5 in 1883 and £5 in 1891. (Sheffield.)

£10 to a former member (75) and a subscriber to the Benevolent Fund. Applicant has had four previous grants, amounting to £35, the last in 1893. (Hull.)

£7 to a registered chemist and druggist (80) and former subscriber to the Fund. Applicant has had four previous grants, amounting to £26. (Lynn.)

One case was deferred, and two were not entertained.

The VICE-PRESIDENT (as Chairman of the Committee) then moved the adoption of the report, which, he said, called for no special comment, but he should like to say a word with regard to the Orphan Fund. During the last month Mr. Hills and the Secretary went with him to the Watford Orphan Asylum to see the orphan who had been placed in that institution through the instrumentality of the Fund. They were met with every consideration and cordiality, and the general arrangements of the establishment struck them as being everything that could be desired. The cleanliness and order which prevailed throughout were very noticeable, and in themselves formed a most valuable portion of the education which the children received. The little boy was very glad to see them, and seemed to be very happy. An interesting fact which they

ascertained was that it was only through an institution or society that orphans could be received in that establishment by annual payments; a private individual must pay a lump sum to secure the entrance of an orphan. He hoped they would not have many orphans to provide for, but he was very pleased to feel that when such cases did occur they were able to give a thoroughly good start in life to those who were left unprovided for.

Mr. HILLS said he concurred in what the Vice-President had said as to the pleasure with which he and his colleagues regarded the arrangements of the institution, and the care evidently bestowed on the orphans there.

Mr. HAMPTON added a few words, and the report was adopted.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Museum.

The Curator's report had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
May . . .	Morning	450	29	6	16
	Evening	49	6	1	1

Donations to the Museum had been announced (*Pharm. Journ.*, June 16, p. 1053), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
May . . .	Day . .	493	28	7	19
	Evening .	178	13	2	8

	Circulation of Books.	Total.	Town.	Country.	Carriage paid.
May	244	139	105	£1 6s. 4d.	

Donations to the Library had been announced (*Pharm. Journ.*, June 16, p. 1053), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The staff of the Society's school had attended, and reported on the various classes.

An application from the Three Towns and Plymouth District Chemists' Association for a materia medica cabinet was considered, and the Committee recommended that a sum of £20 be granted under similar conditions to those adopted in the case of Chester in February, 1892.

The President was requested to invite Mr. Walter Hills to deliver the Inaugural Sessional Address in October next.

The PRESIDENT, in moving the adoption of the report, said he noted the pleasure with which the members had received the reference to Mr. Hills, and he was glad to be able to add that Mr. Hills had consented to deliver the address.

The report was unanimously agreed to.

APPOINTMENT OF SCHOOL STAFF.

Professor Attfield was re-appointed Professor of Practical Chemistry; Professor Dunstan, Professor of Chemistry; Professor Green, Professor of Botany; Professor Greenish, Professor of Pharmacy; and Mr. Joseph Ince, Lecturer in Pharmacy, for the ensuing session.

METRIC WEIGHTS AND MEASURES.

Mr. MARTINDALE moved:—

"That after the first day of January, 1895, a practical knowledge of the metric system of weights and measures shall be required of all candidates for the Minor Examination in the subjects of Pre-

scriptions and Practical Dispensing, and that the Boards of Examiners be instructed to require from candidates 'a general knowledge of Posology in terms of the metric as well as the British system of weights and measures, as defined by the British Pharmacopoeia, 1885,' and in Practical Dispensing 'to weigh, measure, and compound' by the metric as well as the British system of weights and measures."

He sketched the history of the Society's action in regard to the metric system of weights and measures, saying that although there was some talk of adopting it twenty-eight years ago, it was not made a subject for examination till 1868. In the year following it was required for the Minor Examination, the alterations and new regulations then introduced requiring that candidates in pharmacy should possess a practical knowledge of the metric system. A year or two afterwards the examinations were conducted on this system, but it was carried out only in a limited way, and his experience at the time was that candidates possessed very little practical, as distinguished from theoretical, knowledge of the subject. In 1872, and again in 1874, there were other revisions of their examination requirements, and he suggested a practical examination in dispensing medicines under the metric system, but the President and others tabooed the proposal. However, in 1874, the metric system was transferred to the First Examination, and in the schedule for that year, candidates were required to have a thorough knowledge of the system. He had then pointed out that this "thorough knowledge" proved to be of a superficial kind, and he urged that it should be more practical. The next alteration was in the regulations of 1891, and the subject was still retained. In chemistry and physics, he showed by quoting the regulations, that candidates were expected to possess an elementary knowledge of the metric system of weights and measures; but he thought that something more than elementary knowledge was required when, except in our own country and its dependencies, almost every civilised nation had adopted it. Moreover, he found that the knowledge we required was of a very *dilettante* and not of a practical kind, and when Japan and Chili, Mexico and the United States, and almost every other country except India and our own has adopted the system, it was time we also recognised and carried it into practice. It had been proved to be the most symmetrical and simple in determining minute quantities accurately. Quantities by volume and by weight, especially small quantities, were easily convertible into one another, which was not the case with the weights and measures of the British Pharmacopoeia. The two smallest denominations were the minim and the grain, and in weight there were but three measures—the grain, the ounce, and the pound. But the dose of morphine was from $\frac{1}{4}$ to $\frac{1}{2}$ grain, of strychnine $\frac{1}{16}$ to $\frac{1}{8}$ grain, and of arsenic $\frac{1}{16}$ to $\frac{1}{8}$ grain, so that there were no weights small enough to weigh a single dose. Again, the grain was not an aliquot part of an ounce, and you could not use the *avoirdupois* ounce for many purposes, because it took 437 $\frac{1}{2}$ grains to make the ounce, and you were almost obliged to use the obsolete troy ounce of 480 grains for dispensing purposes. This system seemed too absurd to be continued; it was as if in coinage there were nothing between a penny and a pound, and the pound did not contain a certain number of pence. What were the objections to the introduction of the metric system? It was said that it would cause confusion and lead to mistakes. But on whose part? Was it on the prescribers? If so, pharmacists, knowing the subject thoroughly, would be able to correct them. Before prescribers took the matter up there would be a long period of transition, in which

both systems would go on simultaneously. But he believed the mistakes which were anticipated would be those committed by pharmacists in dispensing, and it was for this reason he wished the system included in the examinations, so that the students should be thoroughly trained in it, and be able to think in it, and recognise unusual doses at once. Until physicians had confidence in pharmacists' knowledge of the metric system they would never prescribe in it. If the system were introduced, it should include both weights and measures, because liquids could be much more accurately measured than weighed. In America the system was coming into use, and had been introduced into the last edition of their pharmacopœia, and he thought it was not creditable to England to be behind in this matter. He much regretted that the editors of the last two editions of the British Pharmacopœia had not been able to introduce the metric system. He had, therefore, brought forward the motion in order that the question might be thoroughly discussed and thrashed out before a new edition was published. The metric system was almost universally employed elsewhere, and pupils who had learned it elsewhere had told him that on having to learn the English system it seemed barbarous in comparison. The conversion of the pharmacopœia proportions into parts, either by weight or by volume, had been the subject of discussion by several professors, and various suggestions had been made from time to time, from 1859 downwards. The late Mr. Peter Squire planned a certain number of equivalents, so as to make the conversion from one system into the other easy and practicable. Subsequently, Professor Atfield suggested the introduction of a grain-measure instead of the minim for dispensing, the fluid-grain being the equivalent of the grain weight of distilled water, but that would not have been an aliquot part of the fluid drachm or fluid ounce, and rather than adopt that he would prefer things to remain as they were. He should oppose any alteration in the value of the minim or the grain, which were the two most important quantities to pharmacists, and he was sorry to say that their equivalents in the metric system were not easily obtained. No doubt there would be a transition period, of from twenty to thirty years perhaps, in which the old system would continue to be employed, but there need be no difficulty about that. The great point was whether the metric system introduced into the pharmacopœia was a proper scale of doses. Some twenty years ago he endeavoured to familiarise medical students with this subject, and in revising the University College Hospital Pharmacopœia in 1873 he put the equivalent doses of medicines in the metric system, and the same plan had since been carried on by Mr. Gerrard. That morning he had received from the President of the American Pharmaceutical Association a letter, in which he enclosed tracings of several prescriptions dispensed in Boston, in some of which metric quantities were named. He noticed that the German system of writing was followed rather than the French, which he thought preferable and more practical. The subject was discussed at the International Pharmaceutical Congress in Chicago, and he hoped Mr. Martin would support his motion to-day, as he had then spoken in favour of the resolution that was passed, to the effect that in the opinion of the Congress the decimal system of measures based on the metre ought to be the only system of measures used in a pharmacopœia, and that fluid measures should be employed in the measurement of liquids. Mr. Martin then said that the metric system was in common use in England amongst scientific men, and if certain difficulties were removed no English pharmacist would be opposed to its introduction into the pharmacopœia. He should be glad to know what

the difficulties were other than disinclination, or he might, perhaps, almost call it laziness. There had been many discussions on this subject at evening meetings and elsewhere, but nothing seemed to come of them, and he therefore brought forward this motion.

Mr. YOUNG seconded the motion. He said most pharmacists had occasionally continental prescriptions to make up, and it was important that both they and their assistants should feel as confident in dealing with them as with those written in the usual style. Mr. Martindale had drawn attention to the fact that England was about the only country that clung to an antiquated system; he knew there were many people who revelled in anything antiquated as opposed to anything modern and useful, but he thought the Pharmaceutical Society, which had of late years appeared to have awoken from its Rip Van Winkle-like sleep, should be the last to oppose any scientific reform. It had been objected that mistakes might arise from the misplacement or omission of a decimal point, but there were equal dangers in the present system from confusion between the mark for the ounce and the drachm. At any rate, if this system were introduced it might have a good influence on the medical profession, which might rise to the necessity of writing legibly and using correct Latin.

The PRESIDENT said he must ask gentlemen to confine their attention to the terms of the motion. He did not like to interrupt the proposer, though a large part of his speech was devoted to matter which would have been very suitable to an evening meeting, but was entirely beside the subject of the motion. The question of whether the introduction of the metric system into the British Pharmacopœia was desirable was really quite outside the motion.

Mr. MARTIN said he agreed generally with the views of the President. He thought the subject would be a good one for a paper, and more suitable than for a meeting of this kind. The House of Commons, it seemed to him, should first be approached, with a view to the introduction of the metric system into this country. Until the Medical Council had adopted it he did not see how they could reasonably impose it upon candidates in pharmacy. As to the suggestion that the system prevailed so slightly in the pharmacies of the United Kingdom, that fact would seem to show that it was not required. Until it was more or less authoritatively adopted in the country he did not see why they need enforce it further than was now done, though he was not sorry they had had a discussion on a subject of which they would probably hear more rather than less in the future.

Mr. HILLS supported Mr. Martindale to a certain extent, but thought it would perhaps be advisable to alter the form of the motion. Still, he thought they should be in advance rather than mere followers, and not wait for the Medical Council or any other body to introduce a system which they, as pharmacists, felt ought to be adopted. Assuming Mr. Martindale's view as to the requirements in the examinations to be correct, they seemed to him to be somewhat contradictory. However that might be, he considered that as all knowledge was power, they should be well in advance of probable needs, and make such judicious regulations as would be calculated to anticipate rather than be in the rear of a reform, which he could not doubt would, before many years were past, be adopted in England.

Mr. ALLEN said he had looked forward to this discussion with considerable interest, expecting to hear some arguments which would enable them to decide whether or not they should vote for the motion. He was not prepared to admit the preva-

lence of such comparative ignorance in respect to the metric system as had been hinted at, and Mr. Martindale's own arguments, he thought, tended to show that the Pharmaceutical Society had, down to the present time, shown its appreciation of the position by enforcing on candidates some knowledge of the system. If the difference prevailed between the Preliminary and the Minor Examinations which had been spoken of, he thought a remedy should be provided. He had, however, such belief in the power of the average young men now coming forward as pharmacists that, apart from the meaning of what was "thorough" knowledge, should the metric system be introduced into the pharmacopœia, he had no hesitation in believing that a few months only would be required to make the average chemist's assistant throughout the kingdom thoroughly familiar with it. Until the medical authorities had given us a national pharmacopœia, embracing the metric system, he did not see any reason for examining candidates for the qualifying examination in the system.

Mr. HAMPTON supported the motion, and thought the existing requirement of some knowledge of the system was an argument in favour of its extension and making it more practical.

The PRESIDENT said he, too, was strongly impressed with some of the views which had been advanced, but he desired to brush away a good deal of what had been theoretical in their deliberations in order to come to the practical portion of Mr. Martindale's suggestions. He would remind the Council that it had no authority to make regulations for the Board of Examiners, and he doubted whether this was the best place at which to discuss such a question, but he assumed that any recommendation the Council might make would receive every attention from the Board. He took it that the general system of education for the profession was now so cosmopolitan and general that, supposing the introduction of the metric system of weights and measures should be advisable, any ordinary schoolboy of average capacity could be put through the course in a very short time. To those not instructed in the system of grammes and centigrammes he apprehended it would be no easy thing in the throes of an examination to compare them with English weights; but he suspected that a fair majority of those who sat as candidates in the examinations of the Society had done more or less practical work in the metric system, and therefore for the purposes to which it would ordinarily be applicable they would know the difference between the two. The point now, as he understood it, was, were they to carry this farther and make the metric system somewhat of the nature of a specific subject. For himself, he had no objection to a week being devoted to examination; but if they decided on adopting Mr. Martindale's views, the Board of Examiners would probably ask how it was to be carried out. If the motion were to be adopted the examiners would have to test candidates in the national as well as in the metric system. They might then find it necessary, for want of time, to leave out one of them, and the question was, which of them? These were practical considerations which he thought the Council should anticipate in any decision to which it might come. Then, in the question of posology, it seemed to him the examinations were already sufficiently searching without making any addition to them. Thinking that Mr. Martindale's motion went too far, he suggested that it would be better, if its principle were adopted, to send it to the Board of Examiners as a recommendation, and ask it for an opinion thereon, and how far it could be carried out. The question of principle, whether or no it should be introduced, might be discussed there; but the way in which it

could be practically applied he thought must, after all, come before the body responsible for its administration and application. He protested against the idea that they were to "grow" men for particular mechanical operations; rather what they wanted was all-round educated men, with a capacity for absorbing and working out new ideas such as were embodied in the resolution. The function of the Society was primarily the protection of the public in providing that the men who dispensed their medicines should understand the subject; a question like that under consideration was entirely subsidiary and secondary to this. As to the argument of the Society being in advance, he did not think Mr. Martindale's motion would have the slightest effect upon the medical profession, whilst from the examination point of view he thought it impracticable, if not unduly adding to the burdens and difficulties of candidates. He spoke as an examiner, and he thought Mr. Martindale would be the first if he had a boy of his own under examination to recognise the justice of the remark. Education of the kind wanted could only be attained slowly and by degrees; and should the motion be carried, he earnestly counselled its reference to the Board of Examiners.

Mr. HILLS suggested that perhaps Mr. Martindale would alter his motion in that respect to meet the views of the President, in which he thought there was some force.

Mr. BOTTLE spoke in the same spirit. It was not for the Council to initiate regulations for the Board of Examiners, but it might submit its ideas to that body for approval or suggestion, and that, he thought, would be a step in the right direction. As practical men he thought they must acknowledge the value of some acquaintance with the metric not less than their own national system, and he hoped the time was not far distant when they should see the metric system of weights and measures introduced into the British Pharmacopœia.

Mr. ATKINS said he would not attempt to decide between the various theories put forward in the discussion, but he regarded as at least singular and novel the difference between the two examinations, bearing on acquaintance with the metric system, and that this was a matter well worthy of consideration. Anyhow, he hoped the question would not be dealt with in a summary way to-day, but passed on to the Board of Examiners for consideration and report. He thought the metric system contained some points of great advantage, not least among them being its universality on the Continent; and he mentioned a case of a young friend who, having settled down in a small pharmacy which had been neglected, had been encouraged and enabled to build up a decent practice through the discovery by two ladies of eminence in the place that, to their delight and satisfaction, not less than their astonishment, he was able to dispense a prescription in the measures which they placed before him.

The PRESIDENT expressed his opinion that the practical meaning of the word "thorough" in the requirements of their examiners was well understood, as being designed rather to test the candidate's general idea of a system not generally used in this country than as indicating a very deep knowledge of its possibilities and capacities.

Mr. SCHAUCHT said he should be guided in his vote on the question according as he understood that its aim was to provide for young men in case of need proving themselves as well able to dispense under one system as under the other.

Mr. MARTINDALE, to meet the obvious feeling of the Council, expressed his willingness to make his

motion read that the Council suggests the desirability of requiring a practical knowledge, etc.

The PRESIDENT suggested that the practicability or advisability of the course suggested should be referred to the Board of Examiners.

Mr. MARTINDALE said he would word his motion in any form that might be thought most advisable for reflecting the spirit of the Council. It was eventually decided that the motion should read as follows, and in this form it was put to the meeting, and carried :—

"That the Boards of Examiners be requested to consider the desirability of requiring a practical knowledge of the metric system of weights and measures of all candidates for the Minor Examination."

It was resolved on the motion of the President that the Board of Examiners be empowered to receive in the case of Mr. J. M. Ricardou the certificate of the University of France, in lieu of the First Examination.

LETTER FROM MR. G. W. SARGENT.

The PRESIDENT read a letter which had been received from Mr. G. W. Sargent, in reply to one sent him by the Secretary in pursuance of the resolution of the Council at its last meeting, asking for an explanation of his conduct in writing to the goods manager of the South-Eastern Railway Company at Gravesend, reflecting on the conduct of the Local Secretary for Gravesend. Mr. Sargent said in his letter that as "a chemist, citizen, or insurance agent," he had a perfect right to draw attention to the "Revenue, Explosives, and other Acts." He moved that the Council consider Mr. Sargent's reply unsatisfactory, and that two members of the Council be deputed to communicate with him in accordance with the Bye-laws, section XVII, subsection 2, and report to the next meeting of the Council.

This was unanimously agreed to.

THE PHARMACEUTICAL CONFERENCE.

The President, Vice-President, Treasurer, and Messrs. Atkins, Bottle, Gostling, Grose, Hills, Martin, Martindale, Schacht, Southall, and Young were appointed delegates to the British Pharmaceutical Conference meeting at Oxford. The Secretary, Editor, and Sub-Editor were also requested to attend.

PHARMACY IN JAMAICA.

The PRESIDENT said a letter had been received from the Colonial Office enclosing a copy of an Act passed by the Legislature in Jamaica for regulating the sale of drugs and poisons, and asking for any observations the Council might have to make upon it. He would move that the letter and enclosure be referred to the Library, Museum, and School Committee for consideration.

This was unanimously agreed to.

THE DRAFT PHARMACY BILL.

The PRESIDENT read a letter which had been received from Mr. FitzHugh, President of the Nottingham and Nottingham Chemists' Association, enclosing a resolution approving of the draft Pharmacy Bill, and saying that the Association was prepared to support the Council in its efforts to get the Bill passed into law.

GENERAL PURPOSES COMMITTEE.

The report of this Committee, which was as usual read and considered in committee, included a letter from the solicitors with regard to legal cases placed in their hands. A number of fresh cases of infringement of the Pharmacy Acts were reported to the Committee, and proceedings were recommended.

On resuming, the report and recommendations were unanimously adopted, and a special resolution was passed authorising the Registrar to take proceedings against the persons named.

THE LATE MR. SAVAGE.

After the reporters had left, the PRESIDENT

said he had unfortunately omitted, before concluding the ordinary proceedings, to pay a tribute to the memory of a past member of the Council for many years, and a former Vice-President of the Council, who was for many years an active pharmacist, and whose whole life was, he might say, gladdened by his association with the Council. He referred to Mr. William Dawson Savage, who had died since their last meeting. As President, he had already sent a card of condolence to his aged widow, and he would ask the authority of the Council to send a letter in its name expressing the sincere regret which they all felt at his decease, also their satisfaction that he was able to live a long life, and to live it well. He might also be allowed to say that in the persons of his sons, one a pharmacist, and another a distinguished medical man, the name of Savage was never likely to lose the respect which their late friend had secured for it.

Mr. ATKINS said he should like to support this proposition. In common with several of the older members of the Council he claimed the honour of an intimate friendship with the late Mr. Savage; he had stayed at his house on several occasions, and knew his domestic life. A more charming life he had never met with, and he was sure that the expression of regret and sympathy which the President asked their authority to send would be received by the lady who survived him, and who was deeply attached to him, with very great pleasure. He was an exceptionally bright and cheery man, and the extreme youthfulness of his manner and mind at his advanced age was quite marvellous. It was remarkable the interest he took in the work of the Society and of the British Association, at whose meetings for many years he was a constant attendant, and if any one wanted a minute reproduction of the transactions of the Society he would find it in the carefully annotated records which Mr. Savage preserved.

The suggestion of the President was unanimously agreed to.

AUGUST COUNCIL MEETING.

It was resolved that the next meeting of Council be held on August 8 instead of August 1.

MEETING OF THE EXECUTIVE OF THE NORTH BRITISH BRANCH.

A meeting of the Executive of the North British Branch was held in the Society's House, 36, York Place, Edinburgh, on Thursday, June 28, at 12, noon, Mr. J. Laidlaw Ewing in the chair.

Present — Messrs. Currie, Glasgow; Davidson, Montrose; Ewing, Gibson, Henry, Lunan, and Noble, Edinburgh; Fisher, Dunfermline; Johnston, Paterson, and Strachan, Aberdeen; Kerr, Dundee; Nesbit, Portobello; and Sutherland, Dumfries.

Apologies for absence were received from Messrs. Hardie, Dundee; Kinninmont and McAdam, Glasgow; and Storrar, Kirkcaldy.

The minutes of last meeting were read and approved. The Chairman intimated that the first business was the election of a Chairman for the ensuing year.

Mr. Johnston moved that Mr. Ewing be re-elected for another year. He was sure it was their unanimous opinion that no better Chairman could be found. During the last two years he had been associated with Mr. Ewing as a member of the Executive, and had found him always able and agreeable in the discharge of his duties. In re-electing him there could be no doubt they were doing the best in their own interest, and for furthering the interests of the Society and the business of the North British Branch.

Mr. Currie said he had much pleasure in seconding the motion. Mr. Ewing's administration had been a marked success, and the state of the poll at the last

election showed that he still retained the full confidence of the Society. The motion was unanimously agreed to.

Mr. Ewing, in replying, said he was much indebted to them for this renewed expression of confidence, and had to thank Messrs. Johnston and Currie for the kind terms in which they had spoken, though he thought their references to his services were too flattering. His own feeling was that he should have retired at this time, but he was willing to agree to what he understood was a general wish. He had at their request taken in hand the superintendence of the new building operations, and he would endeavour to see the work successfully carried through. He would continue to serve the Society to the best of his ability, as he had hitherto done.

Mr. Paterson moved that Mr. Charles Kerr, Dundee, be re-elected Vice-Chairman.

Mr. Sutherland seconded the motion, which was unanimously agreed to.

Mr. Kerr, in reply, thanked the members for his re-appointment, but said he only accepted on the understanding that he should retire at the end of the year, as these honours should go round. His duties had been very light, and it was a pleasure to him to be of service to the Society in any way.

The Chairman, Vice-Chairman, and resident members were appointed a General Purposes Committee to take charge of any business arising between meetings.

The Executive adjourned for a few minutes to inspect the new buildings, under the direction of the clerk of works. On resuming, the Chairman explained that an estimate for provisional fittings for electric lighting by Mr. Buchan, electrical engineer, amounting to £30, had been accepted. A temporary insurance for £1000 until Martinmas had also been effected. It was expected that the new premises would be ready for occupation towards the end of October, when it was proposed to have a formal opening. Some suggestions as to details were made by members of the Executive, and these and all other arrangements were remitted to the General Purposes Committee, with powers.

It was remitted to the General Purposes Committee to make arrangements for evening scientific meetings in Edinburgh during the winter months.

The Chairman said the next item of business was one of some importance. He thought it very desirable that the Executive should consider the method of nominating examiners, and should come to some definite arrangement. This was a subject that would probably require careful attention in the near future, and he would suggest that they might appoint a small special committee to deal with it and take what steps might be found necessary. They might have observed that a similar proposal had been made in regard to the Council in London. He would therefore propose that they remit this matter to a committee, consisting of the Chairman and Vice-Chairman, the Scottish members of Council, Messrs. Currie, Glasgow; Ker-math, St. Andrews; Nesbit, Portobello; and Strachan, Aberdeen.

Mr. Paterson said he would like to ask Mr. Johnston who were meant to be appointed under the new rule as to outside teachers.

Mr. Johnston said it was intended to appoint those who were daily engaged in the teaching of the respective sciences, and who were recognised teachers in connection with public universities or colleges. It was thought that they would be specially qualified for such work, in respect that their knowledge would be fresher, and that they would be more intimately acquainted with the new ways of teaching. It was well known that, no matter how well up an ordinary pharmacist might be, he was apt to become a little old style in a dozen years or so, and it was

expected that the new plan would tend to obviate anything of that kind.

Mr. Gibson said he would like to ask how the candidates were to be educated up to the standard which would be required by the new examiners.

Mr. Johnston said he thought there would be no difficulty in the case of students in such places as Edinburgh. Those in country districts would no doubt require to adopt some plan by which they could go to places where they could attend classes. But he did not think the new scheme would make any change in the present conditions, as the examinations would remain very much as they were. The rotation plan was a great improvement, but no doubt those who retired would frequently be re-appointed after the lapse of a year, so that, in point of fact, the boards and the examinations would, in his opinion, be very similar to what they were at the present time. There were very good reasons for making the proposed changes, but these he need not enter upon now.

Mr. Nesbit asked if the outside examiners would examine in more than one subject.

Mr. Johnston said the plan was that there would be a different examiner for each of the two subjects, botany and chemistry.

Mr. Gibson said he saw no necessity for these outside examiners at all. He thought they were not at all fit persons to examine pharmaceutical students. What they wanted was good all-round men with a practical knowledge of pharmacy, and not scientific specialists. He entirely objected to the introduction of outsiders in the manner proposed.

Mr. Paterson said he thought the new scheme was a very serious proposal, and ought to be very fully considered. In medicine it was different, because there they had already compulsory classes. But it was a widely prevalent belief that if a certain teacher happened to be also an examiner it was necessary to attend his class, even when it was an extra class, or they would not pass. He was afraid something of the same kind might happen under the new plan, and their candidates would thus require to spend more time and money on their classes. He thought this proposal was a retrograde step, because the Society had not yet instituted any classes, except in London, which students could attend, and until they did so he thought it would not be judicious to alter the present plan. He rather thought their young men would fare better at the hands of the present examiners than at those of the outsiders. Until they had reached a more advanced stage he did not think the change would be a good thing. He was surprised to hear a proposal to appoint professors as outside examiners, because he thought that last year they were insisting that all-round men were what they wanted.

Mr. Lunan seconded the Chairman's motion. He thought the new plan would be an improvement. He differed from Mr. Paterson and Mr. Gibson, and thought the outside examiners might very probably be easier, and would not exact the same amount of detail knowledge that was sometimes demanded by the present examiners.

The Chairman said this was a matter that had demanded the very serious attention of the Council, and in which it had been felt absolutely necessary to make some new arrangement. It was quite possible that had the Council not voluntarily adopted the new scheme it might have been imposed by a power which was behind the Council.

Mr. Sutherland said he was quite sure the new plan would not impose any hardship on the students, but he believed it would rather be acceptable to them than otherwise. The fact was that they had been asking for something of this kind for a considerable time.

The Chairman's motion was then agreed to unanimously.

The Chairman then explained, in reply to an inquiry, that the Council had found it necessary to make a regulation that notice forms for the First examination should be obtainable only from the Secretary.

The Chairman also reported the result of his inquiry as to the sale of such preparations as Easton's and Fellows' syrups, and directed attention to the passage on this point in the President's speech at the last annual meeting in London. That he recommended, as a guide in dealing with such cases.

Mr. Lunan said he wished to give notice that at the next meeting he would move a resolution recommending the Council to consider the desirability of enlarging the Journal. He had no fault to find with the Journal as a record of transactions, but he thought something might be done by the addition of dispensing memoranda and notes and queries, or otherwise, to make it more popular. In many parts of the country the Journal was looked upon as all they got for their annual subscription, and there was a very general desire to see it made more popular. He gave notice now in order that they might consider the matter, and perhaps get the opinions of their constituents as to what could be done to make the Journal more attractive.

Mr. Currie said this was the first meeting of Executive since the decision of the High Court in the Tomlinson appeal case, and he would like to say that it had given much satisfaction among registered chemists in Glasgow. The law in Scotland as affecting open surgeries or drug shops was now perfectly clear, and it was plain that these could not be conducted by unqualified assistants, as had hitherto been the case. The Society's officers would now find it much easier to enforce the provisions of the Pharmacy Act, and it was to be hoped this would be steadily and fully done. Unfortunately, as was well known, the opinion of some of the leading pharmacists in Glasgow did not coincide with that of the High Court, but he was sure the trade generally in Glasgow would give the Society every support in carrying out the law.

The Chairman said he was sure the recent decision was a matter of much satisfaction to them all. Those in Glasgow could aid by giving information of offences and preserving a judicious reticence as to the operations of the Society's officers. He trusted the decision would do much in helping those who were endeavouring to improve the status of pharmacy in Glasgow.

The Chairman and Vice-Chairman, and Messrs. Currie, Gibson, Davidson, and Lunan were appointed delegates to attend the meeting of the British Pharmaceutical Conference at Oxford. The meeting then closed.

Proceedings of Societies in London.

WESTERN CHEMISTS' ASSOCIATION OF LONDON.

At a meeting of this Association, held on June 20, the President in the chair, a discussion took place on the proposed alteration in the method of electing annuitants to the Pharmaceutical Benevolent Fund.

Mr. R. H. Parker (Vice-President), in introducing the discussion, drew particular attention to the suggested abolition of the voting papers. The alleged disadvantages of the present system were first considered.

1. That the voting paper system gave the opportunity for canvassing and advertising appeals on behalf of special candidates, thereby placing at a disadvantage the most needy cases who had neither money nor influential assistance; consequently those who had any funds at all feel compelled to sacrifice

their scant resources for electioneering purposes in order to stand a good chance of success.

2. That the Benevolent Fund Committee, having carefully investigated each case, are much more capable judges of their relative merits than the subscribers would be.

3. That the publicity attached to the system is unkind to the candidates.

The possible objections to the alternative system of electing candidates privately by the investigating committee were next alluded to.

1. The Committee would find it difficult to carry out the highest ethical ideal of true benevolence, their judgment might be warped by personal sympathy, and would be open to the suspicion of favouritism, especially as regards previous membership of the Pharmaceutical Society.

2. The abolition of the voting paper would be like stopping an advertisement.

3. The average subscriber likes to receive a voting paper, and its disappearance may signalise cessation of a great many subscriptions.

Reviewing the whole question, Mr. Parker considered that the voting paper system was to be preferred (if modified according to the suggestions embodied in the resolution he would propose), because:—

1. The Committee need only select as approved candidates those whose merits they considered equal; if any year these should not exceed the number of vacancies, there would be no voting.

2. If the equally meritorious cases exceed the vacancies, then an election by subscribers' votes would be quite free from suspicion of favouritism.

3. Urgent cases unsuccessful one year may be immediately assisted in a substantial manner from the Casual Fund, and are fairly certain of success at the next election by the cumulative feature of the voting paper system, and all cases once approved have an increased chance each year.

Finally, if the candidates' names be not published (the list appearing on the Voting Paper under letters or numbers), and if the Council openly discourage canvassing, the objections on these grounds would not apply; he would therefore submit to the meeting the following resolution:—

"That this meeting of the Western Chemists' Association considers that the election of Benevolent Fund annuitants should be conducted as heretofore by the issue of voting papers to the subscribers, except as regards the publication of the names of the candidates, these being replaced by letters or numbers; also, that a notice should appear on the voting paper calling attention to the possible unfairness of canvassing, cards, and advertisements, and urging each subscriber to vote independently upon the official description of the case."

Mr. Marsh seconded the resolution, and said he much approved of the proposition to substitute letters or numbers in place of the candidates' names, as he thought it would spare them much unnecessary pain, as having their names published with details of their cases must be very harrowing to their feelings.

Mr. Hyslop said he must oppose the resolution, as he felt that the election of candidates could be carried out on a much fairer basis by selection by a committee appointed for the purpose.

Mr. Taplow and Mr. Busby spoke in favour of the resolution, more especially as regards the omission of the candidates' names from the voting papers.

The President, having said a few words in favour of the resolution, put the same to the meeting, when it was carried by a majority of ten to one.

The meeting then terminated, the next meeting of the Association being announced for the third Wednesday in October.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

A general meeting of this Association was held on Thursday, June 28, Mr. W. L. Currie presiding, when several matters of importance to pharmacists came under consideration. The recent decision regarding the sale of poisons was the first subject to be brought up. The President said that up till now the absolute dispensing of poisons by registered men had not been considered necessary, but the decision in the appeal court showed that it behoved them as registered men to look to their position. It was clear that things could not be allowed to go on as they had been going. What were they to do in Glasgow, where there are so many doctors' shops? It came to this, that new regulations would have to be made so as to keep registered men from being held up to the public as the worst transgressors. Where a qualified assistant was not kept, suppose the principal leaves the shop, poisons should not be dispensed by an unqualified assistant. Mr. Russell considered that the decision settled once for all who was the seller of a poison. But the enforcement of the Pharmacy Act might be a hardship if it could not reach all offenders, and he again suggested the plan of having a list of all drug shops in the city arranged, to show under what conditions each shop was kept, and how many qualified assistants were employed in each. After some desultory talk about doctors' servants dispensing in private surgeries, the sale of Easton's syrup and Fellows' syrup was taken into consideration. A side issue, however, cropped up in connection with Fellows' syrup in relation to the medicine stamp, when it was laid down as the dictum of the Board of Inland Revenue that no proprietary medicine such as the syrup in question, or chlorodyne, or "lactopeptine," could be sold alone, whether by prescription or not, without having a medicine stamp attached to the bottle or packet.

The President mentioned two alternatives to adopt in the sale—either to enter it in the prescription book with the name of the purchaser, putting a number on the label, or let it be sold as a preparation of strychnine under the first part of the schedule of poisons, to be registered in the poison book with the signature and address of purchaser.

Mr. D. S. Robertson moved that the plan of entering in the prescription book should be adopted. Mr. McCowan, Paisley, seconded it as the easiest way out of the difficulty.

Mr. Laing moved an amendment that it be labelled poison, and have the dose stated, with the name and address of the seller. Mr. A. McKellar seconded. On being put to the vote, three voted for the amendment and four for the motion, the majority abstaining from voting. The motion, however, was accepted as a suggestion all members were expected to adopt. The draft Pharmacy Act Amendment Bill then came to be considered, when Mr. D. S. Robertson moved that it should be accepted as it stood, and efforts made to strengthen the hands of the Pharmaceutical Society. Mr. McCowan seconded. An amendment, that there should be no limit nor distinction between pharmaceutical chemists and chemists and druggists in eligibility for election to the Council was moved, but found no seconder. The motion consequently became the finding of the meeting, and was received with applause. The President advised members to wait until the Bill was in Parliament, when suggested alterations could be considered in committee, as the

great mistake was preventing bills from reaching the House by blocking them. He then called upon Mr. J. Anderson Russell to bring forward his motion. Mr. Russell said:—

Mr. Chairman and Gentlemen,—My object in asking your careful consideration and opinion of the subject of this motion is to promote a discussion throughout the trade, in the hope and expectation that thereby a good understanding shall be arrived at as to the positions pharmacy and pharmacists should occupy, and that then detailed regulations may be submitted to and endorsed by our Legislature to ensure to them that position.

There is so little time at our disposal to-night that I must not say so much in support of the motion as I might have done otherwise, but I hope to be able on a future occasion, if called upon, to deal with the subject more in detail, and to answer any objections which may be urged either in our own Association or elsewhere.

The fitness of the phrase "Pharmacists for Pharmacy and Pharmacy for the Community" is so evident that no explanation should be required; nevertheless, in practice and in aim the false idea of "Pharmacy for Pharmacists," is so generally adopted as a guide that I feel compelled to emphasise the difference between the two views. I appeal to you to bear in mind throughout this discussion the absolute necessity of maintaining before you the special purposes for which pharmacy exists. We should realise that it is nothing short of political and moral insanity to have incompetent persons attempting to carry out that purpose, while specially trained and capable persons are thereby to a great extent prevented from exercising their special functions.

That is wherein the Pharmacy Act of 1868 fails to accomplish what is evidently its aim, for it is a fact that, though it requires proofs of competence from persons "known as chemists and druggists," any person, however ignorant, may quite lawfully enter upon that business, provided that he does not assume the title, and that he steers clear of scheduled poisons.

The only good reasons for employing inadequately trained persons at all in work such as ours are the want of a sufficient number of trained persons to accomplish it, and the necessity of training. Even then they should be under supervision.

Thus far, gentlemen, I think you must be with me, and if the clauses of this motion appear to you calculated to secure that very proper condition, you must approve of them. You have no alternative.

In addition to competence, the great trust confided in pharmacists demands that they shall be conscientious, trustworthy persons.

We cannot create or guarantee moral worth by any amount of legislation, but we may and should suppress flagrant abuse of privileges and immoral doings by punishment of offenders or by taking away those privileges.

In this motion there is submitted a plan for the suppression of doings considered by the pharmaceutical body detrimental to pharmacy and dishonouring to pharmacists, and if the arrangement appears to you calculated to accomplish what I have just indicated, again I say you must approve of it; you have no alternative.

For the application of laws to any body in the community individual registration is necessary in order to identify its members. It would be inaccurate to say that our present system of registration embraces within it all persons engaged in pharmacy; it only includes those whom we call "qualified."

Therefore any laws made to apply to pharmacists would not under our present system apply to those whom we call "unqualified" and they would be quite inadequate to regulate pharmacy. The terms "qualified" and "unqualified" are not good for describing the persons intended.

I have selected the terms "graduate" and "under-graduate" as being more distinctive. I have no desire to multiply titles, however; the words are only descriptive. You must understand to be meant the persons whom the words describe, call them by what name you may.

In the event of a register being kept of all persons engaged in pharmacy, each individual could then be made subject to pharmacy law, and his position would be as the law decreed.

The registration of open shops would greatly facilitate the full enforcement of the law, which at present is a matter of extreme difficulty and well-nigh impossible. Since all engaged in pharmacy would be interested in and benefited by its laws and regulations, it is but just that all should contribute to the support of its government. My line of reasoning would lead to the conclusion that the community should support it, but if pharmacists do so first, the section of the community benefited will do so indirectly. It is but fair and equitable also that all should enjoy the whole privileges obtainable, and should therefore form part of the Pharmaceutical Society, which would then represent all persons engaged in pharmacy.

For the purposes of the fourth clause there is difficulty in precisely defining the province of pharmacy in a single phrase.

The phrase "compounding or distributing" is more comprehensive than "compounding or selling," and the phrase "excepting under certain specified circumstances" provides sufficient latitude, when you come to details, for correcting what is defective in the definition.

"Selling" might also be included.

If a more suitable definition can be found, well and good. Remember, this is not the text of a pharmacy bill, but the basis on which to build one.

In restricting the compounding and distributing of medicines, or the supervision of those acts to registered graduates, the only personal effect upon them would be extension of their privileges, and nothing personal could possibly be detracted from them by the suggested altered position of the undergraduates. Undergraduates would be placed in relation to medicines in general practically in the same position they now occupy in relation to scheduled poisons, but they would have privileges beyond the ordinary public, whilst at present they have none.

It is necessary to limit the power of supervision in order that it may be a reality and not a farce.

I am of opinion that an undergraduate should have passed the First examination before being registered, and that he should be aiming at becoming a graduate.

In making these alterations a concession might be necessary, as in former enactments, in order to allow unqualified persons at present engaged in pharmacy to continue doing that which is at present legal for them to do.

The motion contains no reference whatever to the First examination or to a concession. Those are matters to be dealt with in working out details, and I comment upon them now simply to show that certain alternatives are not incompatible with the intention of these clauses.

If it be provided for the sake of pharmacy that it shall be conducted by pharmacists only, it necessarily follows that pharmacists shall have a monopoly of

that business. We cannot prevent that. It is a result, however, which I think no pharmacist will object to, and every reasonable person will at once admit the justice of it.

In the fifth clause, the Pharmaceutical Society is named as the proper body to control the conduct of pharmacists. At present I know of no person or body more suitable for that purpose. Of course, every safeguard would have to be provided that justice might be done to alleged offenders.

The increasing and highly beneficial influence resulting from the control exercised by the General Medical Council over the conduct of medical practitioners presents an argument of fact, in favour of granting similar power to the Pharmaceutical Society, more than equal to any theory I could submit.

In pharmacy under these regulations it would be even more effective.

That there is room for its exercise must be patent to all observers.

Here, again, note the necessity of all persons engaged in pharmacy being registered, for without that, disciplinary measures would lose their force and value.

The provision of the sixth clause is necessary in order to enforce the regulations in those preceding.

Having endeavoured to make the motion as clear as possible, and having, I trust, convinced you of its desirability, I now move—

That the members of the Glasgow and West of Scotland Pharmaceutical Association, taking as a watchword, not "Pharmacy for Pharmacists," but "Pharmacists for Pharmacy, and Pharmacy for the Community" (these being the relative positions each should occupy), consider it most desirable in pursuance of that aim:—

1. That all persons engaged in pharmacy be registered, separate registers being kept of "graduates" and "undergraduates," registration to be equal to membership, associateship, or apprenticeship of the Pharmaceutical Society.
2. That all open shops for the sale of drugs be registered.
3. That registration be maintained under an annual licensing fee.
4. That medicines be compounded or distributed by registered graduates only, or by registered undergraduates under the supervision of a registered graduate, excepting under certain specified circumstances; a limit to be placed on individual power of supervision.
5. That the Pharmaceutical Society be empowered to exercise control over the conduct of its licensees, even to removal of names from the registers if need be.
6. That breach of the second or fourth of these clauses shall constitute a penal offence.

Mr. D. S. Robertson seconded the resolution, not altogether in detail, but as considering that the principle was good. Mr. Laing congratulated Mr. Russell on the fruits of his mind, and said if the question of limited liability companies was to be dealt with, this motion indicated the only practical way. If pharmacy was to be kept from that sphere of degrading money-grubbing competition, which was the curse of the age, the motion offered the only way. The President, while congratulating Mr. Russell on his effort, desired to emphasise the fact that the motion had not been adopted altogether by the Association, but, owing to the lateness of the hour, its further consideration necessitated an adjournment of the discussion. The election of a district secretary for the north-east was left in the hands of the council, and the meeting closed.

ABERDEEN AND NORTH OF SCOTLAND SOCIETY OF CHEMISTS AND DRUGGISTS.

The annual excursion of this Society took place in beautiful weather on Tuesday, June 26, to Balmoral and Loch Muick, about thirty members and friends leaving Aberdeen by the Deeside train for Ballater at 8 a.m. Arrived at Ballater the company proceeded in brakes by the Braemar road to Balmoral, where they were met by Her Majesty's Commissioner, Dr. Profett, who, having obtained special permission from Her Majesty, conducted the party over the grounds, through the castle, the garden, the stables, and the dairy. Before leaving Balmoral the President of the Society, Mr. Johnston, expressed the most grateful thanks of the party to Her Majesty, and their congratulations on the birth of another heir to the crown. The return drive was by the new road over the hills to Altnaguisach, from which there is a magnificent view of the castle and grounds of Balmoral, with the snow-clad summits of Cairntoul, Cairngorm, Ben Ann, and Ben Macdhuil filling up the background. Passing almost under the shadow of Lochnagar, the party then proceeded by the Queen's private drive to Glenmuick, and arrived at Ballater about 4 p.m., where dinner was served in MacGregor's Invercauld Arms Hotel, with Mr. Johnston in the chair. After dinner and the loyal toasts, Mr. J. Paterson proposed "The Pharmaceutical Society of Great Britain," and the chairman replied; Mr. Craig proposed "The North British Branch," and Mr. J. Laidlaw Ewing, Chairman of the Executive, replied; Mr. Rutherford Hill proposed "The Aberdeen and North of Scotland Society of Chemists and Druggists," and the Vice-President, Mr. Mortimer, replied. Other toasts followed, and after dinner some of the party climbed the steep ascent to the summit of Craig Chuilach, and were rewarded by a splendid view of the encircling mountains and the valley of the Dee. The company left for Aberdeen at 7.15, and arrived a little after 9 p.m. The arrangements were carried out in a very perfect and successful way by Mr. J. Cruickshank and his committee.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The third botanical excursion of the season took place on Wednesday, June 20, to Colinton Dell, starting by train from Princes Street Station at 8.30 p.m. The weather was fine, and there were about fifty members present, Messrs. W. Duncan and D. McEwan acting as conductors. A large number of specimens were collected, among them being *Aithya cynapium*, *Oxytropis asperius*, *Ruscus aculeatus*, *Sambucus nigra*, *Symphitum officinale*, *Valeriana officinalis* and *V. pyreniaca*. Specimens of the three *Geums*, *G. rivale*, *G. intermedium*, and *G. urbanum* were also found on the spot from which Dr. J. M. Macfarlane obtained the plants used in his research on the morphological relationships between parent plants and hybrids, communicated to the Royal Society of Edinburgh a few years ago.

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

HOSPITAL DISPENSING OF POISONOUS LOTIONS.

On Saturday last Dr. Wynn Westcott held an inquiry at Bethnal Green concerning the death of Harry Francis, 35, a chair maker, 52, Gossett Street. He had not been in good health lately, and had been receiving medicine and a lotion from the City and East London Dispensary, Finsbury. On Monday last,

on returning home about dinner-time, he went up into his room. A few minutes later his sister saw him leaning against the mantelpiece. She said, "What is the matter?" He replied, "I have taken a dose of the lotion in mistake for my medicine." A doctor who was sent for said on arriving that Francis was dead. It was stated that Francis was eccentric, but had never threatened suicide. Both bottles were very similar. The lotion bottle, which was produced in court, had no label, and the coroner remarked that if a chemist had supplied it he would have been liable to prosecution. Dr. Ernest Walters attributed death to poisoning by carbolic lotion. The jury, after passing severe comments on the bottle being sent from the infirmary without any label, returned the following verdict, "That the deceased died from poison taken by misadventure." They requested the coroner to write to the dispensary to the effect that all bottles containing poison should be properly labelled.—*Morning*.

ACCIDENTAL POISONING BY CARBOLIC ACID.

On July 3, an inquest was held at Leeds on the body of James Willans (49), who took a draught from a bottle containing carbolic acid, under the impression that it was port wine. Verdict—"Death from misadventure."—*Yorkshire Post*.

On the same day, an inquest was held at Mansfield, concerning the death of Mathew Hudson (9), who had drunk some carbolic acid sheep dip from a bottle found on the road side, which he supposed to contain porter. Verdict—"Death from misadventure," and the jury suggested that the bottle should have been labelled poison.—*Nottingham Guardian*.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

ADULTERATED PEPPERMINT LOZENGES.

On Wednesday, June 27, at the North Holland (Boston) Petty Sessions, before Dr. Mercer Adam, the Rev. S. Staffurth, the Rev. J. B. Sparrow, Mr. C. T. Tunnard, Mr. S. Waddington, and Mr. R. Gleed, Willen Sharp, grocer, Donington, was charged with having sold peppermint lozenges adulterated with raw potato starch. There were two summonses, the first charging the defendant with having adulterated the lozenges as an article of food, and the second charging him with having adulterated the lozenges as a drug, so as to injuriously affect its quality and potency. Mr. H. Snaith defended. Superintendent Crawford proved the purchase of the lozenges, and Mr. C. H. Southwell, the county analyst, said that the lozenges contained not less than 10 per cent. of raw potato starch. The lozenges of the British Pharmacopoeia consisted of sugar, gum acacia and the medicinal substance they represented. The use of starch would increase the bulk, weight, and the profit, and would take the place of much of the gum acacia. Gum acacia was worth from 1s. 6d. to 5s. a pound, and potato starch was worth less than 1½d. per pound. Raw starch was considered injurious, as tending to induce or to aggravate dyspepsia. Dr. Pilcher also gave evidence in support of the charge, and said that raw potato starch was injurious to health, and would have a depreciating effect on any drug with which it was combined. On behalf of the defendant, Mr. Snaith said he retailed the lozenges as they were supplied to him, and he was ignorant as to what they contained. Defendant said he had never had any complaint before. The magistrates dismissed the case, on the ground that the defendant had acted in ignorance, but cautioned him against selling similar lozenges in the future.—*Lincolnshire Chronicle*.

Reviews and Notices of Books.

A DICTIONARY OF MEDICINE BY VARIOUS WRITERS. Edited by RICHARD QUAIN, Bart., M.D. Lond., LL.D. Ed., F.R.S., assisted by FREDERICK THOMAS ROBERTS, M.D. Lond., B.Sc., and J. MITCHELL BRUCE, M.A. Aberd., M.D. Lond. In two volumes. New Edition. 40s. net. London: Longmans, Green and Co. 1894.

The first edition of this work appeared in 1882. The preface states that it is intended for the use of the practitioner, the teacher, and the student, and it may be added that many of the sections are of interest to the philosopher, whether he be of the medical profession or not; for, comparison of the first with the second edition leads to full appreciation of the great advance that has been made in the course of the last twelve years in the highly complex science of medicine—the mother-science out of which have sprung the roots of many of the most important sciences, such as chemistry and biology.

Scanning the list of contributors to the dictionary it is at once seen that the work is authoritative in the highest degree. In every language there are one or more encyclopædic works which are the just object of national pride. Such are in general literature the lexicon of Samuel Johnson for England, and the great dictionary of Littré for France, and in medicine the great German cyclopædia, edited by Von Ziemmsen, and in England the present work, which does honour not only to Sir Richard Quain and his assistant-editors, but to the medical profession of England, and should be a source of pride to the English-speaking race.

The value of the work to thinkers outside the pale of medicine has already been mentioned, and allusion may be made to some chapters which catch the eye in even a cursory perusal and give profit in the reading. The article on personal health by Dr. Reginald Southey, like many of the sections, appears in the same form in both editions, a striking testimony to the soundness of the original work. It is difficult to refrain from making here a few quotations: "Let us pass from the exercise of the muscles to that of the brain, since here, too, the hygienist may be expected to give a few words of advice as to what is proper and profitable in mental work, and what is improper and likely to prove detrimental to the cerebral organs. Our own experience confirms that of others, that most brains suffer more from rest than overwork.

"Exercise is as essential for the healthy nutrition of the cerebral as it is for that of the muscular tissue; and without regular employment up to the fatigue-point no high quality of intellectual condition is ever attained. Fret, hurry, worry, and the endeavour to accomplish some task in too short a time is what wearies and wears the thinking organ." This brief extract will serve to show that a part at least of this article is to be understood by the laity. Another indicates periods of natural illness, and is of interest to those healthy persons who, in a busy life, think of their physical state only when they feel unable to cope with tasks ordinarily easy to them: "Dr.

Waterhouse notices the three following periods as very important in every human life, as sickly or moulting times. The first he has noticed to befall males chiefly at thirty-six years of age, when the lean person becomes fatter, and the fat leaner. The second sickly period happens at some time between forty-three and fifty, and lasts a year, or perhaps two. During it the complexion fades, the appetite fails, the tongue becomes furred at the slightest over-exertion of body or mind, the muscles are flabby, the joints are weak, sleep is unrefreshing and the spirits droop. It is no particular organ that suffers, but a uniform deterioration that is experienced. . . . This observation of Dr. Waterhouse has, according to the experience of many, much justice in it; as also that between sixty-one and sixty-two a similar deterioration of health takes place, but with aggravated symptoms." These periods or cycles of natural illness, together with those that are more generally known, puberty and the climacteric, no doubt constitute the opportunity of the unscrupulous and of the charlatan. The terror which arises from a natural time of unfitness is in many minds not to be dispelled by the sober reassurances of honourable medical men, and drives the sufferer to read the puffs which disgrace almost every journal in this country. The net is so carefully spread that it is capable of catching every kind of game, and the lure is furnished in the shape of testimonials, many of them written by medical men who appear incapable of resisting the temptation of seizing the only opportunity they can have of seeing their names in print.

Turning to the new articles, which give an index of the direction of medical progress in the last twelve years, they are found to be based chiefly on biological discoveries. Thus the original article which appeared under the head of "Micrococci," by Professor Greenfield, in the first edition, is replaced by a much longer article on "Micro-organisms" by the same author and Dr. Robert Muir. This section is of the highest interest even to unprofessional readers, and when it is considered that it is but the condensation of an immense amount of scientific work it is then realised that the last twelve years of medical endeavour are perhaps fuller of fruit than any equal period of time in the whole history of medicine. Reflection here affords a ready answer to the well-meaning but illogical persons who strive by the distortion of facts to influence popular opinion, with the object of the suppression of experimental pathology, and who, though they do not hesitate to use horses that have suffered excruciating pain and unsexing mutilation in order to make them useful, fly into hysterical excitement at the idea of experiments which inflict not so great a pang as the lash their coachmen are allowed to ply freely when their masters are in haste to catch a train.

In a world of pain and struggle people may be thankful that so much human and animal life and suffering has been saved by the practical application at the hands of great men, such as Lister and MacEwen, of the bacteriological knowledge of which Pasteur and Koch laid the foundations.

The last portion of this section succinctly relates the new discoveries initiated by Laveran with regard to the malarial fevers. It appears that these diseases which decimate our men and beasts in many of our Indian and other expeditions, and shut off from colonial enterprise many thousands of miles of the earth's surface, are caused by microscopic animal parasites. Other important biological chapters are those on phagocytosis and immunity, by Dr. Sidney Martin, and those on entozoa and psorospermia, by Mr. Bland Sutton. Phagocytosis is defined as "the property possessed by certain animal cells of taking into their substance solid particles, which may be either rejected, or used by the cell for its nutrition, or, when the solid mass is living, may destroy the cell."

Dr. Martin's brief account of the work of Metschnikoff gives an epitome of one of the most striking of the true romances of science.

Bacteriology has, as well as its biological, a chemical aspect, which is well treated by Dr. A. P. Luff under the head of ptomaines.

Thus it may be seen even by one not well versed in medical matters that the work is in the highest and best sense of the word authoritative, that it contains a sufficient account of what is firmly established of all the discoveries of the last twelve years bearing directly on medical practice, and perhaps those who follow all medical matters closely may notice that some questions still under controversy have not been alluded to. This reticence is perhaps wise in a work of reference of this kind. In conclusion, the opinion can but be repeated that the two volumes constitute a legitimate source of pride and satisfaction to those responsible for its production, and it may be added that the work cannot fail to influence in the right direction medical thought and education.

Notes and Queries.

DISTINCTION BETWEEN ANTIPYRINE AND TOLYPYRINE.

Tolypyrine is a homologue of antipyrine, obtained by a similar process, which differs in the substitution of paratoluidine for aniline as the starting point, the intermediate product being paratolylhydrazin instead of phenylhydrazin, as in the case of antipyrine. As a means of distinguishing the two, according to Stock, weak solutions of tolpyrines are affected and even precipitated by a 15 per cent. soda solution, though even concentrated solutions of antipyrine remain unaltered. The melting point of a mixture of the two compounds is also said to be lower than that of the one which melts at the least elevated temperature (*Pharm. Zeit.*, and *Répertoire*).

DETECTION OF MIXED OILS.

It is proposed by de la Royère to detect vegetable or animal oils in mineral oils by means of a solution of fuchsine decolorised by a caustic alkali. The solution employed should contain 50 Cgm. of fuchsine per litre of water, and caustic soda solution be added until decoloration is just effected. On adding to a few drops of the suspected oil in a capsule, two drops of

this reagent, the mixture is said to remain colourless if the mineral oil be pure, but acquires a rose tint if vegetable or animal oil be present. The method is said to operate successfully with coals, hemp-seed, linseed, olive, marigold, cotton, palm, castor, almond, sesame, neatfoot, and cod liver oils (*Rev. inter. de fals.*, through *Répertoire*).

TURPENTINE IN BALSAM OF PERU.

According to the *Bollettino chimico farmaceutico* pure balsam of Peru is coloured cherry red when treated with pure sulphuric acid. If turpentine be present, however, the mixture darkens and sulphurous acid is liberated (*Répertoire*).

ANTI-KAMNIA, PYRETINE, AND PHENATOL.

These are American preparations, and consist of mixtures of substances possessing antipyretic, analgesic, and antineuralgic properties. Anti-kamnia is said to be a mixture of sodium bicarbonate, acetanilide, and caffeine. Pyretine, as analysed by A. L. Weller, is composed of acetanilide, 58.7 per cent.; caffeine, 6.8; calcium carbonate, 13.4; and sodium bicarbonate, 19.5. Phenatol he describes as a mixture of acetanilide; sodium bicarbonate, carbonate, sulphate, and chloride; and caffeine (*Pharm. Zeit.*, and *Journ. de Pharm.*).

THYROID PILLS.

Thyroid glands are made into pills by Benzon, of Copenhagen, by the following method:—The glands are freed from grease and enveloping membranes, then finely divided, spread in thin layers on plates, and dried in a stove, at a temperature between 40° and 50°. When desiccation is complete the matter is powdered, then washed with ether to remove any remaining traces of fat. Finally, the powder is massed with simple syrup, and the pills when cut are rolled in cocoa to mask the odour of the glands (*Pharm. Zeit.*, and *Journ. de Pharm.*).

SOLUTION OF FERRI PYROPHOS.

"Nemo" asks "why a solution of ferri pyrophos in water (strength 1 in 5), to which is added 10 per cent. of S.V.R. (60 o.p.), should go as thick and viscid as treacle if kept for some length of time?"

Ferrum Pyrophosphoricum, of the British Homœopathic Pharmacopœia, is a scale preparation, containing about 55 per cent. of pyrophosphate of iron, $\text{Fe}_2\text{P}_2\text{O}_7$, combined with citrate of soda. Another form of the preparation contains ammonia in place of soda. Either form is readily soluble in water, but is precipitated by adding excess of spirit, and in the instance given the saturation point is probably exceeded. Possibly, too, the peculiar appearance noted may be due to other phosphates of iron, present as impurities. Perhaps some readers of the Journal may be able to offer further explanations.

PURE ETHYL NITRITE.

"Assistant" inquires "whether pure ethyl nitrite is such an unstable compound as stated, and only procurable in solution?"

Pure ethyl nitrite cannot be kept under ordinary conditions without decomposition taking place. The most stable preparation is probably a 2 per cent. solution in absolute alcohol, to which 5 per cent. of

glycerin has been added, as recommended by Mr. John Williams (see *Pharm. Journ.* [3], xviii, 862).

SYNTHESIS OF ALCOHOL.

"Years ago I read that Bertholet derived alcohol from $H_2O + C + Carb.$ of Baryta. Can you inform me if I am right, and, if so, by what process, and the chemical equation? ALFRED ROEBUCK."

In Bertholet's experiments ethylene was absorbed by concentrated sulphuric acid, and the product absorbed by barium carbonate, the corresponding sulphovinate being thus formed. Distilled with potassium benzoate, the barium sulphovinate yielded benzoic ether, and this, treated with aqueous potash solution, gave benzoic acid and alcohol (see *Annales de Chimie et de Physique* [3], xliii, 385).

Correspondence.

TESTS FOR GALLIC AND TANNIC ACIDS.

Sir,—The so-called tests for gallic and tannic acids given in Mr. Davis' letter in last week's Journal are strictly on a par with the information contained in his recently published handbook of 'Practical Histological Botany,' which was so fitly reviewed in the *Pharmaceutical Journal* of June 2. It is a fact well known to the most elementary student of chemistry, that distinguishing tests for two or more somewhat similar substances, to possess any value whatever, must be applied to the substances under identical conditions. In order to apply this very elementary principle, Mr. Davis proceeds to test for tannic acid with a neutral solution of barium chloride, and for gallic acid with what is practically alkaline barium chloride, hence his discovery of a new test is utterly worthless and inaccurate. If the test be applied to the two acids under identical conditions the result is the same in both cases, namely, a white precipitate, which rapidly turns dirty blue. Secondly, the behaviour of these two acids towards solutions of neutral and alkaline salts of barium and other metals is already well known by most workers who have had any practical experience in testing the various tannins. I have often used barium chloride solution as a test for a tannin, and would refer Mr. Davis to the useful tables in Allen's 'Commercial Organic Analysis' and Proctor's 'Handbook of Tanning.' Mr. Davis' wonderful discovery (?) is thus rather behind the times, besides being valueless. The further publication of this chemical absurdity by Mr. Davis more than justifies the concluding paragraph in your review of a 'Punch-like parody of histological botany,' recently launched upon the world by a Bachelor of Science (??). In order that future readers of the journal may not be misled by Mr. Davis' supposed discovery, I trust you will publish the above facts.

101, High Holborn, W.C.

A. H. MCCONNELL.

[For being enabled to publish the following letter relating to a subject of interest to the trade, we are indebted to the courtesy of the editor of the *Chemist and Druggist*, who has, at the request of the writer, placed a proof at our disposal.—Ed. *Pharm. Journ.*]

WINE OF IRON.

Sir,—It may interest your readers to know the following facts:—Occasionally I have been asked to supply "steel wine," and, presuming the wine of iron of the British Pharmacopoeia was the preparation referred to, this article has been supplied, and labelled "Steel wine; prepared according to the British Pharmacopoeia." Lately I had a suspicion that the sale of this preparation without a wine-licence might be contrary to the rules of the Inland Revenue Department, and, to make myself sure on this point, I sent a small bottle to the Department, labelled as usually sold to the public. In due course I received a reply from the Department, giving the percentage strength of proof spirit and the equivalent of "metallic iron" in the fluid ounce; and, as the latter was not equal to 1 gr. metallic iron, the De-

partment stated that it could not be sold without a licence. I wrote the Department that the quantity of iron in the wine would depend upon the acidity of the sherry, and, although it was possible to medicate it to the extent required, such a wine would not be strictly B.P. In a further communication the Department says that the medication of the wine is to prevent its use as a beverage, and the British Pharmacopoeia is not accepted as a guide. The position of the retail chemist, therefore, is that if he supplies wine of iron, B.P., except according to the prescription of a medical man, containing instructions for labelling as a medicine, without having a licence, he renders himself liable to a fine.

Leeds.

EDWIN YEWDALE.

THE REVISION OF THE BRITISH PHARMACOPEIA.

Sir,—Why should Mr. Hyslop say "mel. anglicanum?" Surely Irish bees have not ceased to gather honey all the day, and Scotland is not without fame for heather honey. Perhaps Mr. Hyslop would exclude the latter, or if he admitted it there would need to be two descriptions for "mel." SCOTUS.

Answers to Correspondents.

"*Lee*."—Apply to the Secretary, Prisons Department, Home Office, London, S.W.

H. Wilson.—We are unable to recall the abstract you refer to, but will advise you if further search proves successful. Meanwhile, refer to Palmer's 'Index to the Times.'

Books, etc., received.

THE PHARMACOPEIA OF THE LONDON HOSPITAL. Compiled under the direction of a Committee appointed by the London Hospital Medical Council. Pp. 262. London: S. F. Hodson. From the Hospital.

MILK TESTING, AND PAYMENT FOR MILK BY RESULTS. By C. C. LANCE. Second Edition, Revised and Enlarged. Pp. 42, with Table of Gallon Values. 2s. 6d. Melbourne: Tytherleigh and Bayne. From the Author.

BEGINNERS' GUIDE TO PHOTOGRAPHY. By a Fellow of the Chemical Society. Fifth Edition. Pp. 119. 6d. London: Perken, Son, and Rayment. From the Publishers.

THE NATURAL HISTORY OF PLANTS. By KERNER and OLIVER. Part 2. 2s. 6d. net. London: Blackie and Son. From the Publishers.

PRACTICAL POINTS ON THE HYGIENE OF SHIPS AND QUARANTINE. By W. COLLINGRIDGE, M.A., M.D. Read before the Shipmasters' Society, London, on April 20, 1894. Pp. 43. 6d. London: Shipmasters' Society, 60, Fenchurch Street. From the Author.

Diary of the Week.

SUNDAY, JULY 8.

Chemists' Assistants' Association.

Second Monthly Excursion, to Virginia Water.

WEDNESDAY, JULY 11.

Pharmaceutical Society of Great Britain.

Library, School, Museum, and House Committee.

Three Towns and District Chemists' Association, at 3 p.m.

Quarterly Meeting at the Foresters' Hall, Plymouth.

SATURDAY, JULY 14.

Quekett Microscopical Club.

Excursion to Woking. Meet at Waterloo, Main Line Station.

Erratum.—In the formula for dimethyl-morphine given in last week's Journal (p. 1086), the nitrogen atom was credited with a bond too many—that to the left. In the process of printing, also, the figure 2 after the methyl formula, which should read $(CH_3)_2$, appears to have dropped out.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Cracknell, Grimble, Hill, Hunt, Laing.

Practical Pharmacognosy.

(Continued from Vol. xxiv., p. 959).

SYSTEMS OF TISSUE.

BARKS.

In order to take an intelligent and comprehensive view of the structure of medicinal barks, it is desirable that the manner in which the primary and secondary tegumentary tissues develop should be clearly understood by the student, and the following summary of the latest information on the subject, as presented by Strasburger, Vines, and other eminent botanists, may therefore be found of value as an introduction to practical work.

Differentiation of Growing Points.

The growing points of stems and roots consist of small-celled "meristem" or generating tissue, in

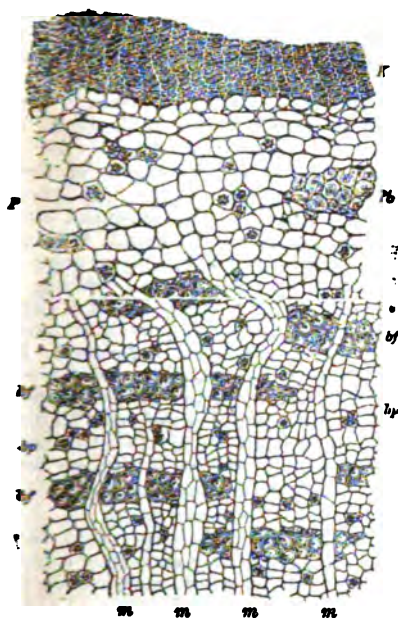


Fig. 20.—Bark of *Rhamnus frangula*. Transverse section—K, cork; P, parenchyma; Pb, primary bast; bf, bast fibres; bp, bast parenchyma; m, medullary rays. x abt. 120. (Moeller.)

which the cells still continue to divide and subdivide to form permanent tissue. The cells are all embryonic, yet they are so far differentiated that three well-defined rudimentary tissue systems can be distinguished. Thus, the growing point is found to consist (1) of a superficial layer which is continuous with the epidermis and is, in fact, the embryonic epidermis or "dermatogen"; (2) one or more layers within the dermatogen, constituting the "periblem," continuous with the fundamental tissue outside the bundles (extra-stelar); and (3) the "plerome," a solid mass of somewhat elongated cells in the middle, which gives rise to the axial cylinder of tissue (the "stele") in the plant.

Nature of the Epidermis.

The "epidermis," or primary tegumentary tissue, may be described generally as the external layer of cells covering the body of the young plant, and, in

the most exact meaning of the term, can only exist where there is a definite "dermatogen," i.e., in the Phanerogams and the roots of the Pteridophyta. Usually, however, the application of the term is confined for convenience to the primary tegumentary tissue of the shoot, that of the root, apart from the root-cap, being referred to as "epiblema."

The epidermis consists, in the great majority of cases, of a single layer of cells, but in some foliage leaves two or more layers are found. The continuity of this enveloping membrane is interrupted in certain cases by well-defined apertures, termed stomata, which permit communication between the intercellular spaces of the internal tissues and the external air. The epidermal cells themselves are characterised by the thickening and cuticularisation of their walls, the external wall being

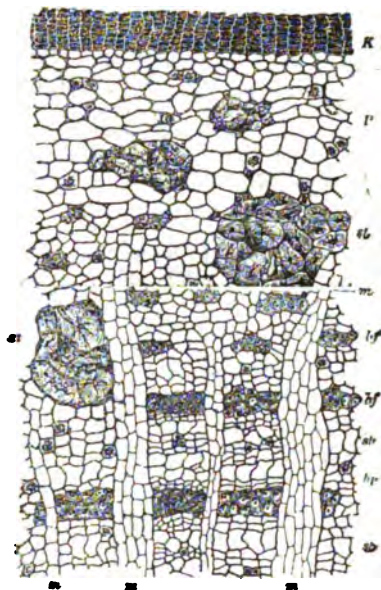


Fig. 21.—Bark of *Rhamnus purshianus*. Transverse section—K, cork; P, parenchyma; st, sclerenchyma; bf, bast fibres; sb, sieve tubes; bp, bast parenchyma; m, medullary rays. x abt. 120. (Moeller.)

usually much more thickened than the others. The outermost layer of the epidermis—known as the "cuticle"—is also clearly defined from the inner layers, which are cuticularised to a less extent.

Cortex or Hypoderma.

Immediately within the epidermis occurs the cortex, or "hypoderma," which appears to be developed from the "periblem" as the epidermis is developed from the "dermatogen," and may consist primarily of one or more layers of collenchymatous or sclerenchymatous supporting tissue. In roots, the hypoderma is distinguished as the "exodermis."

The effect on the epidermis and cortex of the development of secondary tissue in the interior of a young stem or root is one of pressure and tension; the radial growth of the tissue of the central cylinder (stele) exerting a radial pressure upon the external tissues, while the tangential growth of the stele tissue exerts a tangential tension on them. The radial pressure tends to cause more or less rapid

obliteration of the softer cortical tissue; whilst the tangential tension stretches the cortical cells and tends to cause them to grow tangentially, and multiply by radial division. According as the radial pressure or the tangential tension predominates, the primary cortex is either rapidly destroyed, or persists for a very considerable period.

Secondary Outer Tissues.

The secondary outer tissue of the stem is formed by the "phellogen," or cork-cambium, a layer of special merismatic cells formed from the epidermis, or, more commonly, from the outermost or other

tissue a new secondary phellogen is developed internally to the first. This also is of limited duration, and the process is repeated at intervals, until at last the phellogen layers penetrate into the bast-tissue of the bundles.

Since the walls of the cells constituting the periderm generally become completely suberised, this tissue is often termed "cork." It contains no intercellular spaces, and consists of more or less cubical parenchymatous cells, which are sometimes elongated tangentially; they gradually lose their protoplasmic contents and become filled with air. In the periderm of both stems and roots there are frequently found "lenticels," which correspond to the stomata of the epidermis, and, like them, serve to admit air to the internal tissues. In branches of one year's growth the lenticels are seen as brownish or whitish specks.

On account of the properties of its cell walls the cork offers an obstacle to the passage of water. Consequently, all the tissues external to it dry up, and are eventually exfoliated, and the more deeply the phellogen is situated, the greater is the amount of primary tissue thus thrown off. "In a few trees, as the silver fir, the primary periderm persists for some years, or, as in the beech, during the whole life of the tree; the outer cork-cells split off as the trunk of the tree increases in thickness, while the phellogen, growing and extending in a tangential direction, gives rise to new layers of cork. When, as in most cases, new layers of phellogen arise after a few years in the deeper tissues, leading to the development of corresponding layers of periderm, an external investment of a more or less complicated structure comes to be formed. In consequence of the impermeability to water of these secondary layers of periderm, all the tissues lying externally to them become dried up. These dried-up tissues, which may belong to different tissue-systems and include the most various forms of cells, constitute what is known as 'bark' "(Vines).

Constitution of Bark.

It will be apparent, therefore, that barks, on account of their frequently extremely complicated structure, may require very careful study if their elements are to be properly differentiated and recognised by the student. Those used in medicine are almost exclusively obtained from the stems of dicotyledons or gymnosperms, but few being obtained from the roots; whilst monocotyledons have no true bark, because they do not increase in thickness by secondary growth such as occurs in dicotyledons.

Technically, the bark is regarded as including the whole outer layer of stems and roots, separated from the wood by the cambium layer. Very young barks only are covered by the epidermis. Where the latter is replaced by cork, the outer layer or periderm is distinguished as the "exophloeum," or outer bark; the middle bark, consisting mainly of the primary cortex, composed of parenchyma containing chlorophyll, is the "mesophloeum"; and the inner bark or liber (bast) is the "endophloeum." This inner or secondary bark is composed of axially elongated bast parenchyma, bast fibres, and sieve tubes, i.e., the phloem portion of the fibro-vascular bundles, and is intersected by medullary rays, formed of radially elongated parenchyma.

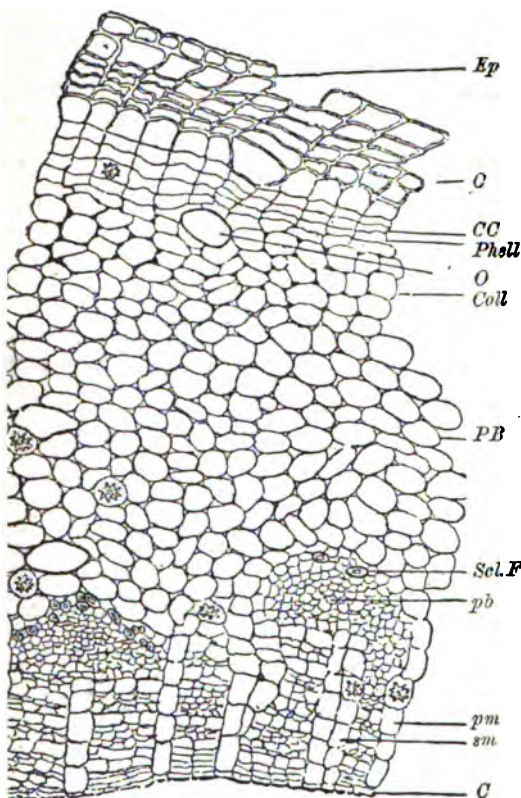


Fig. 22.—Transverse Section of Young Canella Bark. *Ep*, epidermis; *C*, cork; *CC*, cork cambium; *Phell*, phellogen; *O*, oil cell; *Coll*, collenchyma; *PB*, primary bark; *Scl. F*, sclerenchymatous fibres; *pb*, primary bast; *pm*, primary medullary ray; *sm*, secondary medullary ray; *C*, cambium. $\times 100$. (Greenish).

layer of the cortical parenchyma. Sometimes, even, it may be formed from the "endodermis," or bundle-sheath, or, again, from a layer of cells belonging to the "pericycle" or peripheral tissue of the central cylinder of the stem. By repeated centripetal division the "periderm," constituting the secondary tegumentary tissue of the stem or root, is formed on the outer side of the phellogen, and by repeated centrifugal division the "phelloderm" is formed on the inside. The primary phellogen has frequently but a limited period of merismatic activity, though in the stems of the beech, cork-oak, silver fir, etc., it is persistent. When it has been converted into some form of permanent

The outer bark has been assumed to contain no active constituents, and is usually rejected, though, if thin, it is often allowed to remain attached, and affords a useful means of distinction. In the parenchyma of the middle bark may be found cells containing volatile oil, resin, mucilage, or crystals (oxalate), and stone cells (sclerenchyma) and collenchyma are not uncommon. Secondary cork may be formed in the interior of the bark tissue, and then tends to become thrown off in scales which include the portions of tissue external to the bands of cork. This peculiar form of suberous tissue has been distinguished by the term "rhytidoma" (German "borke"), and where it has formed and been removed with the external tissues, the inner bark alone remains, as in the case of elm and coto barks. Long, soft, intertwining bast fibres

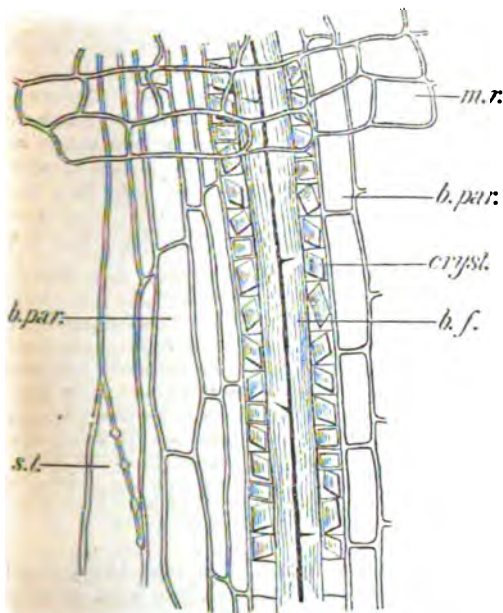


Fig. 23.—Bark of *Rhamnus frangula*. Radial section. *Mr.*, medullary ray; *b.par.*, bast parenchyma; *cryst.*, crystals; *b.f.*, bast fibre; *st.*, sieve tube, showing plate. $\times$ aft. 320. (Greenish).

are characteristic of mezereon bark; short, usually isolated and strongly thickened bast tubes render cinchona barks brittle; and bundles of long, wave-like bast fibres, intersecting in places, mark the outer surface of cinnamon bark. Larch bark affords a good example of rhytidoma; and oak bark or willow of cork. In cascarilla bark colouring matter and crystals of calcium oxalate are found in numerous cells of the middle bark; coto bark contains staff-shaped bast cells, partially sclerotised medullary rays, and bundles of collapsed sieve tubes; and in quebracho bark the bast cells are sometimes found indented by crystal cells.

Reactions of the Phloem Elements.

The bast fibres are distinguished from the sieve tubes and other constituents of the phloem, according to Poulsen, by staining a deep red with Hanstein's aniline-violet (equal parts of methyl violet and fuchsine, dissolved in alcohol). They

also assume an intense red colour after prolonged treatment with aqueous extract of cochineal with acetic acid or alum. Other elements absorbing this stain are decolorised by after-treatment with hydrochloric or sulphuric acid; but the colouring of the bast fibres is thus said to be rendered more intense. If lignified the bast fibres assume an intense rose-red colour when the section containing them is treated with hydrochloric acid and then placed in a drop of phloroglucin solution on a glass slide. The plasma of sieve tubes may be coloured by eosine, and the callus by aniline blue or rosolic acid. The suberin of cork cells is insoluble in concentrated sulphuric acid or in cuprammonia, may be extracted from corky tissue by boiling in potash solution, and treatment of thin sections with nitric acid and potassium chlorate results in the partial solution of the cell walls, and separation of yellow masses of ceric acid. Ohromic acid dissolves both cellulose and lignified cell walls entirely, and renders those containing suberin transparent, dissolving them only after prolonged action. As in the case of lignin, chlor-iodide of zinc colours cork cells yellow, and Grenacher's alum carmine does not affect them, whereas pure cellulose is coloured violet by the first and red by the second.

Rhamnus Barks.

The barks of *Rhamnus frangula* and *R. purshianus* will be found the most suitable for students to study in the first instance, as the structural elements are more clearly differentiated in these than in many others. A transverse section of *R. frangula* is represented in Fig. 20, where a considerable formation of corky periderm (*K*) is indicated as constituting the outer bark. The middle bark consists of parenchymatous cells, some of which contain crystals, and at one point (*pb*) primary bast cells are seen. In the inner bark the medullary rays (*m*) are distinctly visible, splitting up the phloem, consisting of bast fibres (*bf*), sieve tubes and bast parenchyma containing crystal cells. A radial longitudinal section is represented in Fig. 23. The bark of *R. purshianus* (Fig. 21) is very similar in its general arrangement, but the development of the sclerenchyma or stone cells (*st*) is very marked.

Canella Bark.

In the case of canella, the relation of the different tissues in the bark is very clearly shown in young bark (Fig. 22). The periderm of old barks often contains groups of sclerenchymatous cells derived from the phellogen. The latter does not invariably include sclerenchyma however, as that tissue may be partially or entirely replaced by thin-walled, non-lignified cells containing small starch grains or rosette crystals of calcium oxalate; and oil cells may also be present. The middle bark usually contains calcium oxalate and numerous oil cells, but the inner bark is present in the largest proportion in mature specimens, and consists of alternate rows of bast parenchyma and sieve tubes. The last-named frequently yield lignin reactions, are bluntly pointed, and have numerous, closely crowded sieve plates on their radial walls. The structural details of canella bark will be found fully described in Professor Greenish's paper at page 793 of the last volume of the Journal.]

(To be continued.)

SOME COMMON SOURCES OF ERROR IN TESTING FOR SUGAR IN THE URINE.*

BY SIR GEORGE JOHNSON, M.D. LOND., F.R.S.

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It has happened to me during the last quarter of a century or so to be consulted by a considerable number of patients who were being treated for glycosuria, but in whose urine I could find no trace of sugar. As these patients had been strictly dieted, and were taking highly nitrogenous food, to the exclusion, as far as possible, of saccharine and farinaceous materials, it might plausibly be supposed that the absence of sugar when the patients came under my notice was the result of the treatment. In order to test this they were directed to return to an ordinary mixed diet including sugar, sweet fruits, and starchy food of all kinds. After a week or more of this diet the continued absence of sugar led to the conclusion that a mistake in the mode of testing for sugar had led to an erroneous diagnosis. In nearly, if not quite, all the cases to which I am referring they had the same general characters. The specific gravity was high, 1.030 or more; there was an excess of urea, as shown by the large mass of crystals which resulted from the addition of an equal volume of strong nitric acid to the urine, the mixture being stirred with a glass rod and afterwards cooled, while an analysis indicated as much as 3 per cent. of urea. In none of the cases had there been excess of urine, thirst, or other symptoms of diabetes. The cases, in fact, come under the designation of azoturia. The power of digesting and assimilating nitrogenous food is impaired, there is an excessive excretion of urea, and, as I shall presently show, of other nitrogenous products by the kidneys. Obviously they are not cases in which a highly nitrogenous diet is likely to be beneficial, but rather the reverse; so that, as often happens, a wrong diagnosis suggested an erroneous method of treatment. Now in all these cases, with one exception, the copper test had been used, either Trommer's process or Fehling's solution. In the one case a highly albuminous urine had been boiled with liquor potassæ (Moore's test), and the dark colour resulting from the combination of the sulphur of the albumin with lead in an impure specimen of liquor potassæ was mistaken for the brown colour produced by boiling potash with glucose. The explanation of the mistakes which have been made in using the copper test for sugar is to be found in the fact that all normal urines contain two substances which resemble glucose in their power of reducing the oxide of copper: these substances are uric acid and kreatinine.

Dr. Pavy† has shown that uric acid accounts for one-fourth of the reducing action of normal urine upon copper solution, and he suggests that the remainder of the reduction is due "to the small amount of sugar naturally present in the urine." "It is doubtful," he says, "if there is any

other body worthy of consideration to exert any possible reducing effect." My son, George Stillingfleet Johnson, Demonstrator of Chemistry in King's College, confirms Dr. Pavy's observation with regard to uric acid, but he has further made the interesting and important discovery that the remaining three-fourths of the reduction is due to kreatinine. In short, he has shown that uric acid and kreatinine together account for the whole of the reduction which is effected by urine upon copper solutions, and that no trace of glucose is to be found in normal urine.* The details of my son's investigations are to be found in a very elaborate paper in the forty-third volume of the 'Proceedings of the Royal Society,' p. 493, while the results are more briefly recorded in his paper on "The Absence of Sugar from Normal Urine" in the seventy-sixth volume of the 'Royal Medical and Chirurgical Transactions.'† The success of his investigation is mainly due to the fact that he has done what had never before been accomplished—by mixing mercuric chloride with urine he not only separates the uric acid, but he obtains the whole of the kreatinine in combination with mercury as a definite chemical compound. The mercurial salt being analysed, he finds it to contain one-fifth of its weight of kreatinine, and the kreatinine thus separated in a beautiful crystalline form has had its ultimate composition accurately determined. The uric acid and the kreatinine having been removed by the mercuric chloride and the excess of mercury got rid of by ammonia and subsequent filtration, the filtrate is found to have no reducing power upon a copper solution or upon picric acid. That the separation of the kreatinine by the mercuric chloride process does not remove any glucose that might be present is proved by the fact that when a known quantity of glucose is added to normal urine it is found undiminished after the removal of the kreatinine.

It will, perhaps, be remarked that there is no novelty in the separation of kreatinine from urine by means of mercuric chloride; but a careful perusal of my son's papers will reveal much that is new. Thus, the following processes are entirely original: 1. The kreatinine is separated by fractional precipitation with mercuric chloride. The uric acid, etc., are precipitated first and removed at once by filtration, whilst a pure compound of the mercuric chloride with the kreatinine separates from the filtrate on standing. 2. Throughout all the processes adopted in preparing the pure urinary kreatinine no heat is employed. 3. As a result of these novel methods of procedure the kreatinine obtained is really a new base—i.e., its properties are entirely different from those of any kreatinine hitherto described, and not the least striking difference consists in its much more active

* Though neither sugar nor albumin is present in normal urine, a small amount of one, or even both, these substances is sometimes found in urine, unassociated, for a time, with other evidence of disordered health.

† The method employed and its results are described in Watts's 'Dictionary of Chemistry,' edited by Morley and Muir, 1889, vol. ii., pp. 270 and 271; also in Bloxam's 'Chemistry,' edited by J. M. Thomson and A. J. Bloxam, seventh edition, 1890, p. 687.

* Reprinted from the *Lancet*.

† *Med. Chir. Trans.*, vol. lxxiii.

reducing properties.* It was his discovery that the kreatinine in normal urine is sufficient to account for the total reduction of picric acid when that agent is used as a test, and for three-fourths of the reduction of cupric oxide, the remaining fourth being due to uric acid, that led to the conclusion that no sugar is present in normal urine. Additional evidence of the absence of sugar from normal urine is afforded by the fact that the very sensitive phenyl-hydrazine test gives no indication of sugar in that secretion. It has been suggested that my son's researches would have attracted more attention if he had given a new name to the substance which he has isolated and analysed, but as it is isomeric with other kreatinines it is, perhaps, sufficient to distinguish it by the name of the "natural kreatinine of urine."

One advantage amongst others which the picric acid has over the copper test is that it is not affected by uric acid. The result is that the degree of reduction in normal urine is an exact indication of the amount of kreatinine present, and here we have a simple means of testing the accuracy of the results of my son's researches. This is done by comparing the colour resulting from the application of the test to the urine with that which results from testing an aqueous solution of kreatinine of the same strength as that indicated to be present in the urine; but it must be borne in mind that the reducing power of kreatinine is inferior to that of glucose in the proportion of 10 to 12, so that if the urine tested with picric acid gives a colour which, if glucose were the reducing agent, would indicate one grain per ounce, the kreatinine solution, to give the same colour, would have to contain 1.2 grain per fluid ounce. If the reduction by the urine were 0.8, then as 10 : 12 :: 0.8 : 0.96. The amount of kreatinine would be 0.96 grain per ounce, and experiment confirms the result of the calculation. One point, however, has to be noticed. When the colours resulting from testing urine and an aqueous solution of kreatinine of the same strength are compared, the former is usually seen to be very slightly darker. The difference, which is so small as to be incalculable in amount, is due to the colouring matter in the urine, which may be removed by filtering through animal charcoal before applying the test. A very simple experiment shows how minute a quantity of urinary kreatinine suffices to give the characteristic red colour with the picric acid test. A drachm of a saturated solution of picric acid is mixed with an equal quantity of water and half a drachm of liquor potassæ (P.B.). The precipitated picrate of potash is dissolved by raising the mixture to the boiling point. The result is a liquid of a slightly darker yellow colour than the cold and undiluted picric acid solution, but without the slightest tinge of red.† If now

a single drop of a solution of kreatinine, in the proportion of one grain to the fluid ounce, be allowed to trickle down the side of the sloped tube into the liquid, a bright red colour is rapidly diffused from the top to the bottom of the column of liquid. It may be that the readers of this paper would find it difficult to obtain the genuine urinary kreatinine, which at present is not to be bought from any manufacturing chemist, but they will find that precisely the same result follows the addition of a drop of normal urine to the hot solution of picrate of potash. The proportion of kreatinine in an average specimen of normal urine and in a grain to the ounce solution of kreatinine is approximately the same, and the amount of the agent in one minim of the aqueous solution, as in one minim of normal urine, would obviously be no more than $\frac{1}{10}$ th of a grain.

In using the picric acid test for glucose with a knowledge, which every practitioner should possess, of the reducing action of kreatinine upon that agent, it is scarcely possible to fall into the error referred to at the commencement of this paper—namely, that of supposing that sugar exists in urine which is quite free from that substance. When to a drachm of normal urine in a test-tube about half an inch in diameter is added an equal volume of a saturated solution of picric acid and half a drachm of liquor potassæ, the mixture immediately becomes red, owing to the partial reduction of the picric acid by kreatinine. Kreatinine differs from glucose in the fact that in the presence of potash it exerts some reducing action on picric acid at the ordinary temperature of the air. When kept at the boiling point for a minute the colour is deepened, and in normal urine it may be such as to indicate what, if glucose were the reducing agent, would equal from 0.6 to 1.2 grain per fluid ounce, as shown by the micro-saccharometer. I have repeatedly shown that a solution of glucose, in the proportion of 2 grains to the fluid ounce of water, when tested as above described, gives so dark a colour that no red light is visible through the middle of the column of liquid. If, therefore, a sample of urine having been thus tested, a bright red colour is transmitted through the full diameter of the test-tube when held up to the light, the reduction is due to kreatinine alone, and no glucose is present. If, however, the colour is so dark as to indicate an amount of reduction equivalent to two or more grains of glucose, this is more than the largest proportion of kreatinine hitherto found in any specimen of urine would account for, and the presence of sugar is indicated. The amount of sugar can be determined after separating the kreatinine by the mercuric chloride process before described.* In

liquid also being turbid. A simple test of the purity of picric acid as a test agent is to boil the solution with half its volume of liquor potassæ. The result should be a clear yellow liquid, neither turbid nor red.

* In two tables, at pages 502-3 of my son's Royal Society paper, the highest amount of reduction of picric acid in a large number of samples of normal urine is shown to be 1.2, and the lowest 0.6. In urine of high specific gravity the amount of kreatinine and the consequent reduction of picric acid are found to be increased, together with that of the other normal solids of the urine.

* The various modes of obtaining kreatinine from urine, and the contrasted properties of the different products thus obtained, are set forth in a table in 'Proc. Roy. Soc.' vol. 1, p. 291, and in 'Med. Chir. Trans.' vol. lxxvi, p. 155.

† I once met with an impure specimen of picric acid which gave a red colour when boiled with potash, the

illustration of this the result of an analysis of a urine of high specific gravity may be briefly stated. The specific gravity was 1.035, colour normal; 20 minims added to 2 drachms of boiling Fehling's solution gave a copious precipitate of sub-oxide of copper. The picric acid process indicated a reduction of 1.8 grain per ounce. After the separation of the kreatinine by mercuric chloride the reduction was reduced to one grain per ounce, and this indicated the amount of glucose present. The high specific gravity was mainly due to excess of urea (3.1 per cent.), which formed a solid mass of crystals with nitric acid. The high specific gravity and the reduction of Fehling's solution, without a quantitative analysis, would naturally suggest that the urine must be highly saccharine, but, on the other hand, there had been no excess of urine, thirst, or other symptoms of diabetes. The process by which the natural kreatinine is separated from the urine unchanged by heat or other violent methods occupies forty-eight hours; but the mere separation of the kreatinine may be effected in a short time by the following method. Add to the urine one-twentieth of its volume of a saturated solution of sodium acetate and nineteen-twentieths of its volume of a saturated solution of mercuric chloride and filter.* Boil the filtrate for five minutes and filter. Remove the excess of mercury by a few drops of strong liquor ammoniac and again filter. The filtrate will be free from kreatinine, and the amount of glucose, if any, can be determined, bearing in mind that the urine has been diluted by its own volume of liquid. If the loss by boiling has not been made up by the few drops of ammonia, this must be supplied by adding water before the analysis is made. It scarcely need be said that in analysing diabetic urine, when the amount of sugar is large, there is no need to take account of the small amount of reduction due to kreatinine.†

Some years since‡ I published the fact that the urine of patients who are taking salicylate of soda is reddened by the picric acid test to a degree that might indicate from one to two grains of glucose per ounce. Cupric oxide is also reduced by the same urine as if by a small amount of sugar. I ascertained that the sodium salicylate has no reducing action upon either test. My son tested twenty-seven specimens of salicylate urine, and found that the reduction with picric acid ranged from 1.0 grain to 3.0 grains per ounce, the average being equivalent to 1.73 grain of glucose. He finds that the reducing agent is neither glucose nor an excess of kreatinine. It is, no doubt, some product of the decomposition of sodium salicylate; but salicyluric acid, which is found in the urine of these patients, does not reduce picric acid. These urines give a deep violet colour with perchloride of iron, which would indicate the presence of some unusual sub-

stance in the urine even if it were not known that the salicylate was being taken.

I have lately examined the urine of a rheumatic patient who was taking fifty grains of sodium salicylate in twenty-four hours. The sp. gr. was 1.032. Absence of sugar was proved by the negative result of the phenyl-hydrazine test. The picric acid test gave a colour equivalent to two grains of glucose per ounce. After separating the kreatinine by the quick process before described, the reduction colour in the filtrate was reduced to 1.2 grain. The absence of kreatinine in the filtrate was proved by the fact that no red colour occurred in the picrate of potash until the temperature reached the boiling point, and the presence of some product of salicylic acid in the filtrate, after the separation of the kreatinine, was proved by the violet colour with perchloride of iron. The indication of two grains to the ounce was due—0.8 grain to urinary kreatinine, and 1.2 grain to some product of the decomposition of salicylic acid. Chloral hydrate and chloroform, which are sometimes present in the urine, reduce cupric oxide, but have no action on the picric acid test.

My main object in the present communication has been to indicate some common sources of error in testing for sugar in the urine, and to recapitulate the main facts by which it has been conclusively proved that no sugar exists in the normal secretion. I may add that by means of the picro-saccharometer any practitioner may with ease, in the course of a few minutes, make an accurate determination of the amount of sugar per ounce or per cent. in a case of glycosuria.*

Oxford and its University.

(Continued from p. 4).

PROGRESS OF KNOWLEDGE AT THE UNIVERSITY.

To trace the progress of knowledge at the universities is, in great measure, to follow the development of literature, science, and art in Europe. At Oxford, the dominant study was at first logical and philosophical, an attempt being made "to extract knowledge from consciousness by syllogistic reasoning, instead of gathering it from observation, experience, and research, mocking by its barrenness of fruit the faith of the enthusiastic student, yet training the mind to preternatural acuteness, and perhaps forming a necessary stage in the mental education of the race. The great instrument of high education was disputation, often repeated, and conducted with the most elaborate forms in the tournaments of the Schools, which might beget readiness of wit and promptness of elocution, but could hardly beget habits of calm investigation or paramount love of truth." Some of the greatest schoolmen—Duns Scotus, Bradwardine, and Ockham—were produced by Oxford, and Aristotelian speculation occupied a prominent position there.

Theology and law were the leading faculties, how-

* The quantities may be: urine, $\frac{3}{4}$ —240m; solution of sodium acetate, 12m.; solution of mercuric chloride 228m.

† The various modes of testing for sugar in the urine will be found fully described in the author's "Medical Lectures and Essays," p. 792, etc.

‡ "Medical Lectures and Essays," p. 807.

* On referring to the advertising columns of *The Lancet* it will be seen that the saccharometer, with directions for its use, may be obtained from C. E. Müller, 148, High Holborn.

ever, philosophy being less lucrative, and physical science almost unknown, though the first rudiments of the latter and of mathematics had been brought to England by travellers, from the schools of Cordova and Bagdad. During the thirteenth century, Roger Bacon, whose reputed study existed, until recently, near Folly Bridge, studied the works of Aristotle, and devoted himself to the propagation of a knowledge of languages, geometry, arithmetic, and other subjects. After passing some time at the University of Paris, he returned to Oxford as a teacher, and attempted to extend scientific teaching there. But "scholasticism absorbed the whole mental energy of the student world. The temper of the age was against scientific or philosophical studies. The older enthusiasm for knowledge was dying down; the study of law was the one source of promotion, whether in Church or State; philosophy was discredited, literature in its purer forms became almost extinct." Bacon persevered, nevertheless, and produced his "Opus Majus," in which from grammar he passes to mathematics, under which term he includes all that was known to him of physical science, and thence to experimental philosophy. The famous astrologer and alchemist held that "he who knows not mathematics cannot know any other sciences, and what is more, he cannot discover his own ignorance or find its proper remedies." Bacon's special study was optics, but he also brought geography, chronology, arithmetic, music, hydrography, geography, and astrology to some extent into systematic form.

The period of the Reformation saw the destruction of priceless libraries at Oxford, and the religious wars checked all progress for the time being. "Whatever life remained to the University was chiefly absorbed in theological study and controversy," and "Oxford was turned into the cock-pit of the theological party." Later, the Civil War caused a gap in academical history, and though, under Cromwell, excellent learning again abounded, the Restoration saw the colleges filled with a crowd of dunces. "Drinking, idling, and tavern-haunting were in the ascendant. Study as well as morality . . . was out of fashion" and, as a result, about this period science was driven from Oxford, a step which resulted in the foundation of the Royal Society of London.

The eighteenth century in its early part saw some intellectual life at Christ Church, but otherwise it was a blank in the history of the University. The colleges had become rich and their incomes were divided amongst a host of sinecurists, who were in many cases unconnected with the University; devotion to a life of study was rendered impossible, and idleness, intemperance, and riot were rife among the students. Candidates for examination, on bribing the University officer, were allowed to select their own examiners, whom they treated after the ordeal, and Lord Eldon is said to have taken his degree upon an examination in which he was asked two questions only:—"What is the meaning of Golgotha?" and "Who founded University College?" Of science at this time there was none.

The latest revival came about the beginning of the present century. Classics and mathematics became once

more living subjects, and though the "Tractarian" movement for a time acted as a check, this was the end of the reign of ecclesiasticism at the University. A Royal Commission being appointed to inquire into the state of affairs, the result was that religious tests were relaxed, the curriculum and examination system were liberalised, and "science, long an exile, was welcomed back to her home at the moment when a great extension of her empire was at hand."

Another Commission, "acting on a still more recent Act of Parliament, has carried the adaptation of Oxford to the modern requirements of science and learning further than the old Commission, which acted in the penumbra of mediæval and ecclesiastical tradition, dared. The intellectual Oxford of the present day is almost a fresh creation. Its spirit is new; it is liberal, free and progressive Again, as in the thirteenth century, the day of Grosseteste and Simon de Montfort, Oxford is a centre of progress, instead of being, as under the later Stuarts, the stronghold of reaction."

THE UNIVERSITY BUILDINGS.

The buildings of the University are mainly grouped around the Radcliffe Library in the centre of the city. This was founded in 1737, by Dr. Radcliffe, physician to Queen Anne, and is now used as a supplementary reading room of the Bodleian, and known as the Camera Bodleiana. Close by is St. Mary's Church, the most beautiful of all the University buildings, where the University sermons are preached. The Convocation House is the hall of the University Legislature, and the place where the ordinary degrees are conferred. "Before each degree is conferred, the Proctors march up and down the House to give any objector to the degree—an unsatisfied creditor, for example—the opportunity of entering a *caveat* by 'plucking' the Proctor's sleeve." In the Divinity School adjoining, which dates from the Middle Ages, the examinations for degrees in theology are conducted. The Sheldonian Theatre is the scene of the annual commemoration of founders and benefactors. Here the inauguration of the Chancellor takes place, and honorary degrees are conferred. As in former days, the *terra filius* or licensed buffoon used to enliven the ceremony, so now the occupants of the undergraduates' gallery express their comments freely, and at times uproariously.

The University Council Chamber and the Registry are in the Clarendon, once the home of the University press, which has now migrated to larger premises in the north-west of the city. The Bodleian or University Library is one of the most important libraries in existence. It is entitled by law to a copy of every book printed in the United Kingdom, and is bound to preserve all it receives. Over the library is the Picture Gallery, containing the portraits, more or less fictitious, of early founders, and beneath used to be the schools or examination rooms, now replaced by the new buildings in the High Street. The Ashmolean Museum, close to the Bodleian, is now used for antiquities only. The other former contents of the museum and the medical library have been removed to the new University Museum on the north side of

the city, which by its existence may be said to proclaim the restoration of science at Oxford.

Less than sixty years ago there was not a single laboratory of any kind in connection with the University. A number of comparatively small endowments existed for professorships of chemistry, of anatomy and medicine, and smaller endowments for geology, mineralogy, astronomy, mathematics, and geometry. The Botanical Gardens, founded by Earl Danby in the seventeenth century, opposite Magdalen College, had been practically made by Dr. Daubeney, who devoted much time, money, and labour to developing them; and the nucleus of a fine herbarium also existed. Buckland and Lyell had also done much to overcome the neglect of natural knowledge by the University, but waves of indifference had swept over the place about the end of the last century, as already related. The revival came about 1830, but "left comparatively on one side the primary questions which belong to the unfolding knowledge of the nature and origin of organic beings and the unity of the material universe." In various ways enthusiastic workers in science were struggling to overcome the apathy with which their respective subjects were regarded, and encouragement was given to these pioneers by the British Association meeting at Oxford in 1847, which brought Faraday, Owen, and other distinguished scientists into personal contact with them.

The present advance in matters scientific seems to have come, to a great extent, as a result of the persevering efforts of followers of the medical art. The institution of practical classes in histology and embryology having proved a great success, suggestions were made to bring together in a single institution the different scientific collections belonging to the University, then scattered in rooms in various buildings, and so facilitate the study of natural and physical science. Ultimately, the new museum was erected, eighty acres of land near it being purchased to admit of future expansion and the development of a complete scientific institute, a working observatory was erected in the grounds, and steps were taken to organise a practical School of Medicine. A considerable part in the agitation was taken by Sir Henry W. Acland, Bart., D.C.L., F.R.S., etc., now Regius Professor of Medicine in the University of Oxford, and an esteemed honorary member of the Pharmaceutical Society. In company with others, he laboured hard to repair the mischief of two centuries ago, when physical science, driven from Oxford, found more congenial surroundings in London; and he now enjoys the gratification of seeing the University in the position of having regained its ancient opportunities for scientific work.

The new scientific institute contains excellent physical laboratories; the chemical department has not been stinted; geology, mineralogy, physiology, astronomy, geometry, mathematics, zoology, anatomy, and medicine receive proper attention, and this association of the workshops of the great departments of science has had its value intensified by the scientific library being transferred by the Radcliffe Trustees from the Camera Bodleiana to the new buildings.

Modern botany alone remains isolated, in the gardens near Magdalen Bridge.

The objects of the Museum, which may be regarded as the most comprehensive and complete institution in the world for the study of natural science, are thus summarised by Sir Henry Acland:—"First, to give the learner a general view of the planet on which he lives, of its constituent parts, and of the relations which it occupies as a world among worlds; and, secondly, to enable him to study, in the most complete scientific manner, any detailed portion which his powers qualify him to grasp. . . . For the illustration of Nature the student requires four things: first, a workroom, where he may practically see and work for himself; secondly, a lecture-room, where he may see and be taught that which by himself he can neither see nor learn, and, as an adjunct to these, a room for more private study for each; thirdly, general space for the common display of illustrative specimens, so placed as to be convenient for reference and comparison between all the different branches; and, lastly, a library, in which whatever has been done, or is now doing, in the science of this and other periods and countries, may be conveniently ascertained. . . . These varied requirements are here supplied."

It would thus appear that the determined efforts made by a number of Fellows of the University were fully justified by a large measure of success, and, in the course of some statements circulated in Convocation in 1876, it was pointed out that the University had entered upon a plan whereby its Department for Scientific Study and Research might in time become "unequalled, certainly unsurpassed, for convenience, completeness, and space for extension." The full results that may be produced by the study of natural science at Oxford remain yet to be seen, but that the professions whose foundations rest on such study have received a powerful impulse is clearly indicated by the present position of the medical faculty of the University, whose degrees rank second to none. That such progress may continue and be accelerated will be earnestly desired by all who have at heart the best interests of humanity.

In concluding this brief and necessarily imperfect account of the University buildings, which may be regarded as indicating the different high-water marks of knowledge during the past six hundred years, no more fitting words can be written than the passage in which Goldwin Smith sums up his interesting outline of the history of the University and the Colleges affiliated with it. "The buildings stand, to mark by their varying architecture the succession of the changeful centuries through which the University has passed. In the Libraries are the monuments of the successive generations of learning. But the tide of youthful life that from age to age has flowed through college, quadrangle, hall, and chamber, through University examination rooms and Convocation Houses, has left no memorials of itself except the entries in the University and College books. . . . Youthful effort, ambition, aspiration, hope, College character and friendship have no artist to paint them—at least as yet they have had none. But whatever of poetry belongs to them is present in full measure here."

FRUIT JUICES AND SYRUPS.

A typical formula for preparing a concentrated fruit syrup may be found in the U.S. Pharmacopœia, namely, syrup of raspberry:—

"SYRUPUS RUBI IDÆI.

"Syrup of Raspberry.

"Fresh, ripe raspberries, any convenient quantity. Sugar, a sufficient quantity.

"Reduce the Raspberries to a pulp, and let this stand, at a temperature of about 20° C. (68° F.), until a small portion of the filtered juice mixes clear with half its volume of alcohol. Then separate the juice by pressing, set it aside in a cool place, until the liquid portion has become clear, and filter. To every forty (40) parts by weight of the filtrate (which should not be allowed to remain, unprotected by sugar, more than about two hours) add sixty (60) parts of sugar, heat the mixture to boiling, avoiding the use of tinned vessels, and strain. Keep the product in well-stoppered bottles, in a cool and dark place."

This is the process of the German Pharmacopœia, except that the latter directs 65 parts of sugar for every 35 parts of filtered juice. The temperature during fermentation prescribed by the U.S.P. should be maintained as nearly as possible. The French Codex directs fermentation to proceed at between 12° and 15° C. (54°–59° F.). Other fruit syrups may be prepared according to the same method. It may be explained that the fermentation is for the purpose of precipitating the pectin present, which otherwise interferes with filtration. The addition of alcohol is for the purpose of hastening this process, and also to aid slightly in the temporary preservation of the juice, to avoid acetic fermentation and fungoid growths. It is also believed that by this process of fermentation the aroma is more fully developed, especially in strawberry juice. Fermentation should proceed for about twenty-four to thirty-six hours.

It is important for the keeping quality of fruit juices that they be perfectly clear and bright, while in the case of the syrups, when boiled, all scum forming must carefully be removed by straining, having avoided all stirring while the liquid comes to a boil. Sometimes fermented fruit juices remain turbid and difficult to filter; to these a small quantity of skimmed milk may be added, which will be coagulated by the acids present, and thus act as a clarifier. Paper pulp will sometimes prove desirable for clarifying. Only the very best grade of sugar should be employed. The containers should be perfectly sterile and dry, the latter condition being insured by rinsing with alcohol.

When boiling hot syrup is poured into the bottles, the latter should stand on several thicknesses of cloth wet with cold water, to prevent cracking. Cork immediately, tie over, dip into sealing wax, and lay flat, and allow to cool off in that position; in fact, they should remain thus until opened, to insure preservation.

The different formulas printed below have been collected from various sources. The "Appert" process there mentioned is nothing but what is now

called sterilising. The bottles are filled, allowing enough space for expansion of the contents when hot, the corks are inserted and securely fastened with twine. They are then placed into a vessel with cold water reaching up to their necks, standing on a false bottom or a layer of straw. The temperature of the water bath is gradually raised, and finally the boiling point maintained for 10–15 minutes. Removing from the bath, the tops are sealed over and the bottles allowed to cool in a reclining position. Some prefer to insert the corks only after sterilisation is complete. This involves less danger as to explosions, but is rather less reliable.

Syrup of Raspberry.—Contuse the berries, place them in a vat, add 2 per cent. of sugar, and ferment the mass at a temperature of between 70° and 80° F. for three or four days until all pectin has separated and no more signs of fermentation are visible. Then express the juice, which allow to settle in a cool place for two days, decant carefully from the pulverulent pectin, and filter. Preserve the juice by Appert's process, or convert into syrup by dissolving in 5 parts of the clarified juice 9 parts sugar, and heating to the boiling point.

2. A better and safer way is to add at once to the freshly bruised fruit 5 to 6 per cent. of alcohol, and then proceed as in the foregoing. This formula would seem to deserve preference.

3. Crush the raspberries in a glass vessel with a wooden pestle to a pulp, add to it 5 to 10 per cent. of cane or grape sugar, and allow the whole to stand, stirring occasionally. When the mass ferments the juice becomes clear, when it may be filtered and bottled, or converted into syrup.

4. Put six pounds of raspberries into a china bowl, with a quart of water, in which has been dissolved 2½ ounces of citric acid, and let it remain twenty-four hours; then strain, taking care not to bruise the fruit. To each pint of clear liquid add 1½ pound of sugar, and stir until it is dissolved.

5. Proceed as in No. 1. When the fermentation is nearly ended express the juice, add to every pound of the latter 1 ounce of the deodorised alcohol, set aside for one night, and then filter. Bottle the juice or convert into syrup.

6. Macerate the berries interspersed with sugar, 1½ pound of sugar to 1 pound of berries, for twenty-four hours in a cool cellar, and then drain off the juice. Preserve the syrup by means of Appert's process.

7. Add to the foregoing product some alcohol, or a little bisulphite of lime. The flavour is not supposed to be impaired by the latter.

8. Pure fruit juice, 16 fluid ounces; dilute acetic acid, 1 fluid ounce; water, 7 fluid ounces; granulated sugar, 3 pounds. Dissolve the sugar without heat. Preserve in air-tight vessels in a cool place. The acetic acid is objectionable.

Syrup of Mulberry.—Mulberry juice, 1 pint imp.; sugar, 2 pounds; strong alcohol, 2½ fluid ounces. Heat the juice to the boiling point, and when it has cooled filter it. Dissolve the sugar in the filtered liquid with a gentle heat, and add the spirit.

Syrup of Strawberry.—Put 2 parts of strawberries

deprived of the calyx, without crushing them, into a large-mouthed jar; add to them $2\frac{1}{2}$ parts of sugar, and frequently shake, keeping the vessel in a cool place. The sugar absorbs the juice, leaving the fruit shrivelled and tasteless, the latter being removed by means of a strainer without pressure. Mix the clear syrup with 20 per cent. of alcohol.

Syrup of Cherry.—Employ the black, sour variety. Crush the cherries, together with the stones, and follow the directions given in No. 2.

Fruit Syrup for Lemonade.—Raspberries, 1000 grammes; blackberries, 500; bilberries, 500; lemons, 3 fruits. Mash in a stone mortar, and add of cold water, 1500. Let stand for three days, or until fermentation has finished. Express and filter. In every 2500 dissolve citric acid, 40; and sugar, 4500. Boil up once in a copper kettle. — *Western Druggist.*

HYDRASTIS CANADENSIS.*

BY DR. J. POHL.

Hydrastis canadensis (Golden Seal) flourishes in moist and shady woods in North America, and perishes when the woods are cleared. Seeds planted in the spring germinate in May, and produce seedlings with a dull yellow tap-root and deep yellow hypo-cotyledonary stem. In the second year four or five alternate cataphyllary leaves are developed, and also three foliage leaves, of which, however, only one is fully expanded. During the following years the plant continues to grow in a similar manner until the aerial axis finally produces a terminal flower at its apex. In this stage the plant possesses a rhizome with four or five cataphyllary leaves and short internodes. In the axils of these leaves buds are formed, of which the third one usually develops into a branch, which may either flower in the following year or may continue for some years to produce foliage leaves only. Branches may also be formed by adventitious buds on the roots.

The fresh rhizome is about two inches long and a quarter of an inch thick, branching, provided with numerous roots on its sides and lower surface, and deeply constricted at intervals into segments, each of which represents a year's growth. In the depressions the remains of the fibrovascular bundles of the foliage leaves can be observed, whilst the minute rings on the segments themselves are the scars left by the cataphyllary leaves.

In the fresh root (both in primary and secondary tissue) the berberine is contained exclusively in the vacuoles of the cells of the hypodermis and endodermis, and those of isolated parenchymatous cells lying closely applied to the xylem bundles; the vessels contain no berberine. In the rhizome the parenchymatous cells with berberine are extremely abundant immediately below the cork cambium and in the cortical parenchyma; they also occur scattered round the vessels. In the aerial axis the berberine is mostly confined to axially elongated parenchymatous cells near the fibrovascular bundles.

On anatomical grounds exception is taken to the opinion of Prantl that the genus *Hydrastis* is allied to *Pæonia*; it is more nearly allied to *Thalictrum*, as they both contain berberine, form a perennial rhizome, possess a caducous perianth, and show similarity in other respects.

The drug consists of the entire plant with the exception of the foliage leaves and part of the aerial axis; it contains rhizome, root, cataphyllary leaves and part of the aerial axis. The anatomical characters are identical with those of the fresh drug, but the localization of the berberine is abnormal, inasmuch as it has permeated nearly the whole of the tissue.

Of all the substitutions, the rhizome of *Jeffersonia diphylla*, Pers., alone bears some similarity to *Hydrastis*. It is easily distinguished by the stone cells which occur in groups in the cortex, and as a ring in the petioles, and by the absence of cells containing berberine.

British Pharmaceutical Conference.

TITLES OF PAPERS TO BE READ AT THE OXFORD MEETING.

The following is a provisional list of the papers promised:—

1. Report on the Constituents of the Root of *Hemidesmus indicus*, by H. Bowden.
2. Note on Coco-nut Stearin as a Basis for Suppositories, by C. J. S. Thompson.
3. Conditions of Papain Digestion, by S. Rideal, D.Sc. Lond., F.I.C.
4. The Recovery of Residual Tinctures from Marcs, by R. H. Parker, F.C.S.
5. Note on Phosphorus Pills, by R. H. Parker, F.C.S.
6. Note on the Stability of the Alkaloidal Tinctures, by E. H. Farr and R. Wright, F.C.S.
7. Gravimetric and Volumetric Methods for the Determination of the Alkaloids in Alkaloidal Tinctures, by E. H. Farr and R. Wright, F.C.S.
8. Tincture of Iodine and its Analysis, by J. F. Liverseege, F.I.C.
9. Tincture Ergotæ Ammoniatæ, by J. T. Hornblower.
10. Remarks on Gnetum, by W. Elborne, B.A. Cantab.
11. Some Fallacies in the Testing of Essence of Lemon, by Arthur A. Barrett.
12. Note on *Strychnos ignatia*, by F. Ransom, F.C.S.
13. A New and more Economical Process for Ext. Nucis Vomice, by C. W. Lucas, F.C.S.
14. The Adaptation of the Soap Basis of Lin. Pot. Iodid. & Sapone to some other B.P. Linimenta, by C. W. Lucas, F.C.S.
15. Notes on Rhubarb, by Barnard S. Proctor, F.I.C.
16. Examination of *Leonurus cardiaca*, by W. A. H. Naylor.
17. Animal Extracts, by C. E. Stuart, B.Sc.

* Abstracted from *Bibliotheca Botanica*, No. 29.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JULY 14, 1894.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.C.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMERIDGE, Secretary, 16, Bloomsbury Square, London, W.C.

Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STREET BROTHERS."

SOCIETY OF CHEMICAL INDUSTRY.

THE annual general meeting of this Society, to be held in Edinburgh next week, should have more than ordinary interest for the readers of the Journal, inasmuch as the President of the Society, Mr. E. C. C. STAFFORD, is a pharmaceutical chemist and a member of the Pharmaceutical Society. Although now engaged in the management of chemical works in Scotland, Mr. STAFFORD was formerly more closely connected with pharmacy, having been a student in the School at Bloomsbury Square, and for some time Demonstrator in the Society's Laboratory under the late Professor REDWOOD. Two years ago Mr. STAFFORD was President of the British Pharmaceutical Conference, and in the address delivered by him at Edinburgh it was very evident that his interest in the well-being of pharmacy and pharmacists had not been weakened by the transfer of his activity to other pursuits.

The meeting of the Society of Chemical Industry, over which Mr. STAFFORD will preside at Edinburgh, promises to be one of considerable interest. For the purpose of making arrangements for it, the Scottish section of the Society has formed a very influential committee, the chairman of which is the Lord Provost of Edinburgh, the Right Hon. Sir JAMES A. RUSSELL. Provision has been made to afford visitors the opportunity of inspecting many of the industrial establishments of Edinburgh and its neighbourhood, and also for excursions to places of interest in Scotland. A local ladies' committee has also been formed, to assist in the work of entertaining visitors, and on the occasion of the dinner on Thursday evening it is intended to hold a ladies' reception and conversazione in the Victoria Hall.

The presidential address will be delivered in the Queen Street Hall at 11 a.m. on Wednesday, July 18. After the conclusion of business at the meeting, arrangements have been made to visit the local galleries and museums, Dalmeny Palace, Roslyn, Dalkeith Palace and grounds, or the paper

works at Valleyfield and Eskmills. In the afternoon a garden party will be given by the Lord Provost, at his residence, Woodville, Canaan Lane, Granton. In the evening a reception and conversazione will be held by the Lord Provost, Magistrates, and Council of the City of Edinburgh, in the Museum of Science and Art. On the following day a large number of works of various kinds will be open for inspection, in addition to Leith Docks, and at 1 p.m. a special train will convey visitors from the Waverley Station to Granton, in connection with a steamer proceeding to the Forth Bridge. On returning to Granton, Messrs. A. B. FLEMING AND CO. will give a garden party at Royston, and the special train will return to Edinburgh at 6 p.m. The annual dinner will be held the same evening, at 7.30 p.m., in the Waterloo Hotel. On Friday, excursions to Loch Tay, St. Andrew's and Perth, will be followed by a smoking concert in the Waterloo Hotel at 9 p.m.

WINE AS MEDICINE.

THE suggestion that a chemist supplying the B.P. wine of iron might be placed in a position of liability to a fine for having infringed the Revenue Acts appears to involve the somewhat exaggerated and, as we think, unfounded opinion that the Inland Revenue authorities are disposed to interfere with chemists in the regular conduct of their business. In regard to the supply of wine, there is no statutory exemption from the necessity for a licence, even when the wine is to be used as medicine, but we are not aware of any instance in which the Board of Inland Revenue has sought to make the supply of wine as medicine amenable to the law. On the contrary, it has recognised the fact that certain forms of wine are medicinal preparations, and has consented to allow their supply by chemists without a wine licence, provided the wine be of such a nature as not to be capable of being used as a beverage. That position, while having regard for the object of the Revenue Acts, is in conformity with the evident intention of those Acts to distinguish between the supply of wine or spirituous liquors as a matter of ordinary trade and their reasonable supply as medicine. The same desire to distinguish between ordinary trade transactions and the proper prescription or supply of medicine is also manifested in the Medicine Stamp Act. The distinction thus drawn is an important one, and it appears to be the only ground upon which practical exemption from statutory provisions can be expected by chemists or medical men, and acceded to by the Inland Revenue authorities. The fact that an article is in the British Pharmacopoeia is a matter of little importance in this respect. Spiritus vini gallici is an article of the British Pharmacopoeia which may be dispensed in the form of the corresponding mistura, in the

ordinary course of the chemist's professional practice; but if the same preparation were supplied in a more liberal manner there might be ample ground for regarding the practice so closely analogous to that of the publican as to involve equal necessity for a licence.

The difficulty experienced by the chemist arises from the mixed nature of his business. We do not apprehend that the exercise of its strictly professional part would ever be interfered with by the Inland Revenue authorities. But if the chemist, in the sale of wine or medicine, gives undue prominence to his position as a trader, and thus voluntarily brings himself within the scope of statutory provisions relating to trade, he cannot in that capacity expect exceptional consideration.

The mistake has been made of assuming—on the ground of an overstrained interpretation of statutory provisions—that exemptions intended to have a limited application might be extended to transactions of a purely trade character.

THE PROPOSED IMPERIAL BRITISH PHARMACOPOEIA.

THE editor of the *Montreal Pharmaceutical Journal* speaks with regret of the indifference with which this project has been received by Canadian pharmacists, and directs attention to a letter on the subject from Mr. J. E. D'AVIGNON, of Windsor, Ontario, in which he points out that the Ontario Pharmacy Act and the Dominion Inland Revenue Act recognise the British Pharmacopoeia, but there is some doubt whether it is, under the latter Act, really a compulsory legal standard for the preparation of medicines. From a practical point of view he mentions that many preparations of the B.P. are not used at all in Canada, and that some of those in use there are not in the B.P. Canadian pharmacists adhere pretty closely to the B.P., and the U.S.P. is chiefly followed in the case of preparations not mentioned in the B.P. Not long ago a committee was appointed by the Ontario College of Pharmacy to consider the establishment of a uniform pharmaceutical standard for the whole dominion, and to confer with committees of other colleges on this subject. In connection with that object a special Canadian Pharmacopoeia has been suggested, but Mr. D'AVIGNON does not think it would be practicable or advisable, and he is disposed to favour the idea of an Imperial British Pharmacopoeia providing, if necessary, for the particular requirements of Canada or other colonies in appendices. The *Australasian Journal of Pharmacy* also has an article on this subject, in which the project is favourably spoken of, but at present no steps appear to have been taken in regard to it by pharmacists in the Australian colonies.

The sub-committee of the Melbourne branch of

the British Medical Association, appointed to draw up a report on the subject in accordance with the request of the General Medical Council, has held two meetings, and at the last Baron Sir FERDINAND von MÜLLER drew attention to some of the indigenous Australian plants useful in medicine, especially that known as "pituri," and yielding duboisine. He also pointed out that while it has hitherto been a peculiarity of the British Pharmacopoeia to direct that various essential oils should be derived from plants grown in Great Britain, the climate of Victoria is particularly suitable for the growth and cultivation of most of the plants yielding such essential oils. He considered that it would therefore be desirable to obtain authority to make use of plants grown in the colony for pharmaceutical purposes. Red gum, now very extensively used, and the wattle bark, containing a larger amount of tannin than oak bark, were also mentioned as important items among the natural products of the Australian Colonies.

ADULTERATION OF DRUGS.

THE Parliamentary Committee appointed last month to inquire into the subject of adulteration has now commenced its sittings, and it may be expected that the evidence given before it will lead to some important amendment of the existing Act. Though chemists, as a body, have not been to any considerable extent directly affected by the provisions of the Act, they are indirectly affected by the sale of impure or adulterated drugs and medicinal preparations of inferior quality, which is extensively carried on by persons who are not legally qualified chemists. The reports of the Local Government Board, in which the returns of public analysts are summarised, do not give any information as to the kind of shops where adulterated drugs have been sold and made the subject of prosecution under the Act, although there is reason for believing that such sales generally take place in the shops of unqualified persons. A case of this kind has recently occurred at Leeds, and from the report at page 37 it will be seen that ground existed for the warning recently given as to the sale of arsenical glycerin. This case will figure as one of conviction for the sale of an adulterated drug, and as the proper vendors of such articles are registered chemists, it will appear to reflect upon the mode in which they carry on their business. As Mr. FAIRLEY justly stated, there is no reason why glycerin, sold as a drug, should contain arsenic. It ought never to do so, and it is the business of competent chemists to ascertain that neither that nor any other drug they sell is impure or adulterated. The grocer, who supplies commodities upon a very different footing, cannot be expected to ascertain whether such articles are of the

substance, nature, and quality required, and he has as little right to deal in them at all as he has to assume that no possible harm can arise from the presence of arsenic in glycerin.

PHARMACEUTICAL ORGANISATION.

It may be inferred from the proceedings at the last meeting of the Glasgow and West of Scotland Pharmaceutical Association that there is a desire to improve the practice of pharmacy in that city, and put an end to the unsatisfactory conditions which have prevailed there for many years. The remarks made by Mr. ANDERSON RUSSELL, in bringing forward a motion containing suggestions for more effective organisation of those engaged in the business and better regulation of its exercise, do not admit of being commented upon, because the motion was only formally seconded, and the discussion of its details was adjourned. But we cannot do less than express our opinion that the motive underlying Mr. RUSSELL's suggestions is eminently commendable, however much their practical achievement may be a matter for the future to realise. It may be that many will regard the ethical principle embodied in those suggestions as a purely sentimental idea, incompatible with the hard necessities of daily experience; but we trust that there will also be an adequate appreciation of the exceptional nature of the pharmacist's business, and of the corresponding necessity of its internal regulation from a professional point of view, in order to raise it above the lines upon which ordinary trade is conducted. That, as we understand Mr. RUSSELL, is his aim, and in so far as his suggestions may be conducive to its attainment, they should meet with the hearty support of every registered chemist and druggist.

URINE TESTING.

An important point in connection with the detection of sugar in urine has been dealt with by Sir GEORGE JOHNSON in a paper published in last week's *Lancet*, and as the subject is one of great practical interest to pharmacists, the paper has been reprinted in full at page 24.

PRESENTATION TO MR. E. F. HARRISON.

At the last meeting for the session of the School of Pharmacy Students' Association (see p. 37), the President, Professor ATTFIELD, on behalf of present and past members, presented to Mr. E. F. HARRISON, Assistant-Lecturer in Chemistry, a watch and a framed photograph of the present students and staff of the School of Pharmacy, in recognition of his services in various capacities.

THE ARMSON CASE.

At the moment of going to press, the hearing of the further appeal in this case came on for hearing before the Master of the Rolls, Lords Justices KAY and A. L. SMITH. The facts of the case have already been reported in the *Journal* (see liii., p. 675) as well as the judgment delivered in the Derby County Court by His Honour Judge DIGBY (*Ibid.*, p. 768), and that of Justices CHARLES and BRUCE (*Ibid.*, p. 907) in the appeal of the defendants to the Queen's Bench Divisional Court. As it is impracticable to report the case without delaying the

issue of the *Journal*, we can only state that it is proceeding, and that a full report will appear in next week's *Journal*.

ROYAL SOCIETY OF NEW SOUTH WALES.

THIS Society offers its medal and £25 for the best communication (provided it be of sufficient merit) containing the results of original work or observation upon each of the following subjects:—

Series XIV.—To be sent in not later than May 1, 1895.

No. 46.—On the Silver Ore Deposits of New South Wales.

No. 47.—On the Physiological Action of the Poison of any Australian Snake, Spider, or Tick.

No. 48.—On the Chemistry of the Australian Gums and Resins.

Series XV.—To be sent in not later than May 1, 1896.

No. 49.—On the origin of Multiple Hydatids in man.

No. 50.—On the Occurrence of Precious Stones in New South Wales, with a description of the Deposits in which they are found.

No. 51.—On the effect of the Australian Climate on the Physical Development of the Australian-born Population.

The competition is in no way confined to members of the Society, nor to residents in Australia, but is open to all without any restriction whatever, excepting that a prize will not be awarded to a member of the Council for the time being; neither will an award be made for a mere compilation, however meritorious in its way. The communication, to be successful, must be either wholly or in part the result of original observation or research on the part of the contributor. The Society is fully sensible that the money value of the prize will not repay an investigator for the expenditure of his time and labour, but it is hoped that the honour will be regarded as a sufficient inducement and reward. The successful papers will be published in the Society's annual volume. Fifty reprint copies will be furnished to the author free of expense. Competitors are requested to write upon foolscap paper—on one side only. A motto must be used instead of the writer's name, and each paper must be accompanied by a sealed envelope bearing the motto outside, and containing the writer's name and address inside. All communications to be addressed to the Honorary Secretaries, Messrs. T. W. E. DAVIN and J. H. MAIDEN, 5, Elizabeth Street, Sydney, New South Wales.

BRITISH PHARMACEUTICAL CONFERENCE.

THOUGH the members of the Conference will each receive a copy of the "pink circular," describing the arrangements made by the local committee in connection with the Oxford meeting, it may prevent misapprehension and some inconvenience to state that the price of one of the books of tickets is more than usual. The No. 1 book admits to the receptions, luncheons, and smoking concert, and No. 2 covers the boat fare, luncheon, and tea on the Thursday. The price of each book will be 10s. 6d., and, as stated last week, application for them should be made to the Honorary Local Secretary, Mr. HENRY MATHEWS, 108, High Street, Oxford, not later than July 23.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At the meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 11th inst., the Librarian and Curator presented the following report of donations to the Society's Libraries and Museums:—

To the Library in London.

Royal Society of London:

Catalogue of scientific papers, vol. 10.

Royal Dublin Society:

Scientific transactions, vol. 4, pt. 14; vol. 5, pts. 1-4.

Scientific proceedings, vol. 7, pt. 5; vol. 8, pts. 1-2.

Dr. Louis Planchon, Montpellier:

Produits fournis à la matière médicale par la famille des apocynées, 1894.

Étude sur les produits de la famille des sapotées, 1888.

Les orchidées à coumarine le faham et ses succédanés, 1892.

Tableau des caractères des principales écorces de quinquinas américains, 1894.

To the Library in Edinburgh.

Mr. Alexander Sutherland, Edinburgh:

Botanical terminology, by G. N. Lloyd, 1826.

To the Museum in London.

Professor H. H. Rusby, M.D., New York:

Specimens of genuine and false Cascara Sagrada, Saigon Cinnamon, American *Acorus calamus* rhizome, Peeled Male Fern rhizome, Liquorice root from Alicante, Calabria, and Anatolia, and Tomé bark from Bolivia.

Messrs. Evans, Lescher, and Webb, London:

Large Specimen of the leaves of *Pilocarpus microphyllus*, and a specimen of uncured Vanilla from Maranhão.

Mr. J. Whitehead, Bromley, Kent:

Specimens of medicinal fruits and roots collected in the Philippine Islands.

Messrs. Wilson, Smithett and Co.:

Specimen of Kusunoki bark from Japan.

Mr. H. E. Rouquette, London:

Specimens of a wood and herb used as perfumes by the Kaffirs in Natal.

Mr. F. Coles, London:

Specimen of the root of *Sanocephalus esculentus*.

To the Herbarium.

Professor H. H. Rusby, M.D., New York:

Specimens of *Erythroxylon bangii*, of nearly wild and cultivated *Erythroxylon coca*, *Dodonaea viscosa*, *Manihot aipi*, *Argemone mexicana*, *Chenopodium quinoa*, *Krameria triandra*, *Piper angustifolium*, and 7 varieties of the cotton-plant.

The Director, Royal Gardens, Kew:

Five specimens of *Balsamodendron* from the Bent Expedition to Hadramaut.

Baron F. von Mueller, Melbourne:

Twenty Australian plants.

To the Museum in Edinburgh.

Mr. Alexander Sutherland, Edinburgh:

Stems of *Acacia*, *Catechu*, and *Santalum album*, seeds of *Gynocardia odorata*, *Anacardium occidentale*, and *Trapa spinosa*.

Messrs. Hodgkinson, Treacher, and Clarke, London:

Essential oil of asafoetida.

Mr. Alexander Strachan, Edinburgh:

Australian eucalyptus oil.

Mr. Thomas Stephenson, Bombay:

The Herbarium of British plants which gained the Society's bronze medal in 1883.

MAJOR EXAMINATION QUESTIONS.

BOTANY.

July 6.—Hours from 10 a.m. to 1 p.m.

1. Give the characteristics of the Natural Order Solanaceæ, and contrast them with those of the Scrophulariaceæ. Give their floral diagrams. Mention the important indigenous genera of the Solanaceæ.
2. In what important feature do algae differ from fungi? Give a short account of the life history of *Claviceps purpurea*.
3. Describe the structure of a living parenchymatous plant cell, by what means does it multiply? What chemical elements enter into the composition of the cell-wall, and the protoplasm? What change does the cell-wall undergo in the formation of cork?
4. Give an instance of a self-fertilised plant. Explain how this is prevented (a) in dichogamous flowers, (b) in proterandrous flowers, (c) in protogynous flowers, (d) in self-sterile flowers, and (e) in heterostylous flowers.
5. Examine and report upon the microscopic sections supplied.

MATERIA MEDICA.

July 6.—Hours from 2 to 5 p.m.

1. From what substances can Benzoic Acid be obtained? How may it be distinguished from Cinnamic Acid? What is its chemical relation to the purified oil of bitter almonds? Give tests for its purity and its chemical formula.
2. Discuss the B.P. process for the preparation of Tannic Acid. Give tests which shall ensure the purity of the Acid. State what chemical relation it bears to Gallic Acid. How may they be distinguished?
3. How can Sulphate of Quinidine be detected in Sulphate of Quinine? Give the physical, chemical, and optical characters of the two substances.
4. What is Sparteine? How can it be obtained? Can crystallisable salts of it be formed?
5. How can Oleum Sinapis be obtained? Discuss its formation and chemical constitution. What is its specific gravity?

CHEMISTRY.

July 7.—Hours from 10 a.m. to 1 p.m.

1. What are the distinguishing characters of the nitro-phenols? Give a detailed account of the process you would adopt for their preparation in a pure state.
2. How may the composition of ammonia gas be demonstrated?
3. Give the constitutional formulæ, methods of preparation, and characters of the dihydroxybenzenes.
4. By what means may hydrocarbons of the C_nH_{2n-2} series be converted into those of the C_nH_{2n+2} series? Give an example.
5. What weight of oxygen is required for the complete combustion of one gramme of olefiant gas? What volume would the resulting mixture occupy at 200° C. and 760 m.m. pressure?

PHYSICS.

July 7.—Hours from 2 to 5 p.m.

1. Write a short paper on magnetic induction, describing and explaining experiments in illustration.
2. Define the following expressions:—*Magnetic field*, *magnetic moment*, and *intensity of magnetisation* of a magnet.
3. What is double refraction? Give an example.
4. Describe fully the construction of Rutherford's maximum and minimum thermometers.

5. Explain briefly the principles of the following processes in ordinary "silver" photography:—

- (a) "Exposure of the plate."
- (b) "Developing."
- (c) "Fixing."
- (d) "Printing."
- (e) "Toning."

FIRST EXAMINATION QUESTIONS.

July 10, 1894.

LATIN.

Time allowed—from 11 a.m. to 12.30 p.m.

I. (For all Candidates.) Translate into Latin:—

1. The gift delights the brave sailor's children.
2. The cities were being fortified with high walls.
3. It is the duty of good citizens to obey the laws.
4. We eat to live; we do not live to eat.
5. Who is there who does not pity those who have been falsely condemned to death?

II. Translate into English either A (Caesar) or B (Virgil).

(Candidates must not attempt both authors.)

A. CAESAR.

1. Haec eodem tempore Caesar mandata referre bantur, et legati ab Aeduis et a Trevis veniebant: Aedui, questum, quod Harudes, qui nuper in Galliam transportati essent, fines eorum popularentur; sese ne obaidibus quidem datis pacem Ariovisti redimere potuissent; Treviri autem, pagos centum Suevorum ad ripas Rheni concessisse, qui Rhenum transire conarentur; his praeesse Nasum et Cimberium fratres. Quibus rebus Caesar vehementer commotus maturandum sibi existimavit, ne, si nova manus Suevorum cum veteribus copiis Ariovisti sese conjunxisset, minus facile resisti posset.

2. Eorum satisfactione accepta, et itinere exquisito per Divitiacum, quod ex aliis ei maximam fidem habebat, ut milium amplius quinquaginta circuitu locis apertis exercitum duceret, de quarta vigilia, ut dixerat, profectus est. Septimo die, quum iter non intermitteret, ab exploratoribus certior factus est, Ariovisti copias a nostris milibus passuum IV et XX abesse.

Grammatical Questions.

(For those only who take Caesar.)

1. Give the genitive singular, and the gender, of the following nouns:—*mare, fur, poema, nix, vox, portus, navis, os, es*.

2. Give the principal parts of all the verbs in Paragraph 2.

3. Parse fully—*Eorum satisfactione accepta*, and *quum iter non intermitteret* (Par. 2).

4. What is meant by the Sequence of Tenses? Give, in illustration, three sentences in English and Latin.

B. VIRGIL.

1. Aeneas scopulum interea conscendit et omnem Prospectum late pelago petit, Anthea si quem Jactatum vento videat, Phrygiisque bremis Aut Capyn aut celsis in puppibus arma Calci. Navem in conspectu nullam, lris litore cervos Prospicit errantes; hos tota armenta sequuntur A tergo, et longum per vallis pascitur agmen.

2. At Venus obscuro gradientes aëre saepit. Et multo nebulae circum dea fudit amictu, Cernere ne quis eos neu quis contingere posset Mollirve moram aut venient poscere causas. Ipsa Paphum sublimis abit, sedesque revisit Laeta suas, ubi templum illi, centumque Sabaeo Ture calant arae, sertisque recentibus halant.

Grammatical Questions.

(For those only who take Virgil.)

1. Give the genitive singular, and the gender, of the following nouns:—*mare, fur, poema, nix, vox, portus, navis, os, es*.

2. Give the principal parts of all the verbs in Paragraph 1.

3. Parse fully—*At Venus obscuro gradientes aëre saepit* (Par. 2).

4. What is meant by the Sequence of Tenses? Give, in illustration, three sentences in English and Latin.

ARITHMETIC.

Time allowed—from 12.30 p.m. to 2 p.m.

[The working of these questions, as well as the answers, must be written out in full.]

1. What is the cost of telegraphing to a distance of 3800 miles a message consisting of 300 English and 150 Persian words, at the rate of $\frac{1}{4}$ d. per mile for every 50 English and $\frac{1}{4}$ d. per mile for every 30 Persian words

2. If $\frac{2}{3}$ of $1\frac{1}{2}$ of an estate be worth £600, what will be the value of $\frac{2\frac{1}{2}}{1\frac{1}{4}}$ of the estate?

3. Express $\frac{3}{4}$ of $\frac{5}{6}$ of 9 days 16 hours + 0390625 of 10 days 16 hours as the decimal of 23 $\frac{1}{2}$ days.

4. A bankrupt's dividend being 11s. 11d. in the £, how much is lost by a creditor who has sold him 17 cwt. 0 qrs. 16 lbs. of goods at £1 2s. 6d. per cwt.?

5. A cistern is 4 metres long, 24 decimetres wide, and 80 centimetres deep: find its capacity in cubic metres.

6. If 5 $\frac{1}{2}$ per cent. would be gained by selling 121 lbs. for £26 11s. 10 $\frac{1}{2}$ d., at how much per lb. must it be sold to gain 12 per cent.?

7. Find how much money must be invested in a 4 per cent. stock at 104 $\frac{1}{2}$ to produce an income of £156 18s.

ENGLISH.

Time allowed—from 3 p.m. to 4.30 p.m.

1. Analyse:—

"Far above it on the steep,
Ruined stands the old chateau,
Nothing but the donjon keep
Left for shelter or for show.

2. Parse fully the following words in the passage above:—*Far, Ruined, Nothing, but, Left*.

3. Explain the meaning of the following prefixes, and write words formed by means of them:—*bi, anti, mis, dis, eu*.

4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—when thorbiorn held forth the sword all the other guardians praised it and said it was an excellent weapon but it had one grievous blemish for there was a notch in the edge oh said thorbiorn that notch is no blemish at all it is a memorial of one of my greatest achievements what was that asked one of the varangians.

*5. Write a short essay on any Town or Book with which you are acquainted.

JACOB BELL SCHOLARSHIPS, 1894.

Examination Questions.

Time allowed—Three hours (11 to 2.)

In awarding marks the neatness and legibility of the writing will be taken into account.

LATIN.

1. Translate into English:—

Saepe fugam Danaï Troia cupiere reliota
Moliri, et longo fessis discedere bello;
Fecissentque utinam! saepe illos aspera ponti
Interclusit hiems, et terruit Auster euntes.
Praecipue, quum iam hic trabibus contextus acinis
Staret equus, toto sonuerant aethere nimbi
Suspensi Euryppylum scintillantem oracla Phoebi
Mitimus; itque adytis haec tristitia dicta reportat;

* This must be attempted by every candidate.

"Sanguine placastis ventos et virgine caesa,
Quum primum Iliacas, Danaï, venistis ad oras;
Sanguine quaerendi reditus, animaque litandum
Argolica."

2. Translate into English:—

(a) Mitte collutorium, cum tanto aquae calidae utendum. Utere collyrio, nocte maneque, si non frequentius usurpando. Guttae tres subinde instillandae.

(b) Fiat destillatio à balneo arenae leni calore et vas excipiens bene refrigerando, donec circiter unciae septem transferint, quas in vase vitreo epistomio vitreo clauso serva.

3. Parse *placastis, contextus, scitantes*, and give the principal parts of these verbs. (Question 1.)

4. Translate into Latin:—

(a) Caesar sent messengers to the Lingones to tell them not to help the Helvetii with corn or anything else.

(b) Having by his iniquitous sentences filled the prisons with the most industrious and deserving of the people, he then proceeded to order numbers of Roman citizens to be strangled; so that the exclamation "I am a Roman citizen!" which has often in the most distant regions, and among the most barbarous people, been a protection, was of no service to them.

ENGLISH.

1. Parse fully:—

"Methought I heard a voice cry, 'Sleep no more!'"

2. Write a short essay on *one* of the following subjects:—

(a) "Variety's the very spice of life
That gives it all its flavour."

(b) "Content is a kingdom."

(c) The Educational value of Examinations.

ARITHMETIC.

1. Two numbers have for their Greatest Common Measure 537, and for their Least Common Multiple 18795. What must the greater be, if the less equals 105 times

$$\frac{2\frac{1}{2} \text{ of } 363\frac{1}{2}}{4\frac{1}{2} \quad 8\frac{1}{2}}$$

2. Add together £6025 of £1, 142857 of 14s. 10½d., and 2½ of 1s. of £3 5s. 1d.; and express the result as the decimal of 27 shillings.

3. If with 53·46 kilog. of thread a man can weave 231 mètres of linen 1·14 mètres broad, how many mètres of linen 95 metre broad can he weave with 75·6 kilog. of thread of the same quality?

FRENCH OR GERMAN.

The candidate is at liberty to choose either French or German, and is not required to show a knowledge of both. Marks will be awarded for one only.

French.

1. Translate into English:—

La mort de l'infortuné Louis XVI. avait causé en France une terreur profonde et en Europe un mélange d'étonnement et d'indignation. Comme l'avaient prévu les révolutionnaires les plus clairvoyants, la lutte se trouvait engagée sans retour, et toute retraite était irrévocablement fermée. Il fallait donc combattre la coalition des trônes et la vaincre ou périr sous ses coups. Aussi, dans l'assemblée aux Jacobins, partout on disait qu'on devait s'occuper uniquement de la défense extérieure, et dès cet instant les questions de guerre et de finance furent constamment à l'ordre du jour.

2. Translate into French:—

Edward the Third had spent a long time in trying to take the city of Calais, and when the citizens, almost starved, offered to surrender to him, he at first declared he would give no quarter; but at last he said

that, if six of the chief citizens came to him barefooted and bareheaded, with ropes about their necks, he would hang them, but spare all the rest.

German.

1. Translate into English:—

König Heinrich der Vierte ritt einmal ganz allein in der Nähe von Paris. Da kam ein anderer Reiter zu ihm her, ein Bauer vom Lande. Dieser kannte den König nicht. "Wo kommet Ihr her, guter Freund?" fragte Heinrich den Bauern; "Ihr habt gewiss Geschäfte in der Stadt?" "Ja," sagte der Bauer, "und ich möchte auch gerne den König sehen, der sein Volk liebt, wie ein Vater." "Das könnt Ihr leicht," antwortete Heinrich; "der, welcher den Hut auf dem Kopfe behält, wenn alle Leute den Hut abnehmen, der ist der König." So ritten sie in die Stadt, und alle Menschen nahmen den Hut ab. Da sah der Bauer, dass es der König sei, mit dem er ritt. Dieser aber lächelte und lud den Bauern zur Tafel ein.

2. Translate into German:—

Edward the Third had spent a long time in trying to take the city of Calais, and when the citizens, almost starved, offered to surrender to him, he at first declared he would give no quarter; but at last he said that, if six of the chief citizens came to him barefooted and bareheaded, with ropes about their necks, he would hang them, but spare all the rest.

CHEMISTRY.

What weight of phosphoric anhydride can be obtained from 100 litres of oxygen?

$$P = 31; O = 16.$$

How are the oxides of carbon made? Describe their chemical and physical properties.

PHARMACY.

Write a short account of the chief ointment bases.

Define the following:—Dialysis, Distillation, Sublimation, Rectification, Percolation. Name some products obtained by these processes.

BOTANY.

Describe in technical terms any common flower with which you are familiar.

Define the following:—Epiphyte, Parasite, Biennial, Phloem, Rhizome.

MANCHESTER PHARMACEUTICAL ASSOCIATION SCHOLARSHIP, 1894.

Examination Questions.

Time allowed—Three hours (11 to 2).

In awarding marks the neatness and legibility of the writing will be taken into account.

LATIN.

1. Translate into English:—

Quos ubi confertos audere in proelia vidi,
Incipio super his: Juvenes, fortissima frustra
Pectora, si vobis audentem extrema cupido
Certa sequi; quae sit rebus fortuna, videtis;
Excessere omnes adytis arislaque relictis
Di, quibus imperium hoc steterat; succurritis urbi
Incensae: moriamur, et in media arma ruamus.

2. Translate into English:—

(a) Mitte collutorium, cum tanto aquae calidae utendum Utere collyrio, nocte maneque, si non frequentius usurpando. Guttae tres subinde instillandae.

(b) Fiat destillatio à balneo arenae leni calore et vas excipiens bene refrigerando, donec circiter unciae septem transferint, quas in vase vitreo epistomio vitreo clauso serva.

3. Explain the construction of *vobis* and *adytis*. Give the principal parts of *confertos*, *audere*, *excessere*, *incensae*, *succurritis*. (Question 1).

4. Translate into Latin:—

(a) Jugurtha, after staying at Rome for some days, is reported to have said: "All things here are for sale."

(b) While we were thus talking to one another, we came to a spot in the forest where the grass was more green and bright, and the trees loftier and larger, than they are generally found to be in that part of Gaul.

FRENCH.

1. Parse fully:—

"At length the freshening western blast
Aside the shroud of battle cast."

2. Write a short essay on one of the following subjects:—

(a) "Virtue is the only good."

(b) Competition.

(c) "Self-reverence, self-knowledge, self-control,
These three alone lead life to sovereign power."

ARITHMETIC.

$$(3.71 - 1.908) \times 7.03$$

1. Simplify $2.2 - \frac{1}{4}$

2. Add together .00125 of a ton, .0125 cwt., and .025 lb.; and reduce the result to a decimal of 2 qrs. 9 lbs.

3. If 20 men can dig a trench 160 mètres long, 2 mètres broad, and 1 mètre 2 décim. deep in 8 days, in how many days can 24 men dig a trench 90 mètres long, 1 mètre 80 centim. broad, and 1 mètre 6 décim. deep?

FRENCH OR GERMAN.

The candidate is at liberty to choose either French or German, and is not required to show a knowledge of both. Marks will be awarded for one only.

French.

1. Translate into English:—

Un poète a dit que la vie était le rêve d'une ombre; il eût mieux fait de la comparer à une nuit de fièvre! Quelles alternatives d'agitation et de sommeil! que de malaises, de sursauts, de soifs renaissantes! quel chaos d'images douloureuses ou confuses! Toujours, entre le repos et la veille, on cherche en vain le calme, et l'on s'arrête au bord de l'activité. Les deux tiers de l'existence humaine se consomment à hésiter, et le dernier tiers s'en repentir.

2. Translate into French:—

I send you the new book which I promised you. I received it last week from my brother John before he went to America. It has been written by our uncle, and it tells us all about his travels in Germany. When you have finished it, please send it back to me at once, as my sister has not yet read it.

German.

1. Translate into English:—

Zwei kleine Mädchen gingen im Winter durch einen Wald, um ihre Tante zu besuchen, die auf dem Lande wohnte. Es fing an zu schneien, und sie konnten nicht mehr den Weg sehen, um weiter zu gehen. Da setzten sie sich unter einen Tannenbaum und schliefen ein. Die Eltern glaubten, die Kinder seien bei der Tante geblieben, und schickten den nächsten Morgen einen Diener, um sie holen zu lassen. Als der Diener hörte, dass die Kinder nicht angekommen waren, eilte er in den Wald, um sie zu suchen. Da fand er bei einem Schneehaufen ein Taschentuch, das einem der Kinder gehörte. Er schaufelte rasch den Schnee fort und fand die Kinder ruhig schlafen. Die Zweige des Tannenbaumes hatten ein Dach gebildet und der Schnee hatte sie warm gehalten.

2. Translate into German:—

I send you the new book which I promised you. I received it last week from my brother John before he went to America. It has been written by our uncle, and it tells us all about his travels in Germany. When you have finished it, please send it back to me at once, as my sister has not yet read it.

CHEMISTRY.

What weight of copper, when acted upon by sulphuric acid, will give 100 litres of sulphurous anhydride?

$$\text{Cu} = 63.4.$$

Chlorine is passed through solutions of the following:—Sodium Bromide, Sodium Sulphite, Sulphuretted Hydrogen. State what happens in each case, giving proofs.

PHARMACY.

How are hard, soft, and animal soaps made? Give a brief account of their uses.

State the methods you would employ for the removal of fixed oils, volatile oils, resins, oleo-resins, and albumin, from drugs.

BOTANY.

Give the chief points of difference between the flowers of Aconite, Larkspur, Foxglove, and Dead Nettle.

Write an account of the anther and pistil, and their functions.

Proceedings of Societies in London.

BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 17, Bloomsbury Square on Wednesday, July 4.

Present: Mr. N. H. Martin (President), Mr. Martindale (Vice-President), Mr. Moss (Treasurer), Messrs. Holmes and Farr, Mr. H. Mathews (Hon. Local Secretary), Messrs. Naylor and Ransom (Hon. General Secretaries), and Mr. Nightingale (Assistant Secretary).

Letters were received from Messrs. Atkins, Hayes, Gerrard, and Payne, regretting their inability to be present.

The minutes of the last meeting were read and confirmed.

A suggested list of officers for recommendation to the general meeting, for election for the ensuing year, was considered.

The place of meeting for 1895 also received some consideration.

The chairman of the Formulary Committee announced that the new edition of the "Unofficial Formulary" was now in type, and would be ready for presentation at the general meeting.

Mr. Mathews reported that the arrangements for the Oxford meeting were nearly completed.

Eleven gentlemen having been duly nominated were elected to membership.

ROYAL MICROSCOPICAL SOCIETY.

A meeting of this Society was held on June 20, Mr. A. W. Bennett, M.A., F.L.S., in the chair.

Dr. J. E. Talmage described his method for mounting and staining the brine shrimp, *Artemia fertilis*.

Dr. W. H. Dallinger called attention to a stereoscopic photomicrograph of injected muscle which had been presented by Dr. W. C. Borden.

Dr. Dallinger exhibited and described a new form of mechanical stage for the microscope which had been produced by Messrs. Swift.

Further remarks were made by the Chairman, Messrs. Comber, Swift, More, and Beck.

Mr. J. H. Harvey described a method of mounting opaque objects so that they could be moved in all directions whilst under examination.

Mr. T. Comber read a paper on the unreliability of certain characters generally accepted for specific diagnosis in the Diatomaceae.

A discussion ensued, in which the Chairman, Professor F. J. Bell, and Mr. J. Badcock took part.

Professor Bell gave a *résumé* of Mr. F. Chapman's sixth paper on the "Foraminifera of the Gault of Folkestone."

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The last meeting of the session was held on Thursday, June 28, Professor Attfield, F.R.S., President, in the chair.

The Secretary read the following:—

ANNUAL REPORT OF THE EXECUTIVE COMMITTEE.

"Your Executive Committee, appointed by vote of the Association at the commencement of the session in November last, have met and transacted business as follows:—

"At a meeting on December 7, 1893, the Committee received the Secretary's report that the usual nomination and voting papers had been issued at the commencement of the session to all members who had paid their subscriptions; also that the papers and reports of the previous session had been copied in type, and the bound copy had been presented to the Library of the Pharmaceutical Society.

"The following were appointed by your Committee as reporters on the sciences allied to pharmacy:—Pharmacy, Mr. W. Moore; Botany, Mr. E. Goulding; Materia Medica, Miss B. Shove; Physics, Mr. T. Tickle; Organic Chemistry, Mr. C. S. Ellis; Inorganic Chemistry, Mr. H. Garnett; Analytical Chemistry, Mr. R. H. Jones.

"At the same meeting a grant of seven shillings and sixpence from the Research Fund was made to Mr. C. E. Robinson to defray the expenses of his paper on "Commercial Jalaps and Jalapins," and at a meeting on January 25, 1894, a grant of seven shillings was made to Mr. H. B. Cox to meet the cost of the ether used in his experiments with tobaccos.

"On April 23 the Committee met and arranged suitable localities and dates for botanical excursions on Saturday afternoons; where practicable these were made to coincide with the excursions of the cricket club, separate excursions being made to Chislehurst and, by invitation of the President, to Watford. The members joining these excursions have been fewer than in the two previous years during which they have been in existence. The membership of the Association has also fallen off somewhat in comparison with the past two or three sessions; there are now sixty ordinary and nine life members as against seventy and eight respectively last session. The attendance at the meetings has, however, been good, and members have contributed freely to the papers and discussions. The number of meetings, including to night's, has been fourteen, and the total attendance 289, making an average of slightly over twenty at each meeting.

"The following twenty-seven communications have been read:—Introductory Address, by Mr. F. Ransom; 'Bees,' by Mr. A. T. Hill; 'Commercial Jalaps and Jalapins,' by Mr. C. E. Robinson; 'Note on a New Species of *Cascarilla*,' by Mr. A. W. Southall; 'Boron and its Compounds,' by Mr. T. A. Henry; 'Tobaccos,' by Mr. H. B. Cox; 'Gualacum Resin,' by Mr. E. L. N. St. Cyr; 'Linseed,' by Mr. H. A. Potter; 'Molybdenum and its Reactions,' by Mr. A. Lander; 'Report on Analytical Chemistry,' by Mr. R. H. Jones; 'Iodine and its Compounds,' by Mr. C. J. Taylor; 'Relation of the Chemist to the Practitioner,' by Mr. E. J. Kitson; 'Lead and its Salts,' by Mr. H. Boyce; 'Paper Manufacture,' by Mr. A. C. Bateson; 'Materia Medica of the Garden,' by Mr. H. A. Potter; 'Report on Pharmacy,' by Mr. W. Moore; 'Protoplasm,' by Mr. E. Goulding; 'Malt and Malting,' by Mr. A. E. Skinner; 'Aquatic Plants,' by Mr. C. E. Ashby; 'Report on Materia Medica,' by Miss B. Shove; 'Report on Organic Chemistry,' by Mr. C. S. Ellis; 'Leather and its Preparation,' by Mr. E. G. Gaul; 'The Flowers of the Month,' by Mr. E. E. Dolbear; 'Photo-Micrography,' by Mr. A. Lander; 'Capillarity,' by Mr. T.

Tickle; 'Early Chemistry,' by Mr. H. Burrows; 'Report on Inorganic Chemistry,' by Mr. H. Garnett.

"These papers are being copied in type and bound for presentation to the Pharmaceutical Society's Library, as in previous sessions.

"The Treasurer's accounts, to be presently audited, show that the receipts from members' subscriptions and interest on invested funds have amounted to £8 11s. 6d., and the expenditure to £6 19s. 3d., leaving a balance of £1 12s. 3d. to be added to the Research Fund. Grants to the extent of 14s. 6d. have been made from this fund, leaving a balance of £24 17s. 9d."

Mr. H. B. Cox and J. W. Ward were then appointed to audit the Treasurer's accounts, which they reported to be correct. The adoption of the report was thereupon moved by the Chairman, seconded by Mr. H. Burrows, and carried unanimously.

A vote of thanks to the President, officers, and reporters for their services was proposed by Mr. Guyer, seconded by Mr. C. J. Taylor, and carried by acclamation.

The President then, on behalf of present and past students, presented to Mr. E. F. Harrison, in view of his approaching departure, a watch and a large framed photograph of the present students and staff of the School, in recognition of his services as Assistant Lecturer in Chemistry, and in other capacities in the School. Mr. Harrison expressed his gratification at this evidence of the cordial relations which existed between the students and himself, and thanked them heartily for their present.

The meeting then terminated.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The fourth botanical excursion of the season took place on Wednesday, July 4, to Braid Burn, by suburban train to Morningside, at 6 a.m. The weather was fine, and a large number of plants were collected. It was unfortunate that there was a very small attendance of members, for the station offered very good opportunities for practical field work.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

ARSENIC IN GLYCERIN.

At the Leeds City Police Court, on July 6, before Mr. Vincent Thompson, the Deputy Stipendiary, John Trimble, trading as Hobson and Trimble, grocers and drysalters, Kirkstall Road, Leeds, was summoned at the instance of the Leeds Corporation for a breach of the Food and Drugs Act. Mr. Bairstow, instructed by the deputy town clerk (Mr. C. C. Jolliffe), prosecuted, and defendant conducted his own case.

In opening the case for the prosecution Mr. Bairstow said that glycerin which contained arsenic was being extensively sold in Leeds. For the purpose of testing the matter purchases were made from time to time. On the day in question Charles Gill, the assistant of the Inspector of Food and Drugs (Mr. Walker), went to the defendant's shop and asked for a bottle of glycerin from defendant's assistant. The latter asked, "Is it for inward or outward application," and Gill replied, "I want it for a friend." He was then sup-

plied with a pound bottle of glycerin, and Walker, entering the shop, informed him of the reason for the purchase in compliance with the conditions of the Act. The assistant refused to take advantage of the offer to take a portion of the glycerin for separate analysis. The glycerin was afterwards found to contain two grains of white arsenic per lb. Mr. Bairstow went on to refer to the section of the Act under which the proceedings were taken, and in reply to the magistrate said that he did not suppose anybody would take a pound of glycerin, but he did say that arsenic in the smallest quantities was injurious to health. He did not say that to take two teaspoonfuls would necessarily do any harm, but if a purchaser took home a bottle and allowed his children to take it great risk would be run of injury to health. If a grown-up person took the glycerin he would possibly have to take a considerable quantity before he was seriously injured. His argument was that if a person went into a shop and asked for glycerin he had a right to expect pure glycerin and nothing else, especially when it was labelled "pure glycerin," as was the case in this instance. Mr. Bairstow, continuing, said that there was no doubt that in this case the article supplied was to the prejudice of the purchaser, and was not of the substance, nature, and quality demanded by him.

The Magistrate: Was there any intimation on the bottle that it was for outward application only?

Mr. Bairstow, in reply, said that that was not the case, and that if the defendant had adopted that course there would be an end to these prosecutions against him.

Evidence of the sale having been given, Mr. Scattergood, surgeon, and Dr. Cameron, medical officer, spoke to the danger run in the sale of glycerin containing two grains of arsenic to the pound.

Mr. Fairley, city analyst, said he had analysed the glycerin in question, as well as other samples. Most of the samples were absolutely pure, with the exception of the defendant's, and there was no reason why there should be arsenic in glycerin at all. He was not aware that the process of procuring glycerin without arsenic affected the price of glycerin.

The Corporation Inspector, in reply to the Deputy Stipendiary, here stated that some of the samples that he had bought, and purchased at a penny less than that paid for the glycerin in question, had been proved to be without arsenic.

The defendant, addressing the Court, contended that he had not been fairly dealt with, inasmuch as when his assistant asked the purchaser if he wanted the glycerin for outward or inward use the purchaser did not answer the question, but evaded it by saying that he wanted it for a friend. That, he submitted, was a trap that had been unfairly laid for him. His defence was that the glycerin had been sold for outward use, and as such it was, he submitted, perfectly suitable. The glycerin was not sold to the prejudice of the purchaser, as it was sold for outward use. He felt sure that whatever impurity there might be in the glycerin was so small that no possible harm could arise from its outward use.

The court decided that the case had been proved against the defendant, and ordered him to pay a penalty of £3 and costs.—*Yorkshire Post*.

POISONING CASES AND INQUESTS.

SUPPOSED POISONING BY INFANTS' CORDIAL.

An inquest was held before Mr. D. Wightman, coroner, at Sheffield, on the body of Jane McKay, aged four days, who had died from the effects of a dose of infants' cordial, administered inadvertently.

Dr. Mathews said he was called in on Wednesday morning at one o'clock, when the child was in a state of coma. He then formed an opinion that she was suffering from a narcotic poison, probably a preparation of opium. He stayed with her four hours, keeping her alive by artificial respiration. The father of the child told him she had been given a cordial, and showed him a small bottle. He tasted the cordial, but could not detect the presence of opium. Any dose of opium would be dangerous for a child of the age of the deceased.

Replying to the coroner, witness said the child lived so long that the dose must have been very minute, and he did not think a chemical analysis would reveal the presence of opium. In his opinion the child died from a narcotic poison, although it was possible that she might have died from an affection of the kidneys.

Sarah Wright, a widow, said she gave the child some of Ibbotson's cordial on Tuesday night. The stuff had been bought two months previously from Mr. Percy Carr, chemist, Ecclesall Road. Not more than four drops were given the child, who appeared to get worse.

The coroner said he was satisfied that a post-mortem examination would not assist the jury in any way. There were very few of these cordials that did not contain opium. He did not think they would come to the conclusion that the woman intended to harm the child, as her conduct was undoubtedly actuated by kindness towards the mother. She no doubt gave the cordial to the child inadvertently, without any felonious intent. These children's mixtures were very nasty things, but they were widely used.

The jury returned a verdict "that the child died suddenly, death probably being accelerated by a dose of infants' syrup, administered by Mrs. Wright, but without any felonious intention."—*Sheffield Telegraph*.

Reviews and Notices of Books.

HANDWÖRTERBUCH DER PHARMACIE: Praktisches Handbuch für Apotheker, Aerzte, Medicinalbeamten und Droguisten. Edited by A. BRESTOWSKI. In 24 parts at 2 M. 40 Pf. each. (Vienna and Leipsic: Wilhelm Braumüller).

The publication of any work by which, with a minimum expenditure of time, a maximum of reliable information can be acquired, must of necessity be cordially welcomed. An excellent work of such a kind is the 'Dictionary of Pharmacy' now in course of publication under the auspices of A. Brestowski, assisted by a number of collaborators well-known in scientific circles. As the editor observes in his announcement, the rapid development of the numerous branches of the sciences with which pharmacy is connected renders it absolutely impossible for any one man to keep abreast of the advance in all. The object of the 'Dictionary' is to remedy easily and quickly the deficiencies thus necessarily occurring, and it is intended not only for pharmacists, but for pharmaceutical students, physicians, and others. The work is to be divided into two volumes, a first or general and a second or special part. The first volume, which is now appearing, is to be completed in about 24 parts.

The work appears to fulfil admirably the object of the editor. By the strict alphabetical arrangement of the matter, the numerous synonyms, and above all the distinct heavy type in which the titles

are printed, reference is immensely facilitated. Each article is well brought up to date, and the information conveyed in it will be found reliable, concise, and sufficient, three qualities the value of which for busy men can scarcely be over estimated. Of particular importance to pharmacists must be considered the prominence given to the newer synthetical remedies. For example, under "antipyrin" will be found a short account of its probable constitution, its preparation by Knorr, and that of an isomeric, if not identical, body by Böhringer, with the principal tests of identity and purity. Further, a number of substances with which it is incompatible and compounds into the composition of which it enters are indicated. The use, dose, and detection in the urine terminate an article included within the limits of three columns. Acetanilide is treated of in a similar but more concise manner, and the ten columns devoted to "proteids" contain a lucid description of the various bodies included under that name. Under "Mineral Waters" the chief springs and their properties are noticed, whilst a short account of the principal methods of food analysis occupies fifteen columns. Coffee and coffee substitutes, and wine and wine analysis, are treated of at length. The absence of illustrations is much to be regretted. Some articles include a short bibliography of the principal works bearing on the subject, an addition of great and obvious value which might with advantage have been more generally introduced.

Although the 'Dictionary of Pharmacy' appears close upon the heels of Moeller's 'Real Encyclopædia of Pharmacy,' it is a work quite distinct in character, and will be preferred by those who desire concise and later information; the latter advantage will probably be still more prominent in the second volume. Type and paper are all that could be desired, and the 'Dictionary of Pharmacy' can be strongly recommended to pharmacists who wish to provide themselves with a reliable work of reference on the lines that have been indicated.

Correspondence.

THE REVISION OF THE BRITISH PHARMACOPEIA.

Sir,—In answer to the letter of "Scotus," as speaking by experience, we have found that the average quality of English honey is so infinitely superior to the lower priced average Irish honey, it would be vexatious if there were no distinction.

Bristol.

A. and J. WARREN.

Sir,—My attention has been called to an error in the suggested form for tinct. camp. co. in my letter published in the Journal for June 30. *Ac. benz.* Zii O i should read Zii O ii. I think the mistake must have been the printer's, as O ii was certainly intended. If *vin. ferri* requires a licence for its sale, would it not be better to sell for steel wine *vin. ferri cit.*, which contains very nearly 2 per cent. ? And if a Pharmacy Act Amendment Bill ever gets into Parliament, might it not provide that no registered chemist should be required to have a licence for the sale of any P.B. preparation ?

Kettering.

J. F. THURSFIELD.

THE PHARMACY ACTS IN GLASGOW.

Sir,—As a likely means of securing fuller observance of the Pharmacy Acts, particularly in Glasgow, I made a suggestion at the recent meeting of our local Association, intended not so much for it as for the Pharmaceutical

Society. From the reports published I think it unlikely that my meaning can be fully understood. It was suggested that an experiment might well be made in Glasgow, the experiment to consist of compiling a list of all the drug shops in the city, arranging it so that the condition of each, so far as qualification was concerned, would be seen at a glance. The arrangement might be under three headings. (1) Shops in which there is no qualified person (such shops exist); (2) where there is one only; and (3) where there are two or more qualified persons. The list could be revised from time to time. There should be no secrecy about such a thing being done; indeed, therein would lie one great reason for its success. Knowledge of being marked as offenders or as likely offenders, taken in conjunction with a few prosecutions, if necessary, would have a much greater deterrent influence than prosecutions by themselves, and the same knowledge should tend to cause persons to give the necessary information regarding the conduct of their business when asked to make the list complete. It is undoubtedly a hardship when persons here and there are prosecuted and punished as "black sheep," while it is the custom of their immediate neighbours to continue committing the same offence with impunity. What person under such circumstances could without qualms of conscience give specific information regarding individual offenders ? Small wonder is it that persons on being prosecuted turn their thoughts on "who has been the informer ?" rather than on their own misdeeds, and the Pharmaceutical Society is in turn regarded as a persecutor. Full and methodical enforcement of the law appears most calculated to secure its observance and to cause the action of the Society to be viewed as dignified and just even by offenders themselves. It would also be most economical. What I have suggested might well be undertaken by the local secretaries, and no doubt local associations would support them. By all means let us have demonstrated to all both the strength and weakness of the Pharmacy Acts. My experience here is that complaint is general in the trade against both the Society and the Pharmacy Acts. Those complaining have not studied the constitution of the Society or the powers of the Act, but they form their opinions from what they see of its effect or want of effect.

J. ANDERSON RUSSELL.

212, New City Road, Glasgow.

Diary of the Week.

WEDNESDAY, JULY 18.

Society of Chemical Industry (Edinburgh Meeting).

Annual General Meeting, in the Queen Street Hall, at 11 a.m.

Reception and Conversations in the Industrial Museum, at 8 p.m.

Edinburgh Chemists', Assistants', and Apprentices' Association.

Botanical Excursion to Inverkeek, leaving Waverley Station at 8.15 p.m.

THURSDAY, JULY 19.

Society of Chemical Industry (Edinburgh Meeting).

Excursions to places of interest.

Annual Dinner at the Waterloo Hotel, at 7.30 p.m.

FRIDAY, JULY 20.

Society of Chemical Industry (Edinburgh Meeting).

Excursions to places of interest.

Smoking Concert at 9 p.m.

Quekett Microscopical Club, at 7 p.m.

Exhibition of Objects.

Books, etc., received.

THE PHARMACOPEIA OF THE HOSPITAL FOR DISEASES OF THE THROAT (Golden Square). Edited by F. G. HARVEY, F.R.C.S., Ed. Fifth Edition. Pp. 112. 2s. 6d. London : J. and A. Churchill. From the Publishers.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bennett, Cope, Ellinor, Hill, Long, Naylor, Martin, Russell, Smith.

THE PREPARATION OF SUPERFATTED SOAP.

BY C. D. MOFFAT.

In preparing neutral and superfatted soap according to the formula given by Mr. Johnson in the *Pharmaceutical Journal* of June 16, I found that on applying to the products the calomel test recommended by him there was, in both instances, a blackening of the calomel, indicative of the presence of free alkali, and showing that the proportions of alkali used were too large for producing even a neutral soap.

As Mr. Johnson mentions that he operated with the materials at his disposal, and does not state the actual strength of the caustic potash he used, it appeared probable that a difference in this respect might be the cause of the different result I had obtained.

In order to clear up this point, the saturating power of the lard I had employed was determined by heating 1 gramme of it with 20 C.c. of alcoholic solution of potash in a steam bath until saponification was complete, and then titrating the excess of alkali with standard hydrochloric acid (1 C.c. = 0.09814 Gm. KHO), after adding alcoholic solution of phenol-phthalein. The quantity of acid required to discharge the pink colour was 9.3 C.c., and that required by 20 C.c. of the potash solution was 11.3 C.c., the difference of 2 C.c. ($= 0.09814 \times 2 = 0.19628$ Gm.) representing the quantity of potassium hydrate required to saponify the lard.

This result corresponds very closely with the data given by Kötstorfer for the saturating power of lard. According to that authority the fat acid of 1000 parts of lard is saponified and neutralised by from 195.4 to 195.8 parts of potassium hydrate.*

Hence it is evident either that the quantity of alkali given in Mr. Johnson's formula was too large for producing a neutral soap, or that the caustic potash he used must have been very weak.

On testing the caustic potash I had employed, it was found to contain 81.7 per cent. of potassium hydrate. Consequently, the quantities of potassium hydrate that were used in preparing neutral and superfatted soap according to Mr. Johnson's formula and the quantities actually requisite were:—

	For neutral soap.	For superfatted soap.
Lard	100	100
Potassium hydrate used.....	22.3	20.98
" " required.	19.6	18.62
" " excess ...	2.7	2.36

This comparison shows that the quantity of alkali used was in both instances too large for producing even a neutral soap, and it accounts for the results obtained on applying the calomel test to the products, the excess of potash amounting to 13.7 and 7.0 per cent. of the quantity requisite for that purpose in the respective instances.

The reaction given by the soap prepared with the proportions of lard and caustic potash for obtaining superfatted soap, on applying the calomel test, was so very slight, although the soap contained 7 per cent. of potash in excess of neutrality, that the utility of this test appeared to be very doubtful. On applying the test to soap ascertained

by analysis to contain excess of alkali, it was found that it failed to indicate the presence of very appreciable quantities of free alkali, which were immediately detected when the alcoholic solution of the soap was tested with phenol-phthalein. I do not think, therefore, that the calomel test can be relied upon as a satisfactory means of ascertaining the neutrality of soap.

In view of the probability that superfatted soap may become an article required by pharmacists, I would suggest that the method most suitable for the preparation of a superfatted soap is to regulate the proportions of fat and potassium hydrate used according to the degree of superfatting desired in the soap. For that purpose the saturating power of the fat should be determined as above, and the amount of potassium hydrate in the caustic potash determined. In the case of lard, 19.6 may be taken as a sufficiently close approximation to the saturating power of 100 parts, and the quantity of caustic potash, of known strength, requisite for producing either a neutral soap or one containing any desired percentage of the fat in an unsaponified state, can be ascertained by a simple calculation.

Thus, for instance, in the case above stated, when the caustic potash contained 81.7 per cent. of potassium hydrate, 100 parts of lard would require 23.99 parts of the caustic potash to produce a neutral soap, and if it were desired to leave 5 per cent. of the fat unsaponified, the quantity of such caustic potash to be used would be 22.79 parts. The advantage of this method of operating would be the greater certainty obtained as to the nature of the product.

Practical Pharmacognosy.

(Continued from p. 23).

SYSTEMS OF TISSUE.

BARKS (concluded).

Cinchona Bark.

Though this bark does not display any great peculiarities in its minute structure, it has afforded work for numerous investigators, since Weddell first examined it about 1849. The cinchona barks of commerce show no trace of epidermis, this being replaced by a corky layer of the usual tabular cells. In several species the formation of secondary cork also takes place, and the presence of the rhytidoma thus formed affords a useful means of distinguishing them. It is of constant occurrence in *Cinchona calisaya*, but not so common in *C. succirubra* and others. Where it occurs to any extent, the whole of the outer tissues are displaced, and the bark, as in the case of the old flat *Calisaya*, consists exclusively of phloem tissues. The middle bark of cinchona consists, as usual, of parenchyma, in which appear more or less numerous isolated stone-cells in some cases. Laticiferous ducts, consisting of large, soft, elongated, unbranched cells (Figs. 24, p. and 25, Mi) occur where the middle and inner barks unite. When stone-cells and ducts are absent, the probable cause is the formation of rhytidoma, resulting in the displacement of the tissues containing them. The inner bark consists of primary and secondary medul-

* 'Zeitschrift für Analytische Chemie,' xviii., 199-208.

lary rays alternating with rays of phloem, the bast fibres in the latter being short, obtusely-pointed, and frequently isolated. The walls of these fibres are strongly thickened by secondary deposits, and show a distinct stratification. When softened by caustic soda, concentrated sulphuric acid, or ammoniacal oxide of copper, the walls where thickened assume a spiral appearance. When not irregularly scattered these fibres form radial rows transversely intersected by narrow strips of parenchyma, or they are closely packed

These cells have thickened walls, and the crystal cells frequently appear indented into the bast cells, as in quebracho bark. Other cells contain aggregations of minute pulverulent crystals.

The methods used in cultivation result in modification of the structure of cinchona bark to some extent, and barks from which the cortex has not been removed are now much more common than formerly.

In red cinchona bark (Fig. 24) stone-cells are

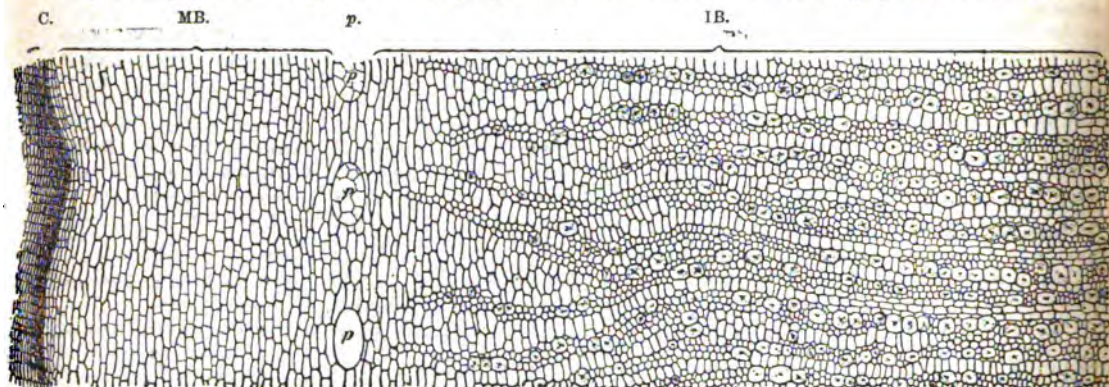


Fig. 24.—Bark of *Cinchona succirubra*. Transverse section. C, cork; MB, middle bark; IB, inner bark; p, laticiferous ducts; B, bast rays; M, medullary rays. x abt. 50. (Berg.)

in short bundles. These contain from three to seven fibres only, whereas in many other barks analogous bundles consist of a large number of fibres. To this distinction is due

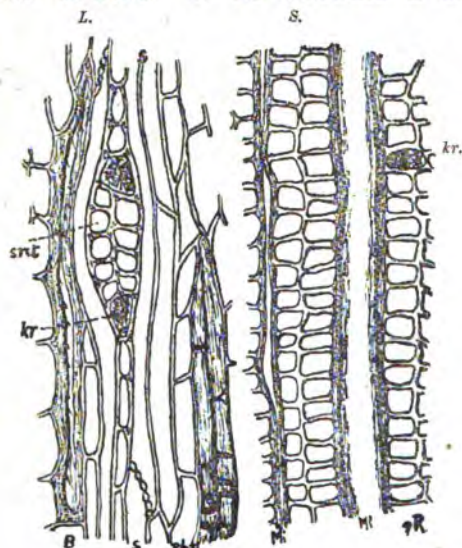
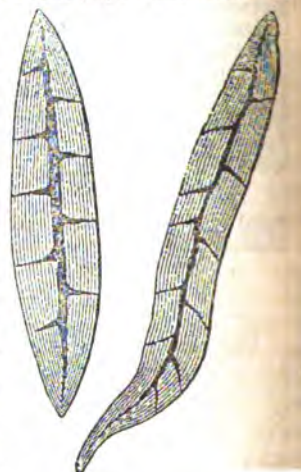


Fig. 25.—Tangential sections of bark of (L) *Cinchona ledgeriana*; (S) *C. succirubra*. Srst, medullary ray; kr, crystal cells; B, bast fibres; s, sieve tubes; php, bast parenchyma; M, laticiferous ducts. x abt. 20. (Tschirch and Oesterle.)

the difference in fracture in barks, those with long bundles having a fibrous fracture, whereas cinchonas exhibit a short one. The parenchymatous cells of the bark are loaded with small starch granules, and, in several cinchona barks, numerous cells of the medullary rays and middle bark contain resin or crystals of calcium oxalate.

absent, and the large laticiferous ducts (p) are often filled with cells, whilst the bast fibres are in interrupted lines. The tangential section through the primary bark (S, Fig. 25) shows two of the laticiferous ducts (Mi), one collapsed, and a cell (kr) in the parenchyma containing pulverulent crystals (kristallsand) of calcium oxalate. A similar section through the secondary bark of *C. ledgeriana* (L, Fig. 25) shows two such cells (kr) in the medullary ray (srst), together with two thick-walled bast cells (b), bast parenchyma (php), and sieve tubes (s) with plates. The narrow cavities and thickened walls of the short bast fibres are clearly shown in Fig. 26.

Calisaya bark much resembles the red bark in structure, the young bark containing a layer of primary cork, no stone-cells, and a number of large, laticiferous ducts near the bast rays. In the flat



bark, however, as Fig. 26.—Short bast fibres from *Cinchona* bark. already stated, bast of *Cinchona* bark. x abt. 80. (Flückiger). tissue only is found, the fibres being arranged singly or in pairs and in radial rows. Bands of secondary cork are also of frequent occurrence. A well illustrated and detailed description of the minute structure of various cinchona barks will be found in Part II. of Tschirch and Oesterle's 'Anatomischer Atlas der Pharmakognosie.'

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JULY 21, 1894.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.C.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMERIDGE, Secretary, 17, Bloomsbury Square, London, W.C.

Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STREET BROTHERS."

THE CONSTRUCTION OF THE PHARMACY ACT.

GRADUALLY and surely, but with almost painful swiftness, the purport of the Pharmacy Act is being evolved from the atmosphere of forensic sophistry in which it has recently been enveloped. Still, it is gratifying to find that some progress has been made, and that the hearing of the appeal from the decision of the Queen's Bench Divisional Court on Thursday week was a material step in advance. The publication of a verbatim report of the proceedings will relieve us from the necessity of saying much about the case in this place, beyond commending that report to the careful consideration not only of the ordinary readers of this journal, but also to everyone interested in the subject it relates to. It contains, for both, much educational and instructive matter which will tell its own tale to those willing to be informed.

But the very length of the report requires that we should put, in a few words, the main points relied upon by the appellants, and also indicate the reception they met with from the Judges of the Appeal Court before whom the counsel for the appellants desired to have "an opportunity of arguing the case without being fettered by the decisions" already given. That desire was a natural one, and it must be admitted that although the arguments put forward by Mr. BONSEY, in defence of unqualified vendors of poison, have become somewhat threadbare, they were urged by him with conspicuous ability and tenacity of purpose, which command admiration. It was again contended that "proprietary medicines" should be included under the term "patent medicines;" that the particular article to which the case related is not a preparation of morphine or of opium, but a "compound"—which is in some unexplained manner different from a "preparation," and therefore not within the meshes of the Pharmacy Act; and that in any case the proportion of poison in the article is so small that, having regard to the size of the bottle sold, the quantity of the poison in it is so "infinitesimal" that it is not a poison. Further,

it was contended that whether the foregoing propositions be tenable or not, the article containing morphine was sold in such a way that the retailers could know nothing of its contents; the precautions prescribed; by the Pharmacy Act could therefore not be applied to such a sale; and, consequently, these circumstances sufficiently justified the sale of such articles by persons ignorant of the presence of poison in them, and of the evil consequences it might produce.

There is nothing novel in these propositions, and though for a time their superficial plausibility "impressed" the judges in previous cases, they utterly failed to have a similar influence upon the Master of the Rolls and the Lords Justices sitting with him in the Court of Appeal. On the contrary, their minds were throughout directed to the question "What is the meaning of the Pharmacy Act?" and the only conclusion they could come to was that its object is to confine the sale of poisons to the hands of legally authorised persons—to prevent grocers and other unqualified persons from selling articles containing poison, whether they know that to be the fact or not. Everyone of the propositions above stated was emphatically negatived by the Master of the Rolls and the Lords Justices, and the appeal from the decision of Justices CHARLES and BRUCE (liii., p. 907) was dismissed without a shadow of reservation.

In this case the appellants had not only the advantage of the keen persistency of Mr. BONSEY, but also the assistance of a more eminent counsel in the person of Mr. FLETCHER MOULTON, Q.C., M.P. The result was a considerable prolongation of the case; but as in other applications of great guns, there was the attendant risk that the energy developed might operate in the wrong direction. The heavy ordnance of the Bar is often useful for giving effect to sophistical arguments; but when a case turns upon hard facts, a thorough acquaintance with them is indispensable, and the most charitable view to take of Mr. MOULTON's part in this case is that he was wanting in that essential equipment.

As regards the construction and future administration of the Pharmacy Act, a very great advance has been made by the hearing of this appeal. As evidence of that it may be mentioned that the Grocer, which has hitherto generally maintained a discreet silence on the subject, now endeavours to show that the judges were impressed with Mr. MOULTON's assertion that "the endeavour to secure a monopoly" was the main object of the Pharmaceutical Society. Our readers will be able to judge from the report how far there is any ground for that statement (see report, pages 54 and 55.) Our contemporary also clings to the belief that the question—What is a poison?—must be determined by the quantity of the thing to which the term poison is applicable. There may be some temporary com-

fort in that belief; but, in our opinion, it is the only foundation for the *Grocer's* plaintive expression of regret that "the present doubtful state of the law is most unsatisfactory and perplexing."

At the same time, the fact remains that, though recent interpretations of the Act render its actual bearing much clearer, difficulties arise from time to time with regard to its administration. The latest instance of this occurred in a case heard at St. Helens on Wednesday, of which a brief interim report is given at page 67. A detailed report will be published in next week's Journal, and it will then be seen how the conflicting nature of the evidence resulted in the adverse decision of the judge.

SOCIETY OF CHEMICAL INDUSTRY.

THE proceedings of the annual meeting of this Society commenced on Wednesday, in Edinburgh, with a general session in the Queen Street Hall. There was a large gathering of members, and the President was supported on the platform by Baillie DUNLOP, Dr. JOHN MURRAY, Professor CRUM BROWN, Dr. STEVENSON MACADAM, and others. In the absence of the Lord Provost, who is now at Windsor to receive the honour of knighthood, Baillie DUNLOP welcomed the Society to Edinburgh.

After the opening ceremonies of welcome by the civic authorities and their acknowledgment by the President, the report of the Council was read, showing a steady increase in the number of members, notwithstanding some fluctuation by reason of deaths. At the last annual meeting the Society had 2784 members; it has now 2828. There has been a considerable increase in the number of papers contributed to the Society's Journal, indicative of greater activity. The excess of income over expenditure has, however, been rather less than in the previous year, although the financial position is generally satisfactory.

Among other matters referred to in the report, the desirability of amendment in the law relating to patents was mentioned as having engaged the attention of a committee, with the result that it has been decided to take action in this matter at the earliest moment that the general course of public business will permit, with a view to obtaining a Royal Commission to consider the whole subject. The proposed alterations of the Society's bye-laws, which the Council has decided to submit for acceptance, were described, and the advantages likely to result from them pointed out. Another circumstance of great interest in connection with the work of last year is the establishment of a section of the Society in New York. This is a very important advance, and it is to be regarded as the first step towards an international organisation for promoting improvements in the industrial arts by applications of chemical science, which may lead to great results.

The President in his address made special reference to the utility of the Society in promoting scientific knowledge and its application to industrial arts, pointing out the signal deficiencies of our own country in that respect as compared with others. He especially insisted upon the desirability of research as being a national necessity in this respect, but it is a striking illustration of the benighted state of mind from which we are only beginning to emerge that he should have asso-

ciated the word research with the emasculating adjective "original." But that mistake was largely compensated for by the remarks showing the practical gain to the nation and to industry generally, resulting from investigations such as those of WELDON and PERKIN, the one having contributed to the cheapening of every yard of calico and every quire of paper, while the other originated an industry which has revolutionised the arts of dyeing and calico printing. Such services are too little appreciated by British manufacturers, and the means by which they are to be facilitated for their own and the national benefit are still almost ignored. In connection with this subject, the insufficiency of our educational system and of the existing law of patents was mentioned as urgently requiring amendment. The vast field of inquiry opened up by the discovery that—in some of the most important manufacturing industries, and even in familiar domestic operations—minute organisms, whose existence was unsuspected a few years ago, are really the effective factors which determine results, was adduced as a case in point. On that basis, and from the point of view of other recent discoveries, a prophetic sketch of the possible future of industrial arts was briefly sketched upon the lines suggested by BERTHELOT, and the very interesting address was concluded by a description of seaweed products not altogether in harmony with its general tenour.

The conversazione in the evening at the Museum of Science and Art, which was carried out with great success, was very largely attended, affording agreeable opportunity for social intercourse and the formation of acquaintances. In other respects, also, the Edinburgh meeting promises to be one of the most useful, interesting, and successful among the annual gatherings of the Society of Chemical Industry.

URINE TESTING.

IN the reprinting of Sir GEORGE JOHNSON'S paper on the testing of urine in last week's Journal the possibility of mistaking the abbreviations for the gramme and the grain was unfortunately illustrated; the compositor having, with perverse ingenuity, put "gramme" for "gr." throughout the paper. To remedy this mistake two pages of the Journal (25 and 26) have been reprinted for the purpose of being substituted for those in which the errors occur, and are issued with the present number.

JOULE STUDENTSHIP.

MR. J. D. CHORLTON, B.Sc., of Owen's College, Manchester, has been elected to the first Joule Studentship by the President and Council of the Royal Society, upon the recommendation of the Committee entrusted with the duty of making the award.

AMERICAN PHARMACY FAIR.

ACCORDING to the *New England Druggist* it is intended to hold a "medical and general pharmacy exhibition of the most comprehensive character in Mechanics' Hall, Boston," early next year. It will be known as "The American Pharmacy Fair," and is intended "to include—on a large scale—absolutely every article and product in the daily trade of an up-to-date retail druggist."

Transactions of the Pharmaceutical Society of Great Britain.

EXAMINATIONS IN LONDON.

July, 1894.

Present:—Mr. Carteighe, President; Mr. Cross, Vice-President; and all the members of the Board.

MAJOR EXAMINATION.

Forty-seven candidates were examined. *Twenty-one* failed. The undermentioned *twenty-six* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Anthony, Everard Percival	Bedford.
Ashby, Charles Edmund	Weston-super-Mare.
Athey, George Hedley	Morpeth.
Butler, Ernest Charles	Stamford Hill.
Cowin, William Stephen	Union Mills.
Cox, Harry Bertrand	Shepton Mallet.
Davies, Robert Fisher	Pontardawe.
Dyson, Herbert	Derby.
Foden, Thomas Henry	Birmingham.
Gamble, Frederic William	King's Lynn.
Gillitt, Albert Ambrose	London.
Greig, John	Montrose.
Harvey, Thos. Featherstone	Sibley.
Hayward, Walter Edwin	Pudsey.
Henry, Thomas Anderson	Barrow-in-Furness.
Hill, Aubrey Thomas	Boston.
Jackson, Thomas	Preston.
Lander, Arthur	St. Keyne.
Martin, George Hymers	Gateshead.
Maskew, William	Easingwold.
Mercer, Frank Norland	Farnworth.
Roberts, George Daniel	Spalding.
St. Cyr, Etienne Laurent Nelvil	London.
Southall, Horace	Birmingham.
Ward, Joseph William	Gloucester.
Williams, William	Carnarvon.

EXAMINATIONS IN EDINBURGH.

MAJOR EXAMINATION.

Three candidates were examined. *One* failed. The following *two* passed, and were declared qualified to be registered as Pharmaceutical Chemists:—

Highfield, Henry	Sheffield.
Turner, John William James	Sheffield.

Provincial Transactions.

THREE TOWNS AND DISTRICT CHEMISTS' ASSOCIATION.

The quarterly meeting of this Association was held at the Foresters' Hall, Plymouth, on Wednesday, July 11, at 3 p.m., Mr. J. G. Netting, President, in the chair. Four new members were elected and one honorary member (Mr. E. M. Holmes). A unanimous vote of thanks was passed to the Pharmaceutical Society for their liberal gift of a *materia medica* cabinet. A resolution was passed supporting the draft Pharmacy Acts Amendment Bill, and it was decided to have a dinner in October. The following paper was then read:—

PHARMACY AS PRACTISED IN FRANCE.

BY O. J. PARK, M.P.S.

There are two grades of pharmacists recognised in France as in England. The pharmacien of the 1st class can purchase or open a pharmacy in any part of France, whilst the pharmacien of the 2nd class is restricted to a certain degree in this respect.

Elèves, or assistants, are required to have passed certain standards at the lycées, or schools, before they could be registered as "élèves en pharmacie" and commence their studies at one of the schools of pharmacy.

All these schools, situated in different parts of France and generally associated with schools of medicine, with the exception of one at Lille, are under the control of the State, which appoints the professors, fixes the fees, etc. Some only of these schools have the power of granting diplomas of the first class. Students have to be twenty-five years of age before presenting themselves for examination, and are required to have been six years engaged in pharmacy, and to have followed the course at one of the schools for three years. The subjects taught at the schools are natural history, botany, physics, theoretical and practical chemistry, and toxicology.

French chemists are only allowed to have one shop each, and are not allowed to work in conjunction with unqualified persons. It is illegal for a medical man in conjunction with a pharmacien to give gratuitous advice and reap a benefit from the prescriptions.

Pharmaciens have the sole right of compounding and retailing medicines for human beings, either for internal or external use. Medical men situated in rural districts where there is no chemist are allowed to dispense medicines, but if they visit a patient who lives near an established chemist, they are not entitled to send medicines. Hospitals and religious communities can compound medicines for their inmates.

Secret medicines are strictly illegal, and the formulae of all specialties have to be submitted to a board appointed by the State and approved of before being allowed to be placed before the public.

French pharmacies open generally at 7 a.m., and close at 10 p.m. all the year round, Sundays included, and someone is supposed to be present at all hours for cases of necessity. Their sales are confined strictly to drugs, chemicals, and mineral waters, and it would be considered unprofessional to handle the variety of toilet articles, etc., which is often an important part of the business of their English confrères.

The social status of the French pharmacien is higher than in England, and if serving in the Army, he ranks as a commissioned officer the same as a surgeon.

The chief poisonous drugs and chemicals are required by law to be kept in a locked cupboard in the pharmacy, and the pharmacies are visited at least once a year by officers appointed, who examine scales, poison cupboard, register of poisons sold, prescription-book, and stock; they can confiscate anything faulty if found, and the owner is fined in that case.

The Codex, or pharmacopœia, is hardly up to the level of modern pharmacy, and contains many substances which might very well be eliminated. The compilers of this work, like those of our own pharmacopœia, are evidently very conservative.

Prescriptions are written in the mother tongue, and the weights and measures used are according to the metric system. All substances are weighed; not an unmixed advantage, considering the different specific gravities of the substances employed.

Wines and syrups are largely used as vehicles in dispensing; cachets are largely used; suppositories are generally about thirty grains, of a conical shape, resembling an ordinary wooden vent plug. Dose-metric granules, resembling homœopathic pills, are largely prescribed; these are generally used when prescribing patent medicines such as strychnine, digitalin, arsenic, etc. Small gelatin capsules, termed "perles," containing ether, chloroform, turpentine, creasote, apiol, etc., are in frequent use. Liniments are largely prescribed, and alcohol being low in price they can be used freely without entailing a large expense to the patient. "Bains," or preparations for medical baths, are in general demand; also ointments known technically as "pommades."

After the usual vote of thanks, the meeting terminated.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

APPEAL BY DEFENDANT IN THE CASE OF THE PHARMACEUTICAL SOCIETY v. ARMSON.

Powell's Balsam of Aniseed.

This case came on for argument at the Court of Appeal on Thursday, July 12, before the Master of the Rolls, Lord Justice Kay, and Lord Justice A. L. Smith, Mr. Fletcher Moulton, Q.C., M.P., and Mr. Bonsey appearing for the appellant; Mr. Crump, Q.C., and Mr. T. R. Grey for the respondents.

When the appeal was called on, Mr. Bonsey said he appeared with Mr. Moulton, who was at that moment cross-examining a witness in another court, and he asked that the case might be deferred for a short time, but the Master of the Rolls said he had better proceed.

Mr. Bonsey: This is an appeal, my Lords, from the Divisional Court affirming the judgment of the County Court in an action brought to recover a penalty under the Pharmacy Act, 1868.

Lord Justice Kay: Has there been leave to appeal?

Mr. Bonsey: Yes, my Lord. The action is brought by the Pharmaceutical Society against the appellant, Armson, for selling a poison, he not being a qualified chemist and druggist, and the question really is whether a proprietary medicine known as Powell's balsam of aniseed is a poison within the meaning of the Pharmacy Act, and therefore can only be sold by properly qualified chemists and druggists.

Lord Justice Smith: What is it used for, Mr. Bonsey?

Mr. Bonsey: It is for coughs and colds, my Lord, a remedy often prescribed.

Lord Justice Smith: Is it taken internally or rubbed on externally?

Mr. Bonsey: It is taken internally, my Lord. The Pharmacy Act is the 31 and 32 Vict. cap. 121.

The Master of the Rolls: What section, please.

Mr. Bonsey: The action is brought under section 15. "From and after the 31st December, 1868, any person who shall sell or keep an open shop for the retailing, dispensing, or compounding poisons . . . not being a duly authorised pharmaceutical chemist . . . shall for every such offence be liable to pay a penalty or sum of £5, and the same may be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act," that is the former Act, under which the penalties are recovered by action in the County Court.

The Master of the Rolls: This was an appeal from the County Court.

Mr. Bonsey: Yes, my Lord.

The Master of the Rolls: The County Court judge held it was a poison. That is a fact, is it not. How do you get over that?

Mr. Bonsey: I submit it is not really a question of fact.

The Master of the Rolls: Is it not? I only ask you. You know, it strikes me you have a difficulty there to start with.

Mr. Bonsey: The difficulty is to define really what is a poison under the Act.

Lord Justice Kay: That is a fact surely; whether it is a poison or not is a fact.

Mr. Bonsey: I submit that is really a question of law, and not of fact.

The Master of the Rolls: A question of law! Lawyers know a great deal, but I do not know that they know whether a thing is a poison or not unless they take it, and if they did there would be an end of them.

Lord Justice Kay: I suppose there was medical evidence on this subject?

Mr. Bonsey: Yes, my Lord.

Lord Justice Kay: On that evidence the judge had to decide.

Mr. Bonsey: It arose in this way, my Lord. By the Act there are certain articles specified in a schedule to the Act which are to be deemed poisons within the meaning of the Act. Then the question is whether, if a very small quantity of one of those articles be sold—

The Master of the Rolls: Have you got the facts found by the County Court judge?

Mr. Bonsey: I have the judgment of the County Court judge.

The Master of the Rolls: We ought to have it.

Mr. Bonsey: The question is whether the Act applies.

Lord Justice Smith: You said something about schedule A. In what section is schedule A referred to in the Act?

Mr. Bonsey: In section 17.

Mr. Crump: And section 2: "The several articles named or described in schedule A shall be deemed to be poisons within the meaning of the Act."

The Master of the Rolls: Where is that?

Mr. Bonsey: That is section 2, my Lord.

The Master of the Rolls: The Pharmaceutical Society has power to add to that schedule, its additions being sanctioned by order of the Privy Council. It does add to it from time to time. That schedule consists of two parts, and the poisons in the first part and in the second part are dealt with differently in the Act with regard to the restrictions upon their sale. Poisons in the first part of the schedule can only be sold (even by a chemist) to a person whom he knows, or to some person who is introduced by a person whom he knows, and he has to enter the particulars in a book.

Lord Justice Smith: What section is that?

Mr. Bonsey: Section 17. Then with regard to those in part 2 they have to be labelled "poison."

The Master of the Rolls: Has this been dealt with? You call it by some name, but the judge calls it morphine.

Mr. Bonsey: In this ounce bottle of Powell's balsam of aniseed, which consists of six or eight different drugs, there is one-tenth of a grain of morphine.

The Master of the Rolls: I only wanted to ask you whether the Society has said that morphine is a poison, and whether the Privy Council has adopted that.

Mr. Bonsey: It is one of the poisons scheduled in part 2.

Lord Justice Kay: Opium and all preparations of opium or poppies are scheduled in part 2.

Mr. Bonsey: Yes.

Lord Justice Kay: Now tell me how part 2 is to be sold. Which section is it?

Mr. Bonsey: Section 17 deals with it, my Lord—the restrictions.

Lord Justice Kay: "It shall be unlawful to sell any poison unless the box, etc., is labelled," and so on.

Mr. Bonsey: Then with regard to articles in part 1, they are only to be sold to a person known to the chemist or introduced to him. If the article is in the second part of the schedule, then it is labelled "poison."

Lord Justice Smith: Whereabouts is that?

Mr. Bonsey: At the beginning of the section it says: "It shall be unlawful to sell any poison, either by wholesale or retail, unless the box, bottle, vessel, wrapper, or cover in which such poison is contained be distinctly labelled with the name of the article and the word 'poison,' and with the name and

address of the seller of the poison." Then it goes on to say that it shall be unlawful to sell any poison in the first part of the schedule to any person unknown to the seller.

Lord Justice Kay: First of all, none of these things in schedule A can be sold except by a proper chemist.

Mr. Bonsey: No, my Lord; they cannot be sold except by a chemist.

The Master of the Rolls: This man was a grocer.

Mr. Bonsey: That is to say, they cannot be sold in their simple state.

Lord Justice Kay: The simple state. This says, "Opium and all preparations of opium."

Mr. Bonsey: What I mean is this. If I were to go into a shop and ask for morphine or opium, I can only get that from a chemist.

Lord Justice Kay: Did not the County Court judge find that this was a preparation of opium?

Mr. Bonsey: No; not that Powell's balsam of aniseed is a preparation of opium—it is a compound.

Lord Justice Kay: "The bottle was found to contain among other ingredients one-tenth of a grain of morphine, which is the chief medicinal principle of opium, and is in its pure state a dangerous poison. It was not disputed that morphine was a poison within the meaning of the Act."

Mr. Bonsey: All that the County Court judge has found is, and of course it was not disputed, that one of the ingredients of this Powell's balsam of aniseed—that is, to the extent of one-tenth of a grain—was morphine, one of the poisons scheduled in the Act. Then the only evidence with regard to the effect of that is this—

The Master of the Rolls: Suppose a grocer put more than one-tenth of a grain by mistake, where would he be?

Mr. Bonsey: The grocer does not dispense it, my Lord. He merely sells it by retail.

The Master of the Rolls: Who makes it?

Mr. Bonsey: The manufacturers—Messrs. Powell.

The Master of the Rolls: The grocer sells it. But suppose the manufacturer or his man makes a blunder?

Mr. Bonsey: Well, my Lord, the grocer does not know anything about it.

The Master of the Rolls: Then the question is whether he ought to sell it if he does not know.

Mr. Bonsey: No one knows. All these proprietary medicines, your Lordship knows (what are called stamped medicines, on which a government duty is levied), are simply preparations. They are called specific remedies, and neither the chemist nor the grocer knows as a matter of fact what they do contain; therefore the chemist would be liable to a penalty under the Act if he sold one of these proprietary medicines without entering in a book the contents, that is, the ingredients, if it happened to contain a poison in part 1 of the schedule. It so happens in this particular case that it is in part 2.

Lord Justice Kay: I see what the learned judge has decided. He says, "If the whole of this bottle were taken by an infant it would kill him."

Mr. Bonsey: If the whole thing were taken at once.

Lord Justice Kay: Therefore, it is a poison. That was decided, in the case which he referred to recently, that if the whole of the contents of the bottle were a poison then it comes within the Act.

Mr. Bonsey: That is the difficulty. Does it depend on the size of the bottle?

Lord Justice Kay: It is one of the preparations mentioned in the schedule.

Mr. Bonsey: Does it depend upon the size of the bottle in which this medicine happened to be sold whether it is a poison? The judge has found that the

only evidence was that if a child happened to take the whole bottle at once it might be injurious, and that if an infant took it all at once it would probably be fatal. That was the strongest way in which it could be put by the witness, Dr. Luff, who was called for the plaintiffs. The evidence before the County Court judge with regard to that was simply that of Dr. Luff. He said if the whole bottle were taken at once by a child in ordinary health it would certainly be injurious, and might be fatal, and to an infant it very probably would be fatal; that is to say, assuming the child took the whole bottle at once. Will the question as to whether a thing is a poison or not depend merely upon the size of the bottle in which it is sold?

Lord Justice Kay: The first question is whether it is a preparation of opium? If it is a preparation of opium you are distinctly violating the Act of Parliament in selling it. Then, if it is necessary to go further, the second question is whether, as sold by you, it is possibly deleterious?

Mr. Bonsey: The question, my Lord, has been considered—the same point—in two cases in the Divisional Court.

The Master of the Rolls: Are not we bound thus far—I do not know what your law is, but by the facts? He says: "It was stated in the evidence given on behalf of the plaintiff, that if the whole of the contents of the bottle were taken at once by a child in ordinary health, it would certainly be injurious, and might be fatal, and to an infant very probably fatal." This evidence was not contradicted or seriously impugned. He found that as a fact. I do not say what your law is, but he finds that as a fact, and we must take that to be the truth.

Mr. Bonsey: Yes, my Lord. I say that would apply to innumerable things which are perfectly harmless and beneficial.

Lord Justice Kay: But then they would not be opium or preparations of opium. You are dealing with one of the things prohibited in the schedule. Take this case for example. Suppose it was a preparation of opium, the quantity of which would not harm a child if he drank the whole it, but this thing stands prohibited by this schedule. Was it not decided in the case to which the learned judge referred that mixing it with other ingredients does not make it any the less a preparation of opium?

Mr. Bonsey: The case to which the learned judge refers, which is the Pharmaceutical Society v. Piper—

Lord Justice Kay: That was chlorodyne.

Mr. Bonsey: Yes, my Lord. It was argued there that the Act does not apply where only one of the ingredients in the compound is one of the scheduled poisons in the Act.

The Master of the Rolls: Where is that case?

Mr. Bonsey: The Law Reports for 1893, 1 Q. B. D., page 686. What was decided there was that it does apply even if it is only one of the ingredients of a compound, and the judges held that the thing in its entirety, that is to say, if the whole bottle had been taken at once, was a poison; although, so far, the learned judges expressed themselves, I think, that they had great doubt whether that was the proper interpretation of the Act. In that case, my Lord, it was chlorodyne, and there was a very much larger quantity of morphine there. Then Mr. Justice Collins says in his judgment, "I am not by any means sure that I have arrived at the right conclusion in the matter I think in this particular case the article in question, viz., chlorodyne, does come within the designation 'poison' within the meaning of the Act in question It is also found that in the bottle sold there was sufficient morphine to kill an adult if the whole contents of the bottle were taken at once. Therefore, I

the particular case before us, I think we may take it that the thing sold was, in its entirety, a poisonous thing, that is to say, that a small quantity of it would kill . . . I am also of opinion . . . that it is a compound into which poison enters as one of the ingredients, and that, on that ground, it is within the purview of the Act, and comes under the designation 'poison,' and is dealt with by the Act. But while I am of that opinion with respect to this particular matter . . . viz., chlorodyne, I do not think it is necessary to lay down any rule which would cover every possible case where some infinitesimally small amount of poison enters into a larger compound." Then there was also another question raised in the case, whether it was a patent medicine, and therefore exempted.

Lord Justice Kay: I understand you to say your bottle is labelled so as to show it is intended to be used by infants.

Mr. Bonsey: Yes, there are certain prescribed doses.

Lord Justice Kay: It is intended to be used by infants, and if the whole were given to an infant, that infant might be poisoned.

Mr. Bonsey: I think the smallest dose prescribed on the bottle is for a child of four years of age.

The Master of the Rolls: I see you argued that case?

Mr. Bonsey: Yes, my Lord.

The Master of the Rolls: What is the difference between that case and this? Is there any?

Mr. Bonsey: There is another case to which I am going to refer.

The Master of the Rolls: You have a right to say this case is wrong, of course.

Mr. Bonsey: Certainly, my Lord.

The Master of the Rolls: I ask you whether this appeal does not involve the question whether that case is right or wrong?

Mr. Bonsey: It does, my Lord, but the court gave us leave to appeal in this case.

The Master of the Rolls: For the purpose of considering Piper's case?

Mr. Bonsey: Yes, my Lord. They said they were bound by Piper's case.

The Master of the Rolls: That is quite true.

Mr. Bonsey: I submit that Piper's case is really wrong on that point.

The Master of the Rolls: I understand. That is quite legitimate. You have a right to raise that point here.

Lord Justice Kay: Is not the mischief, which this Act was intended to prevent, the dealing by people who are not chemists with medicines to be taken internally, which either are preparations of opium or contain preparations of opium sufficient, if the whole be taken, to kill?

The Master of the Rolls: I only want to get the question we have to decide, that is all. I do not think we need trouble in this case whether the article sold, that is, the preparation or compound, or whatever you call it, had so little poison in it that it could not kill any human being, or injure them. We have not got to decide that, because here you have a finding that it will injure a child and perhaps kill, and if it were an infant it would probably kill him.

Mr. Bonsey: Yes, my Lord. Then, my Lord, that is a wide definition of the word "poison," because if it depends merely on the quantity taken—

The Master of the Rolls: I was only saying (I do not decide against you at present), that I do not think it is necessary to decide whether, if the compound was one which could not hurt any human being at all, it would be within the Act.

Mr. Bonsey: Then, my Lord, if this judgment in Piper's case is right, and that, under the Act, it be sufficient to show that one of the ingredients of a

medicine is one of the scheduled poisons, then it is no matter what the quantity is.

The Master of the Rolls: If you like to argue that point, I do not mind deciding it.

Mr. Bonsey: If that is sufficient, it does not matter at all whether taking the whole bottle is poisonous or not.

The Master of the Rolls: It may be that the thing will hurt nobody, but that depends on who makes the compound; and the person who makes the compound really ought to be a skilled person, who knows how much poison will injure or kill a man or a child. That is what the Act means. Then if the Act means that, it goes further, in order to save the public, and says: If you choose to sell a thing without knowing what is in it, or knowing what is in it—it does not signify—in selling it you run the risk of its containing any poison, and if it contains any of the named poisons you are liable to the penalty.

Mr. Bonsey: If that was the intention of the Act it would have been extremely easy to say, in so many words, that it applies to a compound of which one of the ingredients is a poison within the schedule; and it does not say that, anywhere.

The Master of the Rolls: It need not say so. If it says: If you sell an article in which there is any, they need not say a compound.

Mr. Bonsey: It does not say that: All the Act says is that you shall not sell poison.

The Master of the Rolls: Your argument, it seems to me, must go this far. You might sell pure opium if you sold it under another name, if you called it—I do not know what you might call it—if you called it "goody."

Mr. Bonsey: It would be opium still; but if you have a chemical compound, say, of six or eight different drugs, and there happens to be, as there is in almost every medicine, a very small quantity of a poisonous drug, that is to say a drug which taken in a large quantity would kill, is that compound or medicine a poison within the meaning of the Act?—that is to say, one of the scheduled poisons under the Pharmacy Act?

The Master of the Rolls: You say the penalty depend upon how much poison there is in it, and on a jury finding whether that quantity of poison would hurt anybody.

Mr. Bonsey: My first point is that the Act does not apply to a compound of which one of the ingredients is a poison scheduled in the Act.

The Master of the Rolls: Then you know, if there are two things in the compound, and half of it is one of those poisons, your argument says, very well, they may sell it.

Mr. Bonsey: Because it is quite possible to have a combination of two substances producing a different one altogether.

The Master of the Rolls: It is, and it is quite possible the compound might kill anybody who took it.

Mr. Bonsey: Or it might not. You may have a chemical combination.

The Master of the Rolls: Supposing it was proved to the satisfaction of the court—I am only trying to test your argument—that whoever took a compound consisting of two things must be poisoned, you say there would be no penalty, because he did not sell the deleterious thing—the poisonous thing—by itself.

Mr. Bonsey: I do say so, my Lord. It may be that it would be wise to have legislation to cover that; but I say this Act does not cover that, and it was not intended by this Act. It may be an omission on the part of the Legislature.

Lord Justice Kay: See how far that goes. They are not to sell any preparation of opium unless they are qualified persons. Suppose opium and water or opium and any other thing you like were mixed in a

certain proportion, would not that be a preparation of opium?

Mr. Bonsey: It might be if it were merely diluted with water.

Lord Justice Kay: Then the addition of something does not prevent it being a preparation of opium, nor does it cease to be a preparation of opium by the addition of other things?

Mr. Bonsey: That is one point in the case, my Lord. I submit there is a distinction between a preparation of a drug—what is commonly called a preparation of opium—and a chemical compound of which one of the ingredients happens to be a preparation of opium. That is what I mean.

Lord Justice Kay: Still, if you sell the compound you sell the preparation of opium, which is an ingredient of it?

Mr. Bonsey: But it does not make the compound a preparation of opium.

Lord Justice Kay: Still, if it contains a preparation of opium you sell the preparation of opium.

Mr. Bonsey: If you only sell it in a combination of which it forms a part.

Lord Justice Kay: Take pure morphine, and mix it with sugar; you say they may sell that?

Mr. Bonsey: I should doubt whether they could.

The Master of the Rolls: Is not that a preparation of opium?

Mr. Bonsey: I am not quite chemist enough to answer that question.

Lord Justice Kay: It does not want a chemist to answer it.

Mr. Bonsey: I submit it does. It may be that sugar would not alter the effects of the opium at all.

The Master of the Rolls: When we were children the nurse used to give us grey powder, or some other nastiness with strawberry jam; you say they did not give us grey powder because they gave a compound of grey powder with strawberry jam.

Mr. Bonsey: I submit that compound and preparation are not the same.

The Master of the Rolls: Is the word compound used in the Act?

Mr. Bonsey: Yes, my Lord, in the schedule] compound."

The Master of the Rolls: Which schedule?

Mr. Bonsey: One of the additions that were added by the Privy Council in 1869.

The Master of the Rolls: It is not in this Act then?

Mr. Bonsey: It is here, my Lord, on the left-hand page. [Handing copy of the poison schedule.] "Every compound containing any poison within the meaning of the Pharmacy Act, 1868, when prepared or sold for the destruction of vermin." Why should they there use the word "compound," if compound and preparation mean the same thing? All through, the schedule itself speaks of these different poisons and their preparations, which I submit is a chemical term.

The Master of the Rolls: I do not think this schedule does you much harm. It is "every compound containing any poison within the meaning of the Pharmacy Act, 1868, when prepared or sold for the destruction of vermin."

Mr. Bonsey: Yes, my Lord.

The Master of the Rolls: I hope you do not consider children vermin?

Mr. Bonsey: No, my Lord, what I mean is this. If preparation and compound mean the same thing—

The Master of the Rolls: I am saying that in your favour.

Mr. Bonsey: I claim that this is in my favour. I crave this in aid of my argument.

The Master of the Rolls: In saying that in your favour, I mean that addition is not against you in this case.

Mr. Bonsey: No, my Lord, I was going to point to it in aid of my argument.

Lord Justice Kay: You are using it because the word "compound" is used there. You want to construe the schedule of the Act as not including compounds because it is especially put in there.

Mr. Bonsey: Yes, my Lord, with great respect, I think I may say that in the court below, in Piper's case and in Delves's case, it was accepted also by the court that "compound" and "preparation" are not the same thing.

Lord Justice Kay: I do not believe there is any preparation which is not a compound.

Mr. Bonsey: It was never suggested that they were the same.

The Master of the Rolls: I do not say they are. I should say a compound was a preparation, but a preparation need not be a compound, if you ask me.

Mr. Bonsey: That may be so, my Lord; but when you talk of a preparation of a thing I submit that it means that the substance itself remains practically the same. Surely it could not be said that anything into which opium entered as an ingredient is a preparation of opium; surely that would be wrong as a chemical term—anything into which it might happen to enter.

Lord Justice Kay: If you are right, the Act would be liable to evasion in the simplest way, for you would have nothing to do but put another ingredient with the opium, and then you could say it was not a preparation of opium, and it could be sold. Surely the Act cannot mean that.

Mr. Bonsey: I think, with great respect, the Act was simply intended to prevent the sale of poisons as poisons, as defined in the schedule to the Act. If it had not been so, if it had been intended to prohibit the sale of all medicines in which one of the ingredients happened to be poison, it would have been extremely easy to say so.

The Master of the Rolls: The people against you will say they have said so. You mean that they could have said so in words. What words?

Mr. Bonsey: Take, for instance, section 17.

Lord Justice Kay: You are in this difficulty—if you sell a compound, you sell everything which is included in the compound. If the compound includes opium, you sell opium.

Mr. Bonsey: You may sell it, or you may not sell it at all. If I may follow that out for a moment, as your Lordship knows, you may have a chemical combination of two substances, and the thing you produce is neither of those.

Lord Justice Kay: A chemical combination? You do not pretend that this is a chemical combination which alters the opium into something which is not opium.

Mr. Bonsey: But you might have.

Lord Justice Kay: I do not think you might.

The Master of the Rolls: What do you say to strychnine. Must it be simply strychnine?

Mr. Bonsey: I do not know whether that is in the schedule.

The Master of the Rolls: Yes, that is one. Medical men in our time give you something or other with strychnine in it as a tonic.

Mr. Bonsey: Yes, my Lord, it is a common tonic.

The Master of the Rolls: Do you say a grocer may go and make a compound of strychnine and sell it?

Mr. Bonsey: He cannot dispense it. A grocer cannot make up and prescribe. That is an entirely different thing.

The Master of the Rolls: Is it so? Would it make any difference if that grocer had made up this thing himself, and then sold it?

Mr. Bonsey: Yes, my Lord, because I submit that

one of the real objects of the Act was to deal with the question of dispensing.

Lord Justice Kay: It says retailing, dispensing, or compounding. "It shall be unlawful for any person to sell or keep open shop for the retailing, dispensing, or compounding of poisons."

The Master of the Rolls: That means selling. They all end in selling.

Lord Justice Smith: If this Act only applied to poisons *per se*, uncompound poisons, why do they except in section 17 the case of medical practitioners compounding medicines so as not to be within the Act? They may compound poisons and not be within the Act.

Mr. Bonsey: I am glad your Lordship refers to that. What I was going to say in a moment was this. Except for that provision in section 17, I say it would be clear that the Act did not apply to compounds, although one of the ingredients was a poison. It is only on that provision in section 17 that they can base their contention.

Lord Justice Kay: It says: "It shall be unlawful for any person to sell or keep open shop for the retailing, dispensing, or compounding of poisons."

Mr. Bonsey: Yes, my Lord.

Lord Justice Kay: That must mean you cannot sell compounded poisons?

Mr. Bonsey: If I may try to make myself clear in answer to what the Lord Justice put to me, except for that provision in section 17, the Act would be perfectly clear. I submit that it only applies to the sale of poisons in what I may call their simple state: but it is by authority of that provision of section 17 that they say, therefore, you must infer that it does apply to a compound of which one of the ingredients is a poison. That is the argument on which they base their case.

Lord Justice Smith: Because they would not have made the exception.

Mr. Bonsey: Inferentially I say if that had been the object in the first part of section 17, it would have said: It shall be unlawful to sell any poison or any compound of which one of the ingredients is a poison either by wholesale or retail. They want to read it in that way.

Lord Justice Smith: Suppose there was such a very small amount of poison that it would kill nobody, you would not say that was a poison, would you? But suppose so much was put in as to make the whole bottle poisonous, is it not within the Act then?

Mr. Bonsey: That arose in the case of the Pharmaceutical Society v. Delve, which is after Piper's case, in January of this year. There it was the sale of what is called "licoridine." That was a preparation of morphine. It was analysed, and the analyst said he found morphine, but did not estimate the actual quantity. He further said it was not a trace; it was more than a trace, but he was not instructed to take the quantity. It might be that the quantity was one-fiftieth of a grain per ounce, or three-fiftieths of a grain in the bottle: "I am not prepared to say whether taking the whole of the contents of the bottle would do an adult any harm." The Divisional Court there, Mr. Justice Charles and Mr. Justice Wright, held that that was not a poison within the Act.

Lord Justice Smith: There was nothing to do harm.

Lord Justice Kay: Was it one of the articles in Schedule A?

Mr. Bonsey: Yes, my Lord, morphine. The same thing as here. That is making it depend really on the quantity. Merely whether the person or child taking the whole bottle at once would be injured. That is the only way you can reconcile those two decisions.

Lord Justice Kay: What puzzles me is that there is

no provision in the Act as to the quantity of these articles in Schedule A.

Mr. Bonsey: No, my Lord, nothing about quantity. Lord Justice Kay: You cannot deal with it at all, it does not matter what the quantity is.

Mr. Bonsey: But what I am trying to express is this, that as these two decisions stand, Piper's case and Delve's case, the court seems to have said that it merely depends on the quantity which happens to be in the compound sold at the particular time. A person might go and buy two or three bottles at once: but because he goes and buys a small bottle which only contains an infinitesimal portion, then that is not a poison; but if he goes and buys a large bottle it is.

The Master of the Rolls: If it is infinitesimal you may say it is not there at all.

Mr. Bonsey: But where, as in this case, the analyst says: "I found morphine; it was not a mere trace, it was more, but I did not actually estimate the quantity."

The Master of the Rolls: But the judgment is that it was infinitesimal.

Mr. Bonsey: Perhaps I put it too high in putting it in this way, but it is the question if it is a substantial quantity, or is it the meaning of the Act that the question whether a thing is a poison or not depends upon the size of the bottle which happens to be sold of the particular compound.

The Master of the Rolls: That seems to me to go far to show that the Courts ought not to enter into any such question; but that if there are any of the prohibited things in it at all, a man must not sell it unless he be a duly qualified person.

Lord Justice Kay: A grocer could not sell the smallest possible amount of opium, although it would do nobody any harm, not even to the youngest infant. He has no right to sell any of it. Sections 1 and 2 absolutely prohibit him.

Mr. Bonsey: But the effect of that would be to prohibit him from selling proprietary medicines.

Lord Justice Kay: And a very good thing too.

Mr. Bonsey: It is not everybody who thinks so, my Lord. I mean they are useful medicines, especially to poor people who have not an opportunity of going to chemists and druggists.

The Master of the Rolls: Are you sure that those which are, as you say, useful to poor people, have any poisons in them? Unless they have they may sell them as much as they like.

Lord Justice Kay: Is it not perfectly notorious that children have been killed in a very great number by taking these things containing poisons?

Mr. Bonsey: There was no evidence at all that any child was ever killed by taking Powell's balsam of aniseed. They were challenged with that at the trial, and no evidence was given of it.

The Master of the Rolls: I thought that most of the medicines you were speaking of had really nothing in them. They cure people, as I have been told by doctors, by reason of faith. A doctor once told me: "I cannot cure you unless you have faith in me;" on which I answered him that he would not cure me at all, for I had no faith in him.

Mr. Bonsey: Take such a thing as a cough lozenge.

Lord Justice Kay: There are plenty of ingredients for making quack medicines without taking those in the schedule.

The Master of the Rolls: Do you mean to tell us that when we take cough lozenges we always take poison in them?

Mr. Bonsey: Nearly always, my Lord—you take morphine.

The Master of the Rolls: I will take no more, then.

Mr. Bonsey: As a matter of fact, in the British Pharmacopœia there is a morphine cough lozenge prescribed.

The Master of the Rolls: Do you mean to say that a grocer may sell that?

Mr. Bonsey: If Piper's case is right, he cannot. They are sold by grocers and hucksters all over the country.

The Master of the Rolls: If what you say about them is true, they had better not.

Mr. Bonsey: I am only saying it is convenient to poor people that they should have the opportunity of getting these things.

The Master of the Rolls: It may be for the convenience of poor people that they should be poisoned for anything I know.

Mr. Bonsey: But they do not poison themselves with cough lozenges. I suppose if a man liked to take two or three boxes all at once he might make himself ill, or poison himself, but that applies to so many things.

The Master of the Rolls: I rather agree with you: but that seems to lead to the conclusion that we had better say that if they sell anything in which there is a poison we will inquire no more about it.

Mr. Bonsey: May I point out this: If that is the object of the Act, then section 17 is most inaccurately expressed, for this reason: If the object is that the person who sells the medicine should know what it contains, then neither a chemist nor a grocer knows the contents of these things.

The Master of the Rolls: Stop a minute. Do not say neither a chemist nor a grocer, because a chemist—if he likes—can analyse the thing and find out.

Mr. Bonsey: Pardon me, my Lord. It is an extremely difficult thing if you produce to a chemist a bottle of stuff, and do not give him any indication of what is in it, to ascertain the actual composition. They have to analyse for almost every poison there is.

The Master of the Rolls: A chemist, I thought, could analyse a thing and find out for you directly what it contained.

Mr. Bonsey: As a matter of fact, one knows that if you go into a chemist's shop and ask for a bottle of Powell's balsam or a cough lozenge the chemist does not know what the ingredients are.

The Master of the Rolls: I do not agree with you at all. I think probably he has in his laboratory tried the lozenges and found out what is in them.

Mr. Bonsey: These proprietary medicines are secret nostrums, and are so called in the Revenue Act. If a man sells what is called a secret nostrum as a remedy for a specific disease he has to pay duty. They are stamped with the government stamp. The chemist does not know any more than the grocer what the contents of that bottle are.

The Master of the Rolls: I doubt it. I should think he did.

Lord Justice Smith: Why were patent medicines exempted? Why are they kept out?

Mr. Bonsey: I contended in Piper's case, and I still submit it is correct, that the word "patent" in that section includes proprietary medicines.

The Master of the Rolls: Which are not patented?

Mr. Bonsey: And so Mr. Justice Collins seemed to think for some time. For this reason: There are really scarcely any patent medicines in existence, but there are hundreds of proprietary medicines, and so there were at the time this Act was passed.

Lord Justice Smith: Are Holloway's pills a patent or proprietary medicine? There was an enormous compensation case about Holloway's pills in the Strand, one of the largest trade cases ever tried.

Mr. Bonsey: It was never patented, I am told, my Lord.

Lord Justice Smith: I mean the case when he was removed, for the building of these courts I think, and he had an enormous trade claim. I only wanted to know whether his was a patent medicine.

Mr. Bonsey: No, my Lord, neither are Cockle's pills. They are not patented. They are proprietary medicines.

Lord Justice Smith: But there are patent medicines, I suppose.

Mr. Bonsey: Extremely few. I think thirty, and only three of those contain poison. I think that was the evidence in Piper's case, and I forget how many hundreds of proprietary medicines.

Mr. Crump: The ingredients are all known in patent medicines.

Lord Justice Smith: I know. That is why I asked.

Lord Justice Kay: You do not obtain a patent without some investigation.

The Master of the Rolls: If it is a new invention, could the Attorney-General refuse his fiat. I think he used to refuse in the old days, if the article to be patented contained a poison.

Mr. Crump: I believe so, my Lord.

Mr. Bonsey: I should think it is very doubtful whether you could patent a medicine at all in the strict sense of the term.

The Master of the Rolls: If somebody invents a new compound and it is patented, and somebody else sells that compound, of course it would be an infringement of the patent.

Mr. Bonsey: Let me illustrate it in this way. Suppose a doctor prescribed for a person who was dying, a patent medicine; would that be an infringement of the patent?

The Master of the Rolls: Doctors never do prescribe these patent medicines.

Mr. Bonsey: I contend that "patent" in section 16 really includes these proprietary medicines—that the word "patent" is a word meaning proprietary medicines. They are not called proprietary medicines by the ordinary public. The common term—for all those medicines which are sold with a stamp upon them—is patent medicines.

The Master of the Rolls: There is no such rule of interpretation.

Mr. Bonsey: Yes, my Lord, I want to point that out.

The Master of the Rolls: You are poisoning our minds with your compounds.

Mr. Bonsey: What I want to say with regard to section 17 is this: I want to make this point clear, if I can. In section 17 anybody who sells one of these poisons, or a compound containing a poison, if it is in part 1, even if he is a chemist, has to enter in a book the quantity of the article sold. Now Mr. Justice Collins in Piper's case said he could get out of that difficulty by construing the word "article" in one part of the section in a different way to "article" in the latter part of the section. When you speak of "article" in the first part of the section it means the poison itself, but when you speak of "article" in the latter part of the section it means the compound which is sold. He said that but for that interpretation, which I submit is an incorrect one, with every respect to the learned judge, that the chemist cannot possibly comply with the regulations of the Act, and I submit that this impossibility shows that it was not the intention or the object of the Act to apply to proprietary medicines.

Lord Justice Smith: Why should not the man who made the medicine originally describe it outside the bottle, and put a small label on the bottom with the word "Poison?"

Mr. Bonsey: That is not sufficient; it is in part 1.

Lord Justice Kay: No, it can only be sold by a chemist.

Mr. Bonsey: And he has to enter the ingredients in a book with the date of the sale, the name and

address of the purchaser, and the name and quantity of the article sold.

Lord Justice Kay: He must be a chemist and druggist within the meaning of this Act, and be registered under this Act, and sell in conformity with the regulations.

Mr. Bonsey: Yes; he has to enter the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, the purpose for which it is wanted, and that entry must be attested by signature. Now, I say, the article sold means the poison, not the compound, because in the first part of the schedule it means the poison.

Lord Justice Smith: If you are selling under the first part of schedule A, you must be under the first part of section 17, must you not, as well?

Mr. Bonsey: Yes, my Lord.

Lord Justice Smith: First of all you must put on the bottle the name of the seller and the word "poison." Then, if you are in part 1 of schedule A, you are to go further.

Mr. Bonsey: Then you go through the formality of entering the quantity of the article sold.

Lord Justice Smith: This case in the first part of section 17 is not in schedule A at all.

Mr. Bonsey: I am using it as an argument to show that the Legislature could not have intended that it should have been applied to the sale of what everyone knows is a secret preparation, that is, a proprietary medicine, since no one, not even a chemist, could sell a proprietary medicine under those conditions, because he could not enter the quantity of the article sold.

Lord Justice Kay: There must be many proprietary medicines which do not contain any ingredients in this schedule. They are harmless enough, and can be sold by anybody; but if they contain ingredients in the schedule, why should not the Act apply to them?

Mr. Bonsey: It would prohibit their sale altogether.

Lord Justice Smith: I do not follow you, Mr. Bonsey, I am sorry to say. Why would it not do to enter in the book the name of the person who applies for it, what he wants it for, and the name of the article?

Mr. Bonsey: Because the article means the poison, not the compound.

Lord Justice Smith: Where do you find that?

Mr. Bonsey: If you will look further down the section—

Lord Justice Smith: Before you get to that word "article" it begins: "It shall be unlawful to sell any poison," and so on, "unless the box, bottle," etc., "be distinctly labelled" with the name of the article, and the word "poison"

Mr. Bonsey: But this is where I get the argument. At the bottom of the section it says that "the provisions of this section shall not apply to any article when forming part of the ingredients of any medicine." Therefore, the word "article," in the lower part of the section, is clearly used as referring to the poison, and in section 2 it is used to the same effect.

Lord Justice Smith: How far is that down?

Mr. Bonsey: Near the end of the section. "Shall not apply to articles to be exported from Great Britain by wholesale dealers, nor to sales by wholesale to retail dealers in the ordinary course of wholesale dealing, nor shall any of the provisions of this section apply to any medicine supplied by a legally qualified apothecary to his patient, nor apply to any article when forming part of the ingredients of any medicine, etc."

The Master of the Rolls: "Dispensed by a person registered under this Act." You leave that out.

Mr. Bonsey: What I am pointing out there is, that there the word "article" means the poison, the ingredient; not the thing sold, not the bottle of medicine.

The Master of the Rolls: What do you get from that? If it is an article with two grains of strychnine in it, why is he not to put down two grains of strychnine? Here is schedule F, which says you are to put the date, the name and address of the purchaser, the name and quantity of the poison sold, the purpose for which it is required, and the signature of the purchaser, or of the person introducing him.

Mr. Bonsey: He cannot do it, my Lord.

The Master of the Rolls: Why not?

Mr. Bonsey: Because he does not know.

The Master of the Rolls: Then he should not sell it.

Mr. Bonsey: That would prohibit the sale of proprietary medicines.

The Master of the Rolls: Except by properly qualified persons.

Mr. Bonsey: One knows that there is scarcely any antibilious pill that does not contain poison of some kind.

The Master of the Rolls: You seem to know a great deal about medicine. I do not in the least doubt you do; but I have not any faith in you if you tell me that all antibilious pills contain a quantity of poison. I do not believe that.

Mr. Bonsey: A very large number do, I am told.

The Master of the Rolls: That is another matter. I do not believe it. I have read some prescriptions given by great doctors for antibilious pills, and I never saw any poison in their prescriptions.

Mr. Bonsey: Then all I say is that Mr. Justice Collins dealt with Piper's case by saying that in the first part of the section the word "article" meant the bottle of stuff which was sold, but in the latter part of the section it meant the poison.

The Master of the Rolls: I am not sure he is not right. Why not?

Mr. Bonsey: Why should a different interpretation be put on the same word?

The Master of the Rolls: Because the context obliges you.

Mr. Bonsey: Why should you say that "article" all through the Act is used to designate the poison, and in one particular place to mean the compound.

The Master of the Rolls: If the context obliges you to say so in a particular section, you have to say so.

Mr. Bonsey: My submission is that it is giving a strained construction to apply a different definition to the same word in the same section. Surely the object of the Act was to apply to the sale of all proprietary medicines, of which one of the ingredients was a poison. It would have been very simple to have said so in the first part of the section.

The Master of the Rolls: To plain minds I cannot understand, if you were not to sell poison, how it can be said that you do not sell poison, if you sell a compound in which there is a poison. You sell poison. To a plain mind that seems to me clear.

Mr. Bonsey: Because the Act itself only deals with poisons and their preparations.

The Master of the Rolls: That is begging the question, as it seems to me. The Act in the first or second section says you must not sell a poison.

Mr. Bonsey: Poisons are defined in the schedule to the Act.

The Master of the Rolls: Those articles which are mentioned in the schedule.

Mr. Bonsey: Those things and their preparations.

The Master of the Rolls: The first or second section comes to this: you must not sell the poisons named in the schedule. Then if you sell something with these poisons in them, you sell those poisons, to my mind.

Mr. Bonsey: My submission is that the Act says you shall not sell those poisons or preparations of those poisons. What the Pharmaceutical Society is doing here is endeavouring to give the meaning "pre-

paration" to the word "compound," which is entirely different.

The Master of the Rolls: What is the difference?

Mr. Bonsey: That a compound contains a preparation, but a preparation may not be a compound.

Lord Justice Kay: Take this case: Suppose you mix together: all the articles in the first part of the schedule, according to your argument, you might sell them?

Mr. Bonsey: No, my Lord.

Lord Justice Kay: Why not? It would be a compound.

Mr. Bonsey: The whole compound would be a preparation of all the poisons.

Lord Justice Kay: You say a compound is not a preparation?

Mr. Bonsey: Then, my Lord, may I put another extreme case. If you put one-tenth of a grain of one of these poisons with fifty other drugs, could you call the result a preparation of that first drug?

Lord Justice Kay: You would be selling one-tenth of a grain of that drug which you are prohibited from selling.

Mr. Bonsey: You are not selling the preparation of it.

Lord Justice Kay: Never mind the preparation; you are selling the one-tenth of a grain of that, and you are not allowed to sell the smallest fraction of it, because you are not a qualified chemist.

Mr. Bonsey: I do not know that I can say any more upon that point, my Lord. My submission is that such was not the object or intention of the Act.

Lord Justice Kay: The answer to you seems to me to be this: If your argument is right, it would be the easiest thing in the world for anybody to evade this Act. Indeed, I do not see how you could get over what I have just put to you. If your argument about compounds be right, you could compound any two, three, or four of the poisons mentioned in the schedule, and then say you were not selling a preparation of any one of them.

Mr. Bonsey: I can only answer that by saying that compound and preparation are not really the same thing; obviously they cannot be.

Lord Justice Smith: Take chloroform, where you have no preparations added in the schedule. Suppose you sell chloroform—take a bottle half chloroform and half water—do you not sell chloroform?

Mr. Bonsey: That would be simply diluted. There are chloroforms of different strengths.

Lord Justice Smith: Suppose you take a medicine bottle and fill it up half with water and the other half with chloroform, do you not sell chloroform?

Mr. Bonsey: I think you would there.

Lord Justice Kay: Suppose you half filled the bottle with brandy?

Mr. Bonsey: There is brandy of different strengths also.

Lord Justice Kay: Would not that be selling chloroform?

Mr. Bonsey: I do not know that it would.

The Master of the Rolls: Can you say that it would not?

Lord Justice Kay: Supposing he were to put a few drops of chloroform into a bottle of brandy, I should not call that selling chloroform.

Lord Justice Smith: Then you come to *de minimis*.

The Master of the Rolls: What is it—a preparation of brandy?

Mr. Bonsey: I should call it brandy.

The Master of the Rolls: Very well. If it was brandy *cadit questio*.

Mr. Bonsey: That is my point as to the object of the Act. Of course, it may be that there was an omission in the Act; but what I say is that the object of the Act was never to include every proprie-

tary medicine, or every medicine in which one of the ingredients was a poison. Then if it was, I say that in this particular case there was really no evidence that the article sold was a poison.

The Master of the Rolls: What do you mean by a poison? Is not a thing a poison which will poison somebody?

Mr. Bonsey: Does it then depend upon the quantity? Quantity surely cannot be an accurate definition of a poison. Apart from the Act altogether, when you talk of a thing which is a poison—suppose you poison yourself—anyone may poison himself with wine, or brandy, or many things.

The Master of the Rolls: No, I beg your pardon. Let us use words in their ordinary sense. Except in the views of—I do not know what you call them—the Temperance Society, a man does not poison himself with drinking beer, I suppose?

Mr. Bonsey: But it would be possible to do it if you took sufficient.

The Master of the Rolls: He does not poison himself.

Mr. Bonsey: There are numerous things—

The Master of the Rolls: You are not going to tell us—unless you are a follower of my dear good friend, Sir Wilfrid Lawson—that beer is a poison?

Mr. Bonsey: No, my Lord, I should hope not.

The Master of the Rolls: You would not say so, would you?

Mr. Bonsey: I should have been dead long ago.

The Master of the Rolls: If you drink any amount of something which is not a poison, how can you poison yourself? That sounds like a puzzle.

Mr. Bonsey: Then the answer is—what is a poison?

Lord Justice Kay: The Act says certain things are poisons, at any rate. We have not to determine that question, because the Act says opium and all preparations of opium are to be deemed poisons.

Mr. Bonsey: Then, my Lord, does it depend at all on the quantity, or not?

Lord Justice Kay: Not the least. The Act prohibits the sale of any quantity whatever of the things which are in the schedule, except by a qualified person.

Mr. Bonsey: Then suppose they prove that in any of these proprietary medicines there is a hundredth or a thousand part of a grain of morphine?

Lord Justice Kay: *De minimis* is the answer to that.

Mr. Bonsey: Then, my Lord, if that principle applies, it must come to a question of quantity.

Lord Justice Kay: The answer to that is, you come within the Act, but we shall not impose a penalty for such a trivial thing as that.

Mr. Bonsey: Then surely it is a question of quantity if that maxim applies, because you must investigate in each case in order to see whether it contains sufficient to poison.

The Master of the Rolls: No, infinitesimal.

Mr. Bonsey: Then what is infinitesimal? In *Delve's* case, for instance, the analyst found that there was more than a trace, and it might be the quantity was one-fiftieth of a grain per ounce, or three-fiftieths of a grain in the bottle.

The Master of the Rolls: What sized bottle; one of those things somebody held up just now?

Mr. Bonsey: An ounce bottle, I think it was.

Lord Justice Smith: Do I understand that the bottle was sold by a grocer without the label "poison" upon it?

Mr. Crump: Yes; that is the original bottle.

Mr. Bonsey: Was there the poison label upon it or not?

Mr. Crump: No.

Mr. Bonsey: Some have, and some have not. In a great many of these cases they have put the word

"poison" on them, with a notice that they are labelled "poison" in consequence of the decisions.

The Master of the Rolls: Then they comply with the Act. Since the cases came before the court they have begun to comply with the Statute.

Mr. Crump: And are registered chemists.

The Master of the Rolls: You want to discourage them.

Mr. Bonsey: As a matter of fact it is really a trade dispute between the grocers and the chemists. One wants to get the monopoly of the trade.

The Master of the Rolls: I know.

Mr. Bonsey: I do not know that I can add more. My important points are that: first there is no evidence of the thing being a poison in this case, because there is not legal definition of poison, that I know of.

The Master of the Rolls: If you drink wine and water, you do not drink wine?

Mr. Bonsey: No, my Lord: in one sense I do, in the other sense I do not. If anybody were to ask me to have a glass of wine and gave me a glass of wine and water, I should be disappointed, that is all; I should not take it for a glass of wine. Then, my Lord, I say there is no evidence that the article sold was a poison. Then there is the other point, that the Act was never intended to apply to proprietary medicines which are included in the word "patent" in section 16.

Mr. Moulton, Q.C., rose to address the court for the appellants.

The Master of the Rolls: What, you also; good gracious!

Mr. Moulton: My Lords, I am with my learned friend, and the point which I shall put before your Lordships is that the saving clause 16, says "nothing hereinbefore contained shall extend to or interfere with the business of any legally qualified apothecary nor with the making or dealing in patent medicines, nor with the business of wholesale dealers in supplying poisons in the ordinary course of wholesale dealing."

The Master of the Rolls: Where is that?

Mr. Moulton: Section 16, my Lord. Section 17, which comes afterwards, is of course not included in the saving clause, because it is "nothing hereinbefore contained," so that the scheme of the Act is that the precautions provided under section 17 shall be taken, whether or not you are within the saving clause. Now we are not proceeded against for not having taken the precautions under section 17, and I need not deal with that. It may be that section 17 with its precautions, which certainly have their value, applies to all cases, but I say that section 17 does not affect us here, because I am going to claim before your Lordships that we are free from section 16, because we come under the exemption given in section 16.

Lord Justice Smith: Patents?

Mr. Moulton: Of patent medicines; that is the sole point I intend to put before your Lordships.

Lord Justice Kay: Then you must tell us exactly what the meaning of patent medicine is.

Mr. Moulton: I submit with very great confidence, whether I shall in the least be able to persuade your Lordships to take the same view I do not know, that the term patent medicine has no other meaning at all than that it is another name for proprietary medicine, and, the best of my knowledge and experience it has no other meaning whatever.

Lord Justice Kay: Is there not some legislation about patent medicines? Is it not under some Act of Parliament that you have to obtain something which amounts to a patent?

Mr. Bonsey: That is the Revenue Act—the Stamp Act.

Mr. Moulton: To the best of my belief I have

never, to the best of my experience, heard of Letters Patent for a medicine. What I feel pretty certain of is this, that the word "patent medicine" is used as a phrase in the English language. It does not mean, and never has meant, medicines for which Letters Patent have been granted; but it does mean medicines which are sold with the revenue stamp of this kind, and are always called patent medicines. It is a question of interpretation of the English language, and I want to point out to your Lordships why it was that they were excluded. My Lord, this Act, if I understand it rightly, is an Act to prevent dispensing by incompetent persons. That is what it was primarily directed against. Secondly, in section 17 it went on to insist upon certain precautions being taken in the sale of deadly articles. Primarily, and during the whole of the first part of the Act, it was against dispensing by unqualified persons who were unskilful, and I believe, if I remember rightly, the very preamble of the Act points to that as its aim.

The Master of the Rolls: You mean to say a grocer is an unskilful person?

Mr. Moulton: Yes, my Lord, but the point about proprietary medicines is that the retail dealer does not dispense it; it is all made up for him. It has a stamp, and it cannot be tampered with by him.

The Master of the Rolls: What do you mean by dispensing?

Mr. Moulton: It is not made by him; it is not concocted by him.

The Master of the Rolls: It is dispensing, not "concocting."

Mr. Moulton: I am dealing with what I suggest is the aim of the Act. The aim of the Act is to prevent persons concocting medicines who are not skilful. If you will allow me to refer to some of the earlier parts of the Act, I think you will find that was the reason.

The Master of the Rolls: Do you say that a grocer, if he concocted a medicine made up from a prescription by a medical man—a doctor—

Mr. Moulton: He could not sell it.

The Master of the Rolls: Because he would be dispensing it.

Mr. Moulton: There he would be dispensing it, I take it, by his agent; he might be a go-between.

The Master of the Rolls: No, not by his agent. A grocer could not sell it in his shop.

Mr. Moulton: If it was a medicine made up by a properly qualified person?

The Master of the Rolls: Yes.

Mr. Moulton: Well, my Lord, I do not suppose that he could unless that came under the head of proprietary medicines or patent medicines. The case which was excepted was the common case in which a retailer has nothing to do with the compounding of the medicine, and therefore his want of skill makes no difference. I am only stating my argument at the present moment. I will try to make it good, but I want to point out to your Lordships that there was a very good reason for excepting these proprietary medicines from that point of view. It makes no difference whether this is sold by a chemist or by a grocer. It comes exactly in the same way into the hands of the public. The fight here is merely a trade fight whether the highly lucrative business of transferring these things from the hands of the wholesale maker to the hands of the public shall be in two trades or in one trade. There is no difference whatever in the danger to the public when this passes from the hands of the druggist and when it passes from the hands of a grocer. Therefore, my Lords, when you come to the question of patent medicines that are put on the market in a form in which they are already compounded, and where they

cannot be tampered with, because your Lordship sees that they have a stamp over them, they were purposely excluded from the first fifteen sections of the Act. In my opinion, they are not excluded from the 17th section.

Lord Justice Smith: Is there a duty paid on each stamp?

Mr. Moulton: Yes, my Lord.

The Master of the Rolls: Under what Statute?

Lord Justice Kay: In the Act of 44 Geo. III. there is a schedule.

Mr. Moulton: And I think 15 Geo. IV.

Lord Justice Kay: That imposes a duty on certain things put in the schedule. There is a subsequent Act of George III. which says what medicines shall be considered patent medicines. I was just looking at it.

Lord Justice Smith: What is the other Act?

Lord Justice Kay: 52 Geo. III., cap. 150: "Whereas by an Act passed in the 44 Geo. III. certain ad valorem stamp duties were imposed on divers medicines and medicinal preparations specified and described in the Schedule of Drugs, Herbs, Pills," and so on.

Lord Justice Smith: I do not find the words there "patent medicines."

Lord Justice Kay: I was looking at the Index to the Acts of Parliament which enumerates patent medicines.

Lord Justice Smith: Is there a patent medicine there?

Lord Justice Kay: I am looking for it.

Lord Justice Smith: I have been looking also, and I cannot find the words "patent medicine."

Lord Justice Kay: There are medicines scheduled in the Act.

Lord Justice Smith: On which duty has to be paid.

The Master of the Rolls: What is the name of your medicine?

Mr. Moulton: Balsam of aniseed.

Lord Justice Kay: That is not in this schedule.

Mr. Moulton: If I remember rightly, I think all medicines sold under a proprietary title come under the stamp duties, and they are sold in this form.

Lord Justice Smith: Do you know what Act would impose that duty?

Mr. Moulton: I am not quite sure of it, but I will have that examined into.

Lord Justice Kay: There is a heading here: "Medicine, Patent Medicines, Stamp Duty on," in the Index to the Acts, and the Acts mentioned are the 52 Geo. III., the 44 Geo. III., and then there is one, 55 Geo. III.

Mr. Crump: In the Adulteration of Food and Drugs Act, 38 & 39 Vic., cap. 63, patent medicines are distinguished from proprietary medicines in section 6, where a drug or food is a proprietary medicine or is the subject of a patent in force.

Mr. Moulton: It may be that sometimes the two words, patent and proprietary medicines, may be used.

The Master of the Rolls: I see why this should have a stamp under 52 Geo. III. After all these enumerated things there comes a general paragraph: "All other pills, powders," and so on. "And all chemical and official preparations whatsoever to be used or applied externally or internally as medicines or medicaments for the prevention, cure, or relief of any disorder or complaint incident to or in any wise affecting the human body; made, prepared, uttered, vended, or exposed to sale by any person or persons whatsoever, wherein the person making, preparing, uttering, vending, or exposing to sale the same, hath, or claims to have, any occult secret or art for the making or preparing the same; or hath, or claims to have, any exclusive right or title to the

making or preparing the same, or which have at any time heretofore been, now are, or shall hereafter be prepared, uttered, vended, or exposed to sale under the authority of any Letters Patent under the Great Seal." You see there the occult secret things and the patent ones distinguished.

Mr. Moulton: Yes, my Lord, but the phrase "patent medicine" is commonly used for both.

The Master of the Rolls: I beg your pardon, but we cannot take that, even from you.

Mr. Moulton: It is for your Lordships to decide, but I am submitting that is the meaning.

Lord Justice Kay: Is it the meaning of it in an Act of Parliament where such things as actual patent medicines are mentioned as patent medicines and distinguished from proprietary medicines? In section 16 the words are "patent medicines."

Mr. Moulton: My Lord, there could have been no reason why patent medicines should have been excluded.

Lord Justice Kay: I do not know. I suppose before a patent is granted the nature of the medicine would be investigated.

Mr. Moulton: But if the patent has run out, are they no longer to have the privilege of being sold? It seems very extraordinary. I can understand a distinction between medicines that are sold with a stamp like this, so that the man who actually sells them to the public has no part or lot in the compounding of them. I can understand that, but it does seem to me strange to draw the line between those which are the subject of existing Letters Patent and those which are subject of Letters Patent which have expired. It appears to me that it could not have been a question of the patent being taken out. It must be a question of not being a case of dispensing in the ordinary sense of the word dispensing.

Lord Justice Kay: I think that would dispense with the Act of Parliament, Mr. Moulton.

Mr. Moulton: That is what I have to argue, of course. But it is quite clear that if it were sold by a chemist, and nobody says it cannot be sold by a chemist—

The Master of the Rolls: Nobody says that.

Mr. Moulton: Whether it is being sold by a chemist or being sold by a grocer, or anybody else, surely can make no difference. The article is independent of the person who retails it.

Lord Justice Kay: You are first of all to be sure that any chemist would sell it. Perhaps he would not.

Mr. Moulton: We should not be here if it was not an exceedingly profitable business. The Pharmaceutical Society is a society—

The Master of the Rolls: You must not go into that, Mr. Moulton. Please do not lead us away.

Lord Justice Kay: To poison people has always been exceedingly profitable.

Mr. Moulton: Yes, my Lord, that is the reason why the Pharmaceutical Society still exists, and is its sole merit.

The Master of the Rolls: You are using enigmatical language. Do you mean to say the Pharmaceutical Society exists for the purpose of poisoning people?

Mr. Moulton: For the purpose of keeping as far as possible the monopoly of poisons in a certain set of trading people. That is the object.

The Master of the Rolls: I should think no one would go to their Annual Dinner if that were so.

Mr. Moulton: I want to call your Lordship's attention to the object of the Act as stated by the preamble, and some of the earlier clauses.

The Master of the Rolls: We will hear that when we come back. [The Court adjourned for a short time.]

On resuming,

Mr. Moulton, continued: My Lord, I have sent for the Medicine Stamp Acts. The section has been read to your Lordship, and I shall call your Lordship's attention to section 2 of the 52 Geo. III. cap. 150. It says that "if any person or persons, whether licensed or not, shall utter, vend, or expose to sale, or offer, or keep ready for sale, whether for foreign or home consumption, etc., any packet, box, bottle," and so on, "mentioned and set forth in the schedule annexed to this Act, without a paper cover, wrapper, or label, provided and supplied by the commissioners of stamps, pursuant to the said Act of the forty-fourth year of His Majesty's reign, or to the Act of the forty-second year of His Majesty's reign, hereinafter recited, and duly stamped for denoting the duty charged on such packet, box, bottle," and so on, "being properly and sufficiently pasted, stuck, fastened, or affixed thereto, so and in such manner as that such packet, box, bottle," and so on, "cannot be opened and the contents poured out or taken therefrom without tearing such stamped cover, wrapper, or label, so as to prevent its being made use of again, then, and in such case, the person or persons so offending shall" pay a certain penalty. So that the way in which the whole of these stamped medicines are sent out is such that the stamp is a preventive against their being tampered with in any way.

The Master of the Rolls: Oh, no.

Lord Justice Kay: That is only to provide for the obliterating of the stamp.

The Master of the Rolls: It is a Stamp Act?

Mr. Moulton: Quite so, my Lord. If it is sold as these are sold I can account for the reason why I suggest proprietary medicines are exempted, as I say, with patent medicines. I put it that is the ordinary meaning of the word patent medicines.

Lord Justice Kay: Your difficulty there is that in this schedule, as the Master of the Rolls has pointed out, patent medicines are distinguished expressly from the other medicines.

Mr. Moulton: My Lord, not under that particular phrase "patent medicines."

Lord Justice Kay: Yes, indeed, "prepared, uttered, vend, or exposed to sale under the authority of any Letters Patent under the Great Seal."

Mr. Moulton: That is the phrase used in all these Stamp Acts, but the term "patent medicine" is not used at all. I say, my Lord, it is exactly like this: suppose it was a sale of patent leather, would you not be allowed to say that patent leather meant a particular form of varnished leather which was once patented perhaps. It is a well-known article of commerce.

The Master of the Rolls: Patent leather boots; I suppose that leather was originally patented.

Mr. Moulton: It may have been, my Lord; but patent leather means a particular article, and if your Lordships were to go to the Directory I think you would find that there is a regular trade of patent medicine vendors; but these patent medicine vendors are not people who sell medicines which are the subject of Letters Patent.

The Master of the Rolls: A Directory is not an Act of Parliament.

Mr. Moulton: What I suggest to your Lordship is this, that the word "patent medicine" was used in the ordinary meaning which it bears in use. The ordinary meaning which it bears in use is proprietary medicine bearing an Inland Revenue stamp. Those are called patent medicines. This was, no doubt, a clause put in to get off the opposition to this Bill of the persons interested.

Lord Justice Kay: Then this Act would read: "You shall not sell the poisons mentioned in the schedule unless you have a stamp upon them."

Mr. Moulton: Yes, my Lord.

Lord Justice Kay: That would make it nonsense.

Mr. Moulton: The nonsense is as great, I submit, if you exempt those which are the subject of Letters Patent. The precautions with regard to the sale of them in section 17 are just as applicable whether they are patent medicines or not; but the mischief of unskilful dispensing is got rid of when they are sold in this form. I submit to your Lordship, when you come to look at the earlier part of this Act, it is directed against unskilful dispensing.

The Master of the Rolls: Suppose a man who concocts one of these medicines sold a cough lozenge, if you like.

Mr. Moulton: Sells it wholesale?

The Master of the Rolls: No, makes it up in these bottles, and then a person without any skill takes and sells it. Mr. Bonsey says that the chemist could not tell what was in it. I do not believe him. I should like to ask you with all your skill if you could not take it to your laboratory, and tell me how much poison there was in it?

Mr. Moulton: But if you go to a chemist's shop to buy it in any quantity without a prescription, you know that nothing depends on any skill on the part of the man who sells it. What is the difference between going into Mr. A's shop or Mr. B's shop to buy it?

The Master of the Rolls: Because the chemist, if he undertakes to sell such a thing as that, ought either to analyse it—not every bottle, of course—but to analyse the sort of thing it is. If he does not, he sells it at his risk.

Mr. Moulton: There is no penalty at all on the chemist who sells this.

Lord Justice Kay: There is a penalty on his reputation.

Mr. Moulton: No more than a penalty on the reputation of any other person who sells it.

Lord Justice Kay: He would put the word "poison" on it, would he not?

Mr. Moulton: That is not distinctive. That applies to everybody who sells. I may call attention to the fact that when you come to section 16 it says: "Nothing hereinbefore contained shall apply" to this. That which comes after applies to the sale of poisons. Supposing, for instance, this ought to have the word "poison" on when it is sold, what does it matter whether it is sold by a druggist or a grocer?

Lord Justice Kay: You might say that of every one of the things in the schedule to the Act. It must have the poison label upon it; therefore what would it matter who sells it?

Mr. Moulton: It does matter if there is any dispensing.

Lord Justice Kay: What do you mean by "dispensing"? The Act provides against selling or compounding either.

Mr. Moulton: I submit that the meaning of the Act was that nobody should do any act which implied dispensing unless he were a skilled dispenser.

The Master of the Rolls: What do you call "dispensing"?

Mr. Moulton: Concocting the medicine itself.

The Master of the Rolls: You say "dispensing" means concocting?

Mr. Moulton: In the same sense as the word "dispensary" is used. I am using it in that sense. I may be wrong in using it in that sense, but what I mean is this: it was intended to prevent unskilled persons mixing, or preparing by mixing, medicines.

Lord Justice Kay: Or dealing with them in any way—selling.

Mr. Moulton: Except these patent medicines, which—as they were sold in a form in which they passed into the hands of the public without the retail dealer having anything to do with their composition—

were, I submit to your Lordship, excluded for that reason.

The Master of the Rolls: Then the most deleterious stuff that could be concocted, or what you choose to call it, may be sold by anybody if he does not make it up.

Lord Justice Kay: And if he gets a stamp on it.

Mr. Moulton: It can be sold then by retail. Take the case of Letters Patent; suppose you take Letters Patent out for a medicine for some serious disease with poisons in it. That of course would be a good subject-matter for a patent if any medicine is, although it was of very serious strength, if it was directed against some specific disease. That, unquestionably, could be sold by a grocer.

Lord Justice Smith: Are you not asking us to read into this 16th section the word "proprietary"—"any patent or proprietary medicine?"

Mr. Moulton: I say "patent medicines" includes proprietary medicines. I say that the term "patent medicine" is the English for medicines of this class. If it is a question as to the meaning of the term, I say with great confidence, my Lord, that you could prove that to be the ordinary meaning in which this word "patent" was used.

The Master of the Rolls: How can you prove that? I want to know how you prove that?

Mr. Moulton: Because as an example you would find in a Directory "patent medicine vendors." I doubt whether such a thing as Letters Patent for a medicine exist. I have never in the course of my experience come across a patent for a medicine. Patent medicines are as common as possible, but that does not mean medicines under the authority of Letters Patent under the Great Seal, which is the phrase used in these Stamp Acts. The term simply means proprietary medicines sold under stamps.

Lord Justice Smith: If patent medicines are mentioned in the Stamp Acts there must be such things.

Mr. Moulton: My Lord, that is an authority; I can believe that you can have a good subject-matter for Letters Patent in a medicine. It is a thing which I think you would have to go to the authority of these Acts to establish, but still I say that these are practically unknown, and yet "patent medicine vendor" is a well known term. I say that "patent medicines" is a current phrase bearing that meaning.

Lord Justice Kay: The Legislature does not say so. In the 52 Geo. III. there is the distinction.

Mr. Moulton: It expresses them more carefully. It says medicines sold under the authority of Letters Patent under the Great Seal. That is the phrase used in each of those Stamp Acts. The simple phrase "patent medicines" is not used in any of those Acts. I say that "patent medicines" is just a common name for these proprietary medicines.

Lord Justice Kay: If you speak of patent articles, certainly you mean articles for which you have obtained a patent under the Great Seal.

Mr. Moulton: Because as far as I know there is no such thing in other articles as these things sold with a special stamp.

Lord Justice Kay: Nor is there, except in your argument, any medicine which is a patent medicine, except those which have been the subject of a patent under the Great Seal.

Mr. Moulton: Your Lordship says there is nothing excepting in my argument; but if your Lordship were to go and ask chemists and druggists, they would say that "patent medicines" included proprietary medicines.

Lord Justice Kay: Have you any evidence of that in this case?

Mr. Moulton: We have not in this case, but evidence was called in Piper's case, and evidence could be called of that kind if the evidence be admissible.

Lord Justice Kay: I do not think that evidence would help you at all, because it would only show that a very loose use of the word "patent" had obtained, perhaps even before this Act of Parliament was passed, but it does not follow that such looseness was adopted in the Act of Parliament.

Mr. Moulton: No, it does not follow, but I suggest to your Lordship that was the meaning in which the term was used. Of course the vendors of patent medicines were a very strong body. I believe they opposed this Act.

Lord Justice Kay: What importance to you is it whether it is a proprietary medicine or stamped medicine or what?

Mr. Moulton: These are proprietary medicines.

Lord Justice Kay: I know, but is it necessary for your defence that an article should have a stamp upon it?

Mr. Moulton: Yes, my Lord, it is in this way, because the medicines which are called patent medicines must be sold with a stamp.

Lord Justice Kay: There are a great many medicines which are proprietary medicines, I suppose, which have no stamp?

Mr. Moulton: No, my Lord, there cannot be.

Lord Justice Kay: Why?

Mr. Moulton: Because it would be against the Stamp Act.

Lord Justice Kay: If they are not secret preparations? Are those horrid things they advertise by the boards in the fields which we pass on the railway all stamped?

Mr. Moulton: Every one of them, my Lord, that is sold.

Lord Justice Kay: Because they are secret preparations.

The Master of the Rolls: Beecham's pills.

Mr. Moulton: I am not specially friendly to those things, but I do press on your Lordship that patent medicine is the ordinary name by which they go.

Lord Justice Kay: See what it comes to. A patent medicine according to you is a medicine which has not necessarily got the advantage of Letters Patent, but it is a proprietary medicine which has a stamp upon it, that is all.

Mr. Moulton: A medicine which passes into the hands of the public in the same condition as it left the wholesale dealer. That is the reason why, as I suggest to your Lordship, they were excepted.

The Master of the Rolls: You have to read so much into the Act of Parliament.

Mr. Moulton: The danger is exactly the same with regard to patent medicines as with regard to others.

Lord Justice Kay: There may be what are called patent medicines without any poisons in them.

Mr. Moulton: There may be, my Lord.

The Master of the Rolls: But a proprietary medicine, although it has poison in it, may be sold?

Mr. Moulton: Yes, my Lord.

Lord Justice Kay: If somebody chooses to mix two or three of the poisons in the schedule and sell them as a proprietary medicine with a stamp upon it he would be exempted by the very Act which says nobody shall sell those poisons unless he be a chemist.

Mr. Moulton: Exactly the same thing, in fact a worse, applies to Letters Patent. Suppose there is a really dangerous medicine.

Lord Justice Kay: A patent would not be readily granted for it, would it?

Mr. Moulton: Oh, yes, my Lord, if it were useful for certain purposes. Take the case of those medicines which are used in the more dangerous forms of heart disease, which are very powerful and necessary, and are very rightly considered useful medicines. A person takes out a patent for such medicine.

The Master of the Rolls: Does he?

Mr. Moulton: I do not believe, my Lord, he does. I do not believe the word "patent" is really applied to medicines other than these proprietary ones: but suppose he does, then anybody could with his permission actually dispense that, whether they have skill or not, and they are not interfered with by this Act, whereas, if you take the term patent to mean medicines with the composition of which the retailer has nothing to do, then it appears to me that the legislation is consistent, although I do not defend it.

Lord Justice Kay: The legislation would be the most idiotic conceivable if that were the meaning of it.

Mr. Moulton: It seems to me, if I may say so, that if the Act does not intend to deal with all the evils with regard to poisons, but only with unskilful dispensing, it might be very reasonable to expect that skill should make no difference where the retailer is not the dispenser in the sense in which I used the word dispensing, that is, the person who makes up the medicine. What difference is there whatever in a person selling it who is a grocer, or a person selling it who is a druggist? Of course I am putting before your Lordships that patent medicine is the ordinary colloquial name for these medicines. I have now shown more than that, that they are free from the difficulty of unskilful dispensing. I quite agree, my Lord, that there ought to be legislation of some kind to deal with the matter; but I submit that was not the object of this Act.

Lord Justice Kay: According to you, medicines might be made up by any person without the slightest chemical skill or knowledge; and if they have the stamp upon them, so that they may be called proprietary medicines, although they contain the most potent poisons, they may be sold by anybody.

Mr. Moulton: Your Lordship is somewhat criticising the legislation.

Lord Justice Kay: No; I am trying to show what is not within the legislation.

Mr. Moulton: Ordinary proprietary medicines are medicines made up wholesale by some person and sold by him in a form in which they are not altered. Now, the wholesale trade is specially exempted from this Act. In fact, it might be said to be an Act for precaution with regard to the sale of poisons, except in large quantities. You can sell poisons wholesale; but you may not, as I submit to your Lordship, dispense poisons unless qualified to do so.

The Master of the Rolls: If he is confined to skilled persons who are to dispense, as you call it, then the wholesale dealer sells to them, because he cannot sell to the others, since the others cannot sell it.

Mr. Moulton: Yes, my Lord; but he can sell to anybody.

The Master of the Rolls: If anybody will buy. But if they can only buy on the terms that if they sell they will have to pay a £10 penalty, they will not buy.

Mr. Moulton: What is the advantage of selling to the skilled. They have nothing to do with the medicine. It never changes its form.

The Master of the Rolls: I do not know about that. I do not say it does, but they ought to take care. I cannot accept the view that these people cannot tell what is in the medicine. They can.

Mr. Moulton: Might I point out to your Lordship the Act does not make chemists and druggists skilled in poisons in any way at all. It is only for the purpose of seeing that they are skilled in dispensing.

The Master of the Rolls: Skilled in what?

Mr. Moulton: In dispensing.

The Master of the Rolls: Do you mean in selling?

Mr. Moulton: No, my Lord, in taking a prescription and properly making it up; they are skilled in that. They are not to be persons who are to prescribe. They

are not persons with any responsibility as to the effect of drugs. The one thing that this Act is intended to do is to provide that they shall not make blunders.

The Master of the Rolls: The section, I think, defines chemists and druggists—"chemists and druggists within the meaning of this Act shall consist of all persons who, at any time before the passing of this Act, have carried on in Great Britain the business of a chemist and druggist, in the keeping of open shop for the compounding of the prescriptions of duly qualified medical practitioners."

Mr. Moulton: Precisely what I submit; that they had been engaged in making up medicines, and that they were the persons who might make up poisons.

The Master of the Rolls: They are the persons who, by the Act of Parliament, may sell poisons.

Mr. Moulton: I know, my Lord. I submit they are the people who may not make poisonous mixtures and sell them.

The Master of the Rolls: Who may?

Mr. Moulton: Yes, my Lord; who "may" make mixtures and sell them; but I submit it was directed to secure trade skill in compounding—perhaps compounding is a better phrase than dispensing.

Lord Justice Kay: You out the word "sell" out of section 1, which says it shall be unlawful for any person to sell or keep open shop for the purpose of retailing, dispensing or compounding, etc.

Mr. Moulton: But for the exemption in clause 16 that word "sell" would be fatal to my contention.

Mr. Justice Kay: Unless you can say this is a patent medicine your contention fails.

Mr. Moulton: Yes, my Lord, I quite admit that. I did not intend to put this portion of the argument on any other ground. If your Lordships come to the conclusion that I am wrong in submitting to your Lordships that the term patent medicine is the ordinary name for proprietary medicine, and that it was so meant, then I quite agree that my argument fails. But if it was intended by this Act in the first sixteen sections to secure skill in the people who compound, then there is something reasonable in saying that medicines which they do not compound, but simply pass on, were not to be interfered with.

The Master of the Rolls: You go to this extent. You say the making or "dealing in patent medicines" means the making or dealing in proprietary medicines, however poisonous.

Mr. Moulton: They may be poisonous whether patented or proprietary.

The Master of the Rolls: There may be a difference. As you say, a patent would not be granted for a poison.

Mr. Moulton: It might be most useful. It might be a right patent.

The Master of the Rolls: It is against public policy to grant a patent to a man to make and sell poison.

Mr. Moulton: But, my Lord, it certainly might be a most important medicine, if it was for a special disease. You cannot be certain that the medicine will not be a poisonous medicine.

The Master of the Rolls: I see the difficulty about patented medicines as you say, because if a medicine could be patented, I suppose a physician could not write a prescription containing the same thing.

Mr. Moulton: That is why I should have said—if it had not been for the Stamp Act—there could not be such a thing patented. I am quite sure an injunction would not go from this court to prevent people writing a prescription which followed a patent in order to cure a person. I am sorry to find the statutes do recognise that there may be patents for medicines under the Great Seal, but, my Lords, I will not repeat myself further.

Lord Justice Smith: Suppose a man had a patented medicine with poison in it. If I understand this Act,

a chemist selling that would have to put "poison" outside it.

Mr. Moulton: Under the 17th section.

Lord Justice Smith: And if it were under part 1 of schedule A, he would have to adopt other precautions.

Mr. Moulton: Yes, and so would everybody. The grocer or anybody who could sell it and make it.

Lord Justice Smith: A patented medicine?

Mr. Moulton: Yes, because all the sections, down to the end of the 15th, are exempted in the cases of making and selling patent medicines.

Lord Justice Smith: I agree to that, but why do you add under section 17?

Mr. Moulton: My argument is that the 17th section applies to proprietary medicines and to those which are the subject of Letters Patent under the Great Seal.

Lord Justice Smith: I should have thought the 17th section applied to all poisons.

Mr. Moulton: Every one, because the 16th says: "Nothing hereinbefore contained."

Lord Justice Smith: I know it does.

Mr. Moulton: My case is that the precautions apply to all poisons, to proprietary medicines, to medicines under a patent, to everything; but I submit to your Lordships the sections from 1 to 15, relating to the precautions which secure that there should be proper persons to dispense poisons, do not apply to medicines which are made by wholesale men.

Lord Justice Kay: I should suppose that exemption of patent medicines was put in because there were so very few of them that they would not be of any importance.

Mr. Moulton: I should say quite the contrary. There were so many of them, they could not get the Act through without it. It appears to me it was put in to prevent the great opposition there would have been by people who owned proprietary medicines.

Lord Justice Smith: Was it not put in to save the rights of persons who had patents and nobody else? These proprietary people had no rights at all. They had no legal rights, but patentees had.

Mr. Moulton: No, my Lord. They had no legal right, and the patentee has no right except to prevent other people making.

The Master of the Rolls: What my brother says is rather important. Anybody might make it up and sell what you call a proprietary medicine, if they could find out the materials.

Mr. Moulton: Quite true.

The Master of the Rolls: Then proprietary is the wrong word; there is no property in it.

Mr. Moulton: Just as much as in those called patent medicines; proprietary medicine is not by any means a correct phrase.

Lord Justice Kay: But if, under the Great Seal, an exclusive right has been granted to A to make up and sell a particular kind of medicine, the Pharmacy Act surely only means that we are not going to interfere with and take that right away from him.

Mr. Moulton: He acquires no right to do the thing under his Letters Patent.

Lord Justice Smith: He acquires a right to stop everybody else doing it.

Lord Justice Kay: I said the exclusive right.

Mr. Moulton: Therefore there was nothing requiring protection or exemption.

Lord Justice Smith: It would interfere, I mean, with the patentee.

Mr. Moulton: No more than with any other person, my Lord, a man having as much right to make a non-patented article as a patentee has to make a patented article, every bit.

Lord Justice Smith: But the others are all the world, and patentees are a special class.

Mr. Moulton: I quite see there is that difference,

but the patentee has not any higher right to make his article than a man has to make what is open to all the world. I quite agree the one is a special class and the other is the whole world. It appears to me that the evil of unskilful dispensing would exist in the case of the patent medicines, whereas in the case of medicines which do not get interfered with at all by the persons who actually retail them it appears to me there was a reason for exempting them, not from the precautions which arise from the nature of the article in them after they have passed to the hands of the retailer, but from the precautions which deal with the skill of the person who does the compounding. My Lord, I will not repeat myself; that is my view with regard to that point.

The Master of the Rolls: Do you know what the examination is of a pharmaceutical chemist?

Mr. Moulton: It is an examination in the Pharmacopœia, in making up medicines. I believe it is a practical examination.

The Master of the Rolls: It says "competent skill and knowledge."

Mr. Moulton: I believe that chemists are not allowed to prescribe.

The Master of the Rolls: It says, "The examination aforesaid shall be such as is provided by the Pharmacy Act."

Mr. Moulton: The doctors attack chemists, and will not allow them to prescribe. It is only a question of skill in compounding, in making up the medicines of the duly qualified practitioner.

The Master of the Rolls: I wanted to know if the examination did not go further than that. What is the Pharmacy Act?

Lord Justice Kay: It must include the qualities of the drugs and their effects on the human frame.

Mr. Moulton: I cannot tell, my Lord. I know it includes a great deal of knowledge of the contents of the Pharmacopœia.

Lord Justice Kay: And the quantity of morphine that would be a fatal dose, and so on.

Mr. Moulton: I do not know whether it includes dosage or not; I know it includes such things as questions as to particular preparations in the Pharmacopœia.

Mr. Crump: It is mentioned in section 8 of the original Pharmacy Act. The examination under the provisions of this Act includes an examination in knowledge of the Latin language, in botany, in materia medica, and in pharmaceutical and general chemistry. That is in the Act of 1852.

Mr. Moulton: Now, my Lords, I have only one other point to put before your Lordships, and that is the question of the curious terms, "compounds" and "preparations." I submit it cannot be meant that any fraction of poison being present in a mixture makes that a preparation of the poison. If your Lordship will kindly look at the schedule of the Act, there is, for instance, prussic acid in the first part; then in the second there is essential oil of almonds, "unless deprived of its prussic acid." That recognises that essential oil of almonds will have, as it certainly has, a proportion of prussic acid in it, and yet it comes under part 2.

Lord Justice Smith: That is not so virulent as the other.

Mr. Moulton: No, and it is not subject to the same restrictions.

Lord Justice Kay: But it is a compound, you see, because they speak of depriving it of its prussic acid.

Mr. Moulton: What I point out is this: the mere fact that prussic acid is present in a fluid cannot bring it under the first head as being prussic acid, because if it did, essential oil of almonds not deprived of its prussic acid would also have to be under the first head. So, my Lords, I submit that the first

head means those things isolated, such as prussic acid.

Lord Justice Smith: Would not essential oil of almonds not deprived of prussic acid be prussic acid?

Mr. Moulton: No, my Lord; there would be prussic acid in it. I do not know what percentage.

Lord Justice Smith: It is a very violent poison.

Mr. Moulton: It is. Probably there would be, to give a guess, 4 or 5 per cent. of prussic acid in essential oil of almonds. I should doubt whether it would be stronger than that. Then if it is said that the mere presence of any proportion of a poison brings an article under the head of poison, those two schedules would certainly contradict one another.

The Master of the Rolls: It seems to me terrible to suppose that if you put some of these things in with other things, it gets rid of them altogether. Look at corrosive sublimate.

Mr. Moulton: If corrosive sublimate was present in very minute quantity—

The Master of the Rolls: In infinitesimal quantity. If you say you found an infinitesimal trace, we should hold that there was none.

Mr. Moulton: I submit it must be more than that, otherwise you cannot understand essential oil of almonds, not deprived of its prussic acid, being put in part 2, and prussic acid being put in part 1.

Lord Justice Smith: Is not essential oil of almonds a preparation of prussic acid?

Mr. Moulton: No, my Lord; it is got from the almonds themselves.

Lord Justice Kay: It is the substance from which prussic acid is made.

Mr. Moulton: Originally, I believe. We get it by roundabout methods now, which are cheaper.

Lord Justice Smith: Supposing you poisoned a person with essential oil of almonds, would you say he died of prussic acid?

Mr. Moulton: He would die of prussic acid poisoning.

Lord Justice Smith: Then the question would be whether it was prussic acid?

Mr. Moulton: That is what I want to point out to your Lordship. It is clear that the essential oil of almonds, not deprived of prussic acid, is only liable to the precautions in part 2, because it is specially stated.

Lord Justice Smith: If it is deprived of its prussic acid.

Mr. Moulton: If it is not deprived; of course if it is deprived of it, it is not a poison at all. It is out of the schedule altogether.

Lord Justice Smith: Yes, I see.

Mr. Moulton: I want to point out what I submit to you is the meaning of these schedules. I submit a poison is that of which a small quantity is fatal. Now if you take a strong poison and mix it with a very large amount of other matter it then becomes bulk for bulk, only equally poisonous with a thing which is far less poisonous. Let me give your Lordship this very case of essential oil of almonds which has prussic acid in. The dose of prussic acid which is fatal is infinitesimal compared to the dose of essential oil of almonds. Take the next case, opium, if you look in schedule A you will see "all poisonous vegetable alkaloids." Opium contains many poisonous vegetable alkaloids. If you isolate them, their poisonous character is terrible, and they are some of the most powerful poisons (that is, the smallest quantity will produce death). You may not sell these isolated, purified, intensified poisons without special precautions, but if you sell them in a form in which they are mixed with other matter less poisonous, so that they fall out of the rank of being terrible poisons which in very small quantities produce death, then they may fall into the second class.

Lord Justice Kay: It strikes me that your best

argument on section 17 itself is that if the other side be right in the extreme argument they will urge against you, no chemist could sell any medicine in which a small part of these poisons enters without labelling the bottle "poison."

Mr. Moulton: He could never sell it to anybody he did not know. There is not the slightest doubt that opium must contain a poisonous vegetable alkaloid.

Lord Justice Smith: Opium would only want the word "poison" outside, would it?

Mr. Moulton: That is all, whereas opium, because it contains a poisonous vegetable alkaloid, would require to be under the first class. I submit the first class means that those poisonous principles, when isolated, are immeasurably more dangerous than the stuff from which you get them. There is a most curious example, my Lord, of that in one of the additions to this schedule. Strychnine is put down in part 1 of the schedule.

The Master of the Rolls: Then chemists who, when you send a prescription of a physician to them, and they make it up and put "poison" on the bottle when they send it home, are doing what they need not do, according to you?

Mr. Moulton: It depends, my Lord; I think they are obliged to do it.

The Master of the Rolls: They do. You see it in every house into which you go. They put "poison" on the bottle which they make up from the prescription of the physician, so that the people of the house should not give it indiscriminately.

Mr. Moulton: Your Lordship is quite right—"Nor shall any of the provisions of this section apply to any medicine supplied by a legally qualified apothecary to his patient."

The Master of the Rolls: Section 17.

Lord Justice Kay: Section 17 requires "poison" to be put on the bottle.

The Master of the Rolls: They do put it, you know.

Mr. Moulton: They do, but they are not obliged to do it if they are druggists.

The Master of the Rolls: That is what I put to you. If you read section 17 in its simplicity, they are right in doing what they do.

Mr. Moulton: Yes, my Lord.

Lord Justice Kay: You say if this were made up by chemists they need not put "poison" on the bottle?

Mr. Moulton: No; they need not.

Lord Justice Kay: Why not?

Mr. Moulton: Because it is applied to a medicine supplied by a legally qualified apothecary to his patient.

Lord Justice Smith: I should think even if under "patent medicine" you got out under section 16, you would get in under section 17.

Mr. Moulton: I know we should, but the complaint is not under section 17.

Lord Justice Smith: I should think the patent medicine man would have to put "poison" outside.

Mr. Moulton: I think he would, and I have never said he would not.

The Master of the Rolls: He has only to put "poison" when he sells poison. Your argument has been throughout that in this case he does not sell poison.

Mr. Moulton: I was dealing now with the question of what was intended really to be the meaning of the word "poison." I was dealing with the argument that if there is any of the poison present you must look upon it as a case of selling that, and I point out that it cannot be so, otherwise these distinctions between the first and second part of the schedule would be contradictory, because you would find things are distinctly said to be under part 2, which according to that canon of construction would necessarily be under part 1.

Lord Justice Smith: I do not follow that. Prussic acid must be under part 1, must it not?

Mr. Moulton: Yes, my Lord.

Lord Justice Smith: There is nothing about essential oil of almonds in part 1 at all.

Mr. Moulton: No.

Lord Justice Smith: But essential oil of almonds not deprived of its prussic acid is under part 2.

Mr. Moulton: Yes, and it contains prussic acid.

The Master of the Rolls: That is the nature of the thing, that is not a compound.

Mr. Moulton: Therefore the presence of prussic acid does not necessarily bring the thing into the first part of the schedule: that is what I mean.

The Master of the Rolls: That is not prussic acid compounded with something else.

Mr. Moulton: Yes, my Lord, with all respect.

The Master of the Rolls: It may be, chemically.

Mr. Moulton: It is really a mixture; you can separate the two parts.

The Master of the Rolls: Who mixes it?

Mr. Moulton: It is mixed in the plant. Take this very case. We are accused here of selling morphine. As a matter of fact, there is no morphine put in here. There is opium put in, but in order to find out whether there is opium, the chemist tests for a definite alkaloid, and he finds morphine. They say there is one-tenth of a grain, but nobody could say—it would not be true—that you had isolated morphine, and then put in one-tenth of a grain. It is here, because it is part of the opium which was used. Of course, it is much more easy to test for the presence of morphine than opium.

Lord Justice Kay: It would be just as wrong to use opium.

Mr. Moulton: I want to point out that it cannot be taken in this Act that the mere presence of something in the schedule is sufficient.

The Master of the Rolls: Suppose it is opium?

Mr. Moulton: That would be in part 2 of the schedule.

The Master of the Rolls: Then you would be liable to the penalty.

Mr. Moulton: Then it ought to be labelled "poison," I submit.

The Master of the Rolls: Can anybody but a chemist sell it?

Mr. Moulton: Now I am going on to that.

Lord Justice Kay: If you do not get it out under "patent medicine" it is all the same.

Mr. Moulton: If I do not get it out under patent medicine I can only get it out under the next argument, which is one step further. I have pointed out that the mere presence of morphine does not bring it into the class, although morphine is in the first class, because we clearly see that pure opium can be sold under the second class. I submit just in the same way that where the opium is only a small proportion, only one ingredient, it would not come under the phrase "opium and all preparations of opium or poppies." I submit that refers to such things as are well known in the Pharmacopoeia.

Lord Justice Kay: Laudanum?

Mr. Moulton: Laudanum would be distinctly a preparation of opium. There are certain pharmaceutical preparations of opium which are used as forms in which opium may be put into medicines, but I submit, my Lord, that one ingredient, a small ingredient, in a medicine would not necessarily bring it under part 2 of the schedule. Otherwise, my Lord, anything that has got any opium in it would come under it—What is opium? I do not know. You have preparations of poppy heads, and those things, you have poppy water and everything of that kind, which would at once be said to be poisons.

Lord Justice Smith: Was it not the intention of

the Act that these things should be dealt with by the chemist, and not by the grocer?

Mr. Moulton: Anything which was substantially, I was going to say seriously, poisonous.

Lord Justice Smith: I do not see why a grocer should sell this stuff any more than a chemist should sell bread or sugar. The meaning of this Act was to confine these poisons—I use the words used in the Act—to the person who was skilled. I know your argument about patents.

Mr. Moulton: Yes, my Lord, I will not go over that again. Take arsenic and its preparations. It may be a very improper thing, but certainly arsenic is perpetually used as a dye. It may be used, for instance in some of our beautiful green colours, but I doubt very much whether it was intended that you shall not sell a green silk unless you were a druggist, because arsenic is often used very harmlessly.

Lord Justice Smith: In silk?

Mr. Moulton: Yes, my Lord, in dyeing silk.

Lord Justice Smith: Or in wall-papers?

Mr. Moulton: Yes, my Lord, sometimes it is used badly, and sometimes well, but it was never intended that the mere existence of arsenic in articles, if it was not in such a form that it became poisonous, should be interfered with.

The Master of the Rolls: We all know that this Act of Parliament is not applicable to wall-papers.

Mr. Moulton: I carry it a little too far perhaps, my Lord, if I say that, but it is not quite easy to imagine many cases in which there are small quantities present, which do not render the article poisonous. They do not render it what I may call substantially poisonous; that is, a thing of which a very small quantity will cause death, which is the definition of a poison. These are not all the poisons. These do not include one hundredth part of the things which, if taken, will produce death, but they are the things which if taken in small quantities will cause death. There are cases of death from petroleum, and death from such things as Condyl's fluid. All those things are poisonous, but they do not need to be specially guarded against, because they are not so poisonous that very small quantities will produce death.

Lord Justice Smith: They are not within the Act, are they?

Mr. Moulton: No, they are not. I say, just in the same way, if you take something which is in the Act, and put it into such a shape that it falls into the category of non-poisonous things—that is, things of which a considerable amount is requisite to cause death—I submit it was not intended that those should be within the Act.

Lord Justice Smith: I put it to you before, and I should like you to answer it if you can. Suppose a man half filled a bottle with chloroform and half with water and sold it, would he be selling chloroform or not?

Mr. Moulton: Yes, my Lord; if I may say so I should put it this way, I should say that is substantially a preparation of chloroform.

Lord Justice Smith: If he fills the bottle half with water, and then fills it up with chloroform, does he sell chloroform?

Mr. Moulton: With those proportions I should think your Lordship would probably say he does.

Lord Justice Smith: One other word, there is nothing about proportions in this Act.

Mr. Moulton: No, my Lord.

Lord Justice Kay: You could not deny that if chloroform were sold in such very small proportions as to be innocuous, it would still be infringing this Act.

Mr. Moulton: Because chloroform in any form is an exceedingly violent agent. Let me give your

Lordship an example. Chloroform mixes very readily with alcohol. Supposing a man sold alcohol with a small fraction, say 1 per cent., of chloroform in it, I should very strongly contend that that was not selling chloroform.

Lord Justice Smith: I should like to catch him if I could.

Lord Justice Kay: Do you mean to say that a man who compounded that would not be infringing this Act?

Mr. Moulton: I certainly think the man who compounded a thing like that would not be. I should submit he was not really selling chloroform. It would be chloroform used so as practically not to have the properties of chloroform. Let me give your Lordships an example. Chloroform is a very excellent solvent; it is used by painters in dissolving away their paint when they want to clean it off their pictures, and you can easily imagine that it might be used as a solvent for dissolving certain things, and mixed with these things in a very small proportion. What you would sell there would contain chloroform, but would not be called chloroform, would not be fairly called a preparation of chloroform. That is what I submit. You have to look at the ultimate form, and not merely say if you sell anything that contains that, you are selling that. Take another case, phosphorus, which is a very bad poison; you cannot sell bread without selling phosphorus in it. Nobody would say that it is phosphorus, it is in such very small proportions that the characteristics of phosphorus are not dominant. Therefore, I say, my Lord, even if these things are present, they are not present in such a form that the result is poisonous. They are not in anything like the same category as the original thing.

Lord Justice Smith: Curiously enough as regards this argument the words are "they shall be deemed to be poisons"—that is whether they are, or are not.

Mr. Moulton: "Deemed to be poisons."

Lord Justice Smith: Then chloroform, whether it kills or not, shall be deemed to be a poison.

Mr. Moulton: That is, to be brought within the Act.

Lord Justice Smith: Section 2.

Mr. Moulton: "Deemed to be poisons within the meaning of this Act," that is, the Act applies to them. That is what I am contending before your Lordships, that when you take these things, and they are sold as they are, not with any such modification as is sufficient to alter their poisonous character, then they are still within the Act.

Lord Justice Kay: The very fact that the Act has a limited operation, and is confined to certain things specified, or that may be specified afterwards under the provisions of section 3, shows I think that you ought to give a wide interpretation to those things.

Mr. Moulton: I should put the argument almost the other way, that it is only when they are in their strength that they are worse than hundreds of other things that are outside, and therefore when sold in such form that they do not manifest their strength, that they are then far less poisonous than things which may be sold without any restriction at all.

Lord Justice Smith: You want to read into this part of the Act "so long as they are poisonous."

Mr. Moulton: Yes, my Lord, if they are so much altered by being mixed with a very large quantity of other things—

Lord Justice Smith: You want it to read, "the several articles named or described in the schedule (A) shall be deemed to be poisons so long as they are poisonous."

Mr. Moulton: No, so long as they are sold as they are. The question is whether you are selling arsenic,

we will say, when you are selling a mixture of which it is a very small ingredient.

The Master of the Rolls: As to that part of your argument, Mr. Justice Collins quotes against it the case of *Berry v. Henderson*, in 1870.

Mr. Moulton: He held that the presence of a very small quantity did not make any difference.

The Master of the Rolls: He said if poison was one of the ingredients of what was sold, then it was within the 17th section.

Mr. Moulton: In what case was that, my Lord?

The Master of the Rolls: That is in *Berry v. Henderson*, which he refers to in *Piper's case*. He quotes and acts upon the decision of Mr. Justice Lush and Mr. Justice Hannen in *Berry v. Henderson*. There they sold prussic acid mixed with rose-water, and did not put "poison" on it. The point was argued, just what you are arguing, and they held against it. Then it was held he did not put the name of the person he sold it to.

Mr. Moulton: Mr. Justice Collins held what I am contending for, that the thing to be a poison must be a poisonous thing.

The Master of the Rolls: No, he held just the contrary. In *Piper's case*, do you mean?

Mr. Moulton: On page 693 he seems to me to hold so.

The Master of the Rolls: "Held that the prohibition of the Act against the sale of poisons by other than registered chemists was not confined to the sale of scheduled poisons in their simple state, or preparations of such poisons, but extended to the sale of a compound containing a scheduled poison as one of its ingredients." He held the contrary. We were told that to find in your favour we must over-rule the *Pharmaceutical Society v. Piper*.

Mr. Moulton: It is not necessary, my Lord, that your Lordships should go as far as that, because what I am contending for before your Lordships is this: I do not say you may not put other ingredients in a poison and yet bring it within the Act. What I do say is that if you put such ingredients, that the poison ceases to retain its qualities as a thing poisonous in its entirety.

The Master of the Rolls: Forgive me for saying that is a distinction which is too fine for me.

Lord Justice Kay: What it comes to, Mr. Moulton, is this: you may compound in one bottle with some other ingredients such a small quantity of poison as to be comparatively innocuous, certainly not enough to kill, and then you may sell a man a dozen bottles of that, and he may take them all and it would kill.

Mr. Moulton: That is perfectly true.

Lord Justice Kay: That is the way to destroy this Act of Parliament altogether.

Mr. Moulton: You could do it exactly in the same way with regard to a chemist; a man could commit suicide by going into a chemist's instead of going into a grocer's. Surely there is no great distinction.

The Master of the Rolls: As far as I understand your argument, if a poison was one of the ingredients of the compound they do not sell poison.

Mr. Moulton: My Lord, if all that is stated is that poison is present there, I submit it is not sufficient. Poison must be present there so as to make the thing itself poisonous.

The Master of the Rolls: If you say that you give yourself up in this case, because the County Court judge has held that the quantity is sufficient to kill a child. I suppose a child is a human being. He says it probably would kill a baby.

Mr. Moulton: I submit, my Lord, that would not be sufficient, otherwise you could buy nothing in wholesale quantities.

The Master of the Rolls: We do not give wholesale quantities to a baby, you know.

Mr. Moulton : Of course a medicine has to be given in doses, and the amount that there is in a dose is extremely small. Can it be said that if sold in bottles half the size it would make any difference?

The Master of the Rolls : Forgive me, I thought I was trying to follow your argument. Now you tell me I did not understand it; then I did not.

Mr. Moulton : I am very sorry, my Lord. I do not say the mere presence of other matters besides poisons takes it out.

The Master of the Rolls : I thought you did say so.

Mr. Moulton : I have submitted, my Lord, that the mere presence is not enough.

Lord Justice Kay : If I follow your argument, if a grocer took laudanum and diluted it so that in the bottle he sold there was not enough to kill anybody, even a child, he would not be infringing the Act of Parliament.

Mr. Moulton : My Lord, if very dilute I do not suppose he would be. For instance, he might use poppies.

The Master of the Rolls : Mr. Justice Collins says he was impressed with that for a time, but the impression broke down when he began to consider how on earth anybody could administer the Act if that were so.

Mr. Moulton : I think Mr. Justice Collins came to the conclusion in that case, that it was poisonous in its entirety, and the consequence was he thought the change was not sufficient.

The Master of the Rolls : If you admit that you are gone in this case, because it is held by the County Court judge as a matter of fact, and we cannot overrule his finding of fact—that in its entirety the article is poisonous.

Mr. Moulton : If that means the contents of the bottle, and if your Lordship thinks that is the issue before your Lordships, I cannot contend against that which is a question of fact.

The Master of the Rolls : I do not adopt that as the true reading of the Act, but I say if that is what you mean you are done.

Mr. Moulton : I submit there is so little poison compared to the bulk of the article, that the court may fairly say it is not even opium or a preparation of opium or of poppies. If it is not, then I submit it is not within the Act at all.

The Master of the Rolls : You are on the other side, Mr. Crump.

Mr. Crump : Yes, my Lord, the first argument by my friend Mr. Moulton is, that this is a patent medicine within the exemption of section 16. Now the legislation with regard to the Stamp Act my friend referred to, contains a reference to two species of medicine, I mean the 25th Geo. III., c. 79, section 14.

The Master of the Rolls : Was that argument used in the court below?

Mr. Crump : No, my Lord, it was not relied on.

Lord Justice Smith : Oh, yes; it was dealt with.

Mr. Crump : I do not think it was relied on or decided.

Mr. Bonyay : Oh, yes; it was relied on and decided.

Mr. Crump : Not in this case.

Lord Justice Smith : In Piper's case I mean.

Mr. Crump : Oh, yes, in Piper's case, but not in this case. As regards the intention of the Legislature in using the words "patent medicine," I refer to the fact that in the Act of George III. there is a distinct reference made in the same section of the Act (section 14) to articles exposed for sale under the authority of Letters Patent under the Great Seal, and also to what they referred to as sold "by any public notice, advertisement, or by written or printed papers or handbills, held out or recommended to the public by the makers, proprietors, or vendors thereof as

nostrums or proprietary medicines." Now, my Lord, that distinction is specific there, so that it was clearly before the Legislature when they passed the Pharmacy Act. Then, after the passing of the Pharmacy Act, which is the 31st and 32nd Vic., comes the Adulteration of Food and Drugs Act.

Lord Justice Smith : You have Letters Patent also mentioned in the 52nd George III.

Mr. Crump : I think it is so as well—c. 150, section 2.

Lord Justice Smith : Now what Act are you referring to?

Mr. Crump : The Pharmacy Act was the 31st and 32nd Vic., and then you have the Adulteration of Food and Drugs Act, 38 and 39 Vic., cap. 63. By section 6 the Act is not to apply where the drug or food is a proprietary medicine, or is the subject of a patent in force, and is supplied in the state required by the specification.

The Master of the Rolls : Where is that—in the Stamp Act?

Mr. Crump : No, my Lord, in the Food and Drugs Act.

Lord Justice Kay : It contrasts proprietary medicines with patent medicines.

Mr. Crump : Before the passing of the Pharmacy Act you had the Medicine Stamp Act, recognising medicines which were patented and medicines which were proprietary.

The Master of the Rolls : What is the Food and Drugs Act?

Lord Justice Kay : That is an analysts' Act.

Mr. Crump : It is for the prevention of the adulteration of food and drugs, and it says the Act is not to apply where the drug is a proprietary medicine, or is the subject of a patent in force.

The Master of the Rolls : They put them there into the same category, but use different terms.

Mr. Crump : The word is "or."

The Master of the Rolls : It is not to be applied to two things.

Mr. Crump : It is not to be applied to either.

The Master of the Rolls : That puts them in the same category.

Mr. Crump : It makes that Act cover both those classes of drugs. The observation upon this is that in the Medicine Stamp Acts of George III. you have a reference made to Letters Patent, and also to nostrums or proprietary medicines.

The Master of the Rolls : They are both stamped.

Mr. Crump : Yes, my Lord, one is under the Great Seal and the other is not; they are both to be stamped for revenue purposes.

The Master of the Rolls : So far as the Stamp Act is concerned they are both stamped.

Mr. Crump : That is for fiscal purposes they are both stamped.

The Master of the Rolls : There again it puts them both into the same class as stampable things.

Mr. Crump : Undoubtedly.

The Master of the Rolls : But it is not all proprietary medicines, it is only those specified.

Lord Justice Kay : There are schedules in that Act.

Mr. Crump : If they are offered as nostrums or proprietary medicines, or as specifics, or otherwise—that is the definition of them—for the prevention, cure, or relief of any such distemper.

Lord Justice Kay : What are you reading now, the Stamp Act?

Mr. Crump : Yes, my Lord.

Lord Justice Kay : Does it not give a list of medicines that must be stamped.

Mr. Crump : No, I think not.

The Master of the Rolls : It gives a list, but goes on, after the list of named things, to give this description of things.

Mr. Crump: The Act of 25 Geo. III., c. 79, I am using simply for the purpose of showing that the Legislature had in its mind two classes of medicines, nostrums and proprietary medicines, and medicines the authority for the sale of which is granted by Letters Patent under the Great Seal. Now you come to the Pharmacy Act, which gives protection only to patent medicines. The Sale of Food and Drugs Act, which comes a few years afterwards, gives an exemption in favour of proprietary medicines, and also patent medicines, and says the Act shall not extend to either. That clearly indicates, if anything can, that the Pharmacy Act was intended to extend only to patent medicines, which are patent medicines in this sense, that a specification has been furnished which would show the contents of the medicine; that specification was to show the contents of the medicine, and would be passed under the Great Seal. I hold in my hand a complete specification in that form, which passed the Great Seal so recently as 1892, and there you have a statement by the inventor of the ingredients in the patent medicine.

The Master of the Rolls: Let me see that.

Mr. Crump: I may say as a fact that the medicine contained a scheduled poison under the Pharmacy Act, and quite recently the patent has been revoked to that extent, excluding the scheduled poison; it has been revoked so far as it authorised laudanum in the compound—I am told it has been revoked entirely.

The Master of the Rolls: I see it is a new medicine or compound for the cure of cholera.

Mr. Crump: Yes, my Lord; I say, of course, that makes a very great distinction.

Lord Justice Kay: Mr. Justice Collins refers to that in Piper's case. He says that one of the main reasons for exempting patent medicines as distinct from others is because in the case of a patent medicine there is a specification to which all the world can refer to see what a medicine is made of.

The Master of the Rolls: On what ground has this been revoked? Are you sure it was because it has laudanum in it?

Mr. Crump: So I am instructed, my Lord.

The Master of the Rolls: Was it not because it was nonsense? Is not this sold by an old lady who says: "The object of this invention is to provide a combination of drugs for the treatment and cure of cholera. With this purpose in view I mix together so as to make up an 8 oz. bottle the following ingredients: Sal volatile, 2 oz.; peppermint, 2 oz.," the old ladies will like that I am sure, "spirits of camphor, 2 oz.; laudanum, 2 oz. The required dose to be taken in hot water sweetened with sugar, or if hot water is not readily available, cold may be used. The proportions may be varied with the quantity of liquid to be manufactured?" I should say this was put an end to because it was absolute nonsense.

Mr. Crump: Possibly on all grounds, my Lord. I am only telling you what my instructions are. The point has been taken in Piper's case and suggested here in argument, where you have a patent medicine you have the ingredients declared. It is under the Great Seal authorised, but in the case of proprietary medicines it would be monstrous that anything a man chooses to call a proprietary medicine might be sold.

The Master of the Rolls: They are secret.

Mr. Crump: They claim them to be. The ingredients are professedly unknown. All a man has to do is to pay so much to the Revenue, get stamps, put them on the label, that he is then entitled to sell it, however poisonous. I submit the argument is one which cannot possibly be supported. The plain words of the Act of Parliament, as was held in *Berry v. Henderson*, and the plain scope of the Act of Parliament according to Mr. Justice Lush, is to exclude all

preparations of scheduled poisons—all medicines which include a poison.

The Master of the Rolls: "Preparation" in medicine and chemistry is a peculiar word, is it not? Is not preparation making up the prescription?

Mr. Crump: No, my Lord, I think not; that might be compounding; a preparation is a medicine containing various ingredients, and the Society which I represent, under the powers given it by the Act of Parliament, has gone somewhat beyond the schedule in the last Pharmacy Act. They have included preparations of prussic acid, and amongst other things preparations of morphine, so that you have an extended classification of those things which are to be deemed poisons within the Act. What I submit is—it is the shortest possible contention—that when this Act says that an unregistered person shall not sell a poison as defined by the Act, he offends against the Act if he sells a medicine containing a scheduled poison. My Lord, that is a short statement of the Act, and in the case of *Berry v. Henderson* the point as to ingredients was dealt with by Mr. Justice Lush. He says this at page 303 of the five Law Reports, Queen's Bench; he is dealing with the exemption in section 17—"The first part of the section, the enacting part, applies to the sale of poisons, and amongst the poisons enumerated is prussic acid. I observe that the schedule seems to treat all the poisons as sold in their simple state." That has been the contention all through this case, that the poison must be sold in its simple state, or that it must be a poison *per se*. "I observe that the schedule seems to treat all poisons as sold in their simple state, or in some form of preparation alone; and it does not appear to contemplate any of them being mixed up with any other ingredients—it applies to them pure and simple."

The Master of the Rolls: We need not trouble you any more. Do you wish to comment on what Mr. Crump has said, Mr. Bonsey.

Mr. Bonsey: There is only one point I wish to make with regard to what Lord Justice Kay said just now, as to the schedule in the Medicine Stamp Act. Proprietary medicines are not confined to those scheduled in the Act; but it does go on to say in the Act of 52 George III., "and all other medicines," and so on, prescribed for any diseases. I do not know that I wish to add anything to what I said before.

Judgment.

The Master of the Rolls: I think this appeal must be dismissed. It is an appeal against the decision of the Divisional Court, which determined an appeal from the County Court judge. With regard to any fact in the case, we are not authorised to depart from the finding of fact found by the County Court judge. There is no appeal against any finding of fact. Then we must take it, therefore, that in the article if you like, or the bottle or phial which was sold by the defendant in this case, there was one of the poisons named in the schedule to the Act of 1868. We do not know what all the other ingredients in this bottle were, but we know that one of the ingredients was one of the poisons named. We know that there were several other ingredients, but I think we do not know what they were, or the quantities of them. The court has held that the defendant has made himself liable to the penalty named in the Act, by selling this phial of medicine, it being admitted that the thing sold was a medicine; and he was held liable to the penalty because he was not one of the persons who are entitled to sell such a medicine; he was a grocer, he was not a pharmaceutical chemist, he was not a chemist at all. Now arguments have been addressed to us on the two points which we have to decide. It is said that he did not sell the poison mentioned in the schedule. If that

is not prevented by having mixed with it other ingredients, it is clear that he sold poison; he sold a particular part of this compound, which was poison, and if he sold poison, then he is liable to the penalty, not being a person entitled to sell poison. Now, the argument is this, you have mixed this poison with other ingredients; you have not done anything to it which alters its chemical nature, you have left it still with its chemical nature in it, but have mixed it with other things. Does that in ordinary language make it not poison? Does poison put into a bottle of wine cease to be a poison? Or does poison put into a cup of tea cease to be poison? The ordinary way by which in the old days people were poisoned, from cardinals downwards, was to put something into what they were going to drink. That something was poison, and it was never said, until we had skilled advocates to say it, that because the people who wanted to poison a cardinal put poison in his wine, therefore it was not poison. Wine could not poison him. Then what did poison him? Why, the poison that was in the wine. So it is clear, —unless the Act of Parliament had said that you are to alter the nature of things—that when poison is put into a medicine, and a person sells the medicine, he sells the poison that is in it. Then he has sold poison. There is nothing in the Act of Parliament that I can see, reading it in its ordinary language, which says that you may sell a poison mixed with other things, though you may not sell poison by itself. There is nothing in the Act which says that. This argument was used—as Mr. Justice Collins says—with great skill and great power, and I do not doubt it from what we have heard to-day, for we have heard the same counsel who argued that case before him. But Mr. Justice Collins, for reasons which he gives, comes to the conclusion that I have come to, viz., that you sell poison, if you sell it without its nature being altered, although you do sell it mixed up with other things. I cannot see any answer to that view. I cannot appreciate the sufficiency of the argument against it, and, therefore, I think that this person did sell poison. Then we are, of course, met with the infinitesimal argument. But the meaning of the word infinitesimal when used in a court of law is that if a thing is so small that the court will treat it as such; what the court means by infinitesimal is that we treat it as not existing at all—*de minimis* if you talk of it in Latin, infinitesimal if you talk of it in English; but *de minimis* in Latin, when construed into English, means so infinitesimally small that the court will not take any notice of it. Therefore, this person did sell the poison named in the schedule A, and in the second part of the schedule. Then it is said: Ah, but he is exempt by reason of this, that he sold a patent medicine! Both the learned counsel who argued this have been telling us a great deal about the knowledge of patent medicines in the trade or amongst other people—I do not know whether they mean the people who swallow the medicines or the people who sell them—they say that all proprietary medicines, the vulgar name of which is “quack” medicines, are known by the name of patent medicines. In the first place I do not accept the statement of fact. I doubt it extremely. But in the second place it seems to me wholly immaterial. We have to construe an Act of Parliament. When we find that Act of Parliament, or Acts of Parliament which have been dealing with this very subject matter, distinguishing between proprietary medicines, secret medicines, and patent medicines, and when you come to this Pharmacy Act and find that it has in terms dealt with only one of those phraseologies, viz., patent medicines, it is clear to my mind that, construing this Act of Parliament according to ordinary canons and construction, you must say that it applies only to patent medicines, using that term

in the sense of medicines which have procured a patent under the Great Seal. On both points I agree entirely with Mr. Justice Collins' judgment in the Pharmaceutical Society v. Piper, which is, as to one of these points, founded upon *Berry v. Henderson*, decided by Mr. Justice Lush and Mr. Justice Hannen. We must over-rule both those cases in order to allow this appeal. We could, of course, over-rule them, but I am of opinion they are both right. We cannot over-rule them, and, therefore, this appeal must be dismissed.

Lord Justice Kay: The Pharmaceutical Society in this case had brought an action against the defendant, who is not a chemist—not one of the persons authorised to sell poisons under the 31 and 32 Vic. c. 121—and the Society had brought the action for the penalty which is imposed by the 15th section of that Act in these words: “any person selling poison otherwise than is herein provided, shall,” &c., “be liable to a penalty,” and so on. The facts of the case, so far as material, are these. The thing sold is what I suppose would commonly be called a “quack” medicine—balsam of aniseed. What it is compounded of we are not told; but we are told that each bottle contains one tenth of a grain of morphine, and what the County Court judge said in his finding on the facts, which is conclusive upon us, was this:

“It was said, indeed, that it might be fatal to an adult suffering from certain diseases, but except under those special conditions I do not think that the evidence established that the contents of the bottle if taken at once would ordinarily be fatal or even injurious to adult life. In the case of children, however, it was stated in the evidence given on behalf of the plaintiff, that if the whole contents of the bottle were taken at once by a child in ordinary health it would certainly be injurious and might be fatal, and to an infant probably fatal. This evidence was not contradicted or seriously impugned by the witnesses called for the defence, and in my opinion I ought to accept it as true.” (See *Pharm. Journ.*, liii., 769.)

Therefore, this is not a case in which the maxim *de minimis* applies at all. I can quite understand that, although a case might otherwise be within the Act, if the proportion of one of the poisons mentioned in the schedule were so exceedingly small as to be perfectly innocuous or comparatively innocuous if the whole bottle were taken, then the maxim *de minimis non curat lex* might possibly apply to an action of this kind; but this is not a case of that kind. Now the first argument was, this is not a sale of morphine, because it is only a sale of a composition which contains morphine. The argument stated in that way seems almost to answer itself. But when one looks at the Act of Parliament which we have to construe, I think it is plain that an argument of that kind cannot be maintained. The Act of Parliament provides that it shall be unlawful for any person to sell poison or to keep open shop for the retailing, dispensing, or compounding of poisons, unless—I am reading it shortly—he be a pharmaceutical chemist or a chemist and druggist within the meaning of the Act, and registered under the Act, and conforms to the regulations in the Act. Then section 2 says, “the several articles named or described in the schedule (A) shall be deemed to be poisons within the meaning of this Act,” and certain other articles may afterwards be declared by the Council of the Pharmaceutical Society analogous to those mentioned in the Act. Now in the schedule to this Act is named, amongst other things, “opium, and all preparations of opium or poppies.” Therefore, anybody who sells opium or any preparation of opium or poppies, is selling that which by this Act no one can sell, without incurring a penalty, except a pharmaceutical chemist or a chemist and

druggist within the meaning of the Act. The argument that because this is compounded with something else, therefore it may be sold, really may be reduced to complete absurdity by supposing the composition was one or two of the articles comprised in this schedule. You cannot say that because a prohibited poison is compounded with another prohibited poison, that therefore it may be sold, or that you are not selling either of the two poisons. But even without taking so extreme a case as that, can it possibly be the meaning of this Act that you may sell any one of these prohibited poisons provided you mix it up with other ingredients and sell it in bottles containing such quantities that if the whole bottle was taken it would poison a man or a child? You would utterly destroy the object and purpose of this Act if you came to any such conclusion. Nothing in the world would be easier than to evade this Act if you could say that although you may not sell the particular articles mentioned in the schedule, anyone may sell them if he mixes something else with them. It seems to me quite impossible to accept that. If the mixture does contain the article in a considerable quantity—such a quantity as to be deleterious if the whole were taken—then it seems to me that you are infringing not only the letter, but the spirit of this Act of Parliament, if the person who sells that is not a qualified person within the meaning of the Act. Then the other argument was that it was excepted by section 16, because it was a patent medicine. Section 16 provides that “nothing hereinbefore contained”—that is, nothing in the sections 1 and 2, which I have read amongst others—“shall extend to or interfere with,” amongst other things, “the making or dealing in patent medicines,” and so on. It was said that in ordinary parlance all proprietary medicines are classed under the head patent medicines. But is that the meaning in this Act of Parliament? The best way to construe this Act of Parliament is to see how the Legislature has dealt with other medicines in other Acts of Parliament, and when we look through other Acts of Parliament, we find a most clear distinction always maintained. Although proprietary and patent medicines are classed together for certain purposes, the language of certain Acts of Parliament has been read to us, including this Act of 52 Geo. III., which makes in terms a distinction between patent medicines and those medicines which are not patented. Take 52 Geo. III., an Act which imposes a stamp duty on certain medicines which are mentioned in the schedule, “and also all other medicines, made, prepared, uttered, vended, or exposed to sale by any person or persons whatsoever, wherein the person making, preparing, uttering, or exposing to sale the same, hath or claims to have any occult secret or art for the making or preparing the same, or hath or claims to have any exclusive right or title to the making or preparing the same,”—so that this shows them to be dealt with as a separate class,—“or which have at any time heretofore been, now are, or shall hereafter be prepared, uttered, vended, or exposed to sale under the authority of any Letters Patent under the Great Seal.” Now, I entirely accept what Mr. Justice Collins said in the Piper case. The reasons for that exemption seem to me very clear indeed. Where the medicine is, properly speaking, a patent medicine, that is to say, where the exclusive right to make or sell it has been granted to somebody under Letters Patent under the Great Seal, the condition of the patent always is that a specification is lodged in the Patent Office describing the whole of the ingredients and the process of manufacture. Without that no patent could be obtained—without that any patent would be void. Therefore, when people buy a patent medicine they have the means of ascertaining what ingredients are contained in that patent medicine, and that is one reason, no doubt, for the exemption.

Another is this—if before this Act of Parliament which we have to construe a patent of that kind had been granted, it would give to the patentee the exclusive right of making and selling the patented article, and it would have been rather hard, by this Act of Parliament, to take away from him that which he had been exercising as a right under the authority of the Great Seal, and to prevent him from further making or selling, if he were not an authorised person under the Act. For these reasons I think it is plain that in section 16 the words “patent medicine” mean that which they express *primâ facie*, medicine the maker or owner of which has obtained Letters Patent for it; the term does not extend, and is not intended to extend, to mere proprietary medicines, or to include a medicine like this, for which the owner or maker has not obtained any patent whatever. On these grounds I think the decision of the court is perfectly right, and that this appeal fails.

Lord Justice Smith: This is a proceeding by the Pharmaceutical Society of Great Britain against a grocer, Mr. Richard Armson, and the proceedings are taken under section 15 of the Pharmacy Act of 1868, Mr. Armson—who is a grocer—having sold poison, not being a chemist, or a person entitled under that Act to sell poisons. The first question which arises is whether or not Mr. Armson has sold poison within the meaning of the Act, and secondly—because it seems to me the other point is secondary—whether or not this is a patent medicine within section 16 of the Act. Now, I understand this case is brought for the purpose of overruling, if possible, three cases which have been decided heretofore, the case of *Berry v Henderson*, which was decided by Mr. Justice Lush and Mr. Justice Hannen, the case of the *Pharmaceutical Society v Piper*, which was decided by Mr. Justice Collins and Mr. Justice Lawrence, and also the last case which was decided, which was called *Delve's case*. Now the first point is, without discussing those cases, to ascertain, if we can, what is the meaning of the Act itself. Without going into the authorities which have been cited, speaking for myself, I must say I cannot see—I was going to say any difficulty—but I will say much difficulty in construing this Act. The general object of the Act was to have poisons dispensed, or made up, if you like, by duly qualified persons. That is the meaning of the Act, and I should have said, the general object of the Act was to prevent grocers selling poisons. That is the meaning of the Act—whether it is within the Act or not I will discuss in a moment. What does the Act say: “From and after the 31st day of December, 1868, it shall be unlawful for any person to sell” poison. That is clear, is it not? After that date it shall be unlawful for any person to sell poison, excepting he be one of a privileged class, which I will call chemists and druggists, or anything else you like to call them—chemists, if you like. Then it goes on, and in section 2 it says this (in order to point out what shall be poisons which can be only sold and dispensed by chemists): “The several articles named or described in the schedule (A) shall be deemed to be poisons.” If you read those two together the meaning of those two sections is that nobody except a chemist shall sell the poisons mentioned in the schedule. That is a short purview of the Act. I am leaving out the other parts of this section, which are immaterial to the point in hand. Now I come to the schedule. What is it that they are not to sell? The articles are catalogued in the schedule. First there is part 1, in which are the more virulent sort of poisons, beginning with arsenic and prussic acid, and then those which are not such virulent poisons in part 2, and they finish up with opium and all preparations of opium or poppies. Well, I ask myself who are to sell these poisons mentioned in that schedule, and my answer is chemists. That is

the meaning, as I say, of the Act, and if the Act stopped there I do not see how it could be said otherwise than that the County Court judge and the Divisional Court were right in saying that Mr. Armonson, in the circumstances of this case, had sold a poison within the meaning of the Act, because it is found that in this Powell's balsam of aniseed there is a poison which is one of the poisons mentioned in the schedule. That is beyond all question. It is found at any rate that it is not *de minimis*—although I do not think this is material for the decision we are giving to-day—but that it is in such a substantial quantity that if a child took it it would probably injure him. I had better read it:

"In the case of children, however, it was stated in the evidence given on behalf of the plaintiff that if the whole contents of the bottle were taken at once by a child in ordinary health it would certainly be injurious and might be fatal, and to an infant probably fatal." (See *Pharm. Journ.*, liii., 769.)

Therefore, there is a poison in this bottle, which if taken by a child or an infant, would certainly or probably do damage to the taker. Now, I ask myself, has or has not this defendant sold a poison which is mentioned in that Act? I can only answer that question by saying he certainly has. Then it is said, "Oh, but he did not sell the poison *per se*, but he sold the poison with something else!" Well, supposing he did. I put the case during the argument, and I will put it again. I will take chloroform, because it is a simple case. Supposing a man filled up a bottle half full of chloroform, and filled the other half with water and sold it—I put it to Mr. Moulton two or three times—do you mean to say he does not sell chloroform? Of course he does—he sells chloroform and water. He none the less sells chloroform, and the prohibition, as I read this Act, is that he is not to sell chloroform unless he be a chemist. Therefore, it seems to me there is a direct prohibition in this Act against other than legalised persons selling poisons; the present defendant has sold a poison, and he is therefore within the meshes of this Statute. But then it is said by Mr. Moulton: "No, although you may get him into the meshes in this way, he is out of it by reason of section 16 of the Act, because section 16 provides that nothing hereinbefore—that is, in none of the sections prior to section 16—shall extend to the case of 'making or dealing in patent medicines,' and he says this Powell's balsam of aniseed is a patent medicine. Well, the first thing one asks oneself is, where is the patent? The only answer to that is, there is no patent at all. How then do you call it a patent medicine? "Oh, it is said it is a proprietary medicine, and, therefore, we ought to read this section 16, which exempts patent medicines and patent medicines only, as exempting patent medicines and proprietary medicines!" Well, without any authority in the Statute, I certainly should not have read section 16 in that way myself, because when the purview of this Act is to bring into it all the poisons mentioned in it, and secondly, all medicines made out of those poisons, exempting a few cases, the exemption must of course be read in the manner which the Queen's English dictates; and when the legislation which has taken place before and since this Act of 1868, which we are dealing with, is looked at, it is abundantly clear that for some express purpose the limitation and the exception was patent medicines and only patent medicines, because if you begin with the Statute of 25 Geo. III., sec. 4, and then take the next Act of 1852, Geo. III., c. 150, sec. 2, both prior to this Act of 1868, there is a distinction between a patented medicine and what I should call a proprietary medicine, that is, a medicine which is compounded of secret nostrums. When you come to the Act of 1868, the sole exception made relates to patent

medicines. Then a few years afterwards—seven years—another Act is passed, in which the exception is made where the food or drug is a proprietary medicine, which this Powell's balsam of aniseed is, or is the subject of a patent in force. This clearly shows that there is a distinction to be drawn between a proprietary medicine and a patent medicine. Mr. Moulton, whose knowledge on these subjects we all know to be very large, doubted whether there was such a thing as a patent medicine. Well, all I can say is, that a specification was handed up in which it was shown that Mrs. Mary Rendle, of 33, Warwick Road, did take out a patent for a medicine in 1892. So that a patent for a medicine can succeed, and when in the year 1892 the Attorney-General will pass it, and grant his fiat, all I can say is that it is proved. In my judgment, this case has been brought within the Act. Mr. Armonson cannot get out as being within the exemption in section 16, and this appeal must be dismissed.

Mr. Grey: With costs, my Lord.

Lord Justice Kay: Yes.

ACTION AGAINST AN UNREGISTERED ASSISTANT.

On Wednesday at the County Court of St. Helens, Lancashire, before his Honour Judge Shand, an action was brought by the Council of the Pharmaceutical Society of Great Britain against John Ernest Edington, assistant at the World's Drug Stores, 135, Westfield Street, St. Helens, to recover £5, the penalty for a breach of the Pharmacy Act, 1868. Mr. T. R. Grey, barrister, instructed by Messrs. Flux, Thompson, and Flux, of London, appeared on behalf of the Society, and Mr. H. L. Riley, solicitor, defended.

Mr. Grey, in opening the case, said this was an action for a penalty for the sale of poison contrary to the Pharmacy Act, 1868. The defendant was the unregistered assistant to Mr. Harrison, a registered chemist who carried on business at 135, Westfield Street, St. Helens, and on May 31 he sold a bottle of Dr. Collis Browne's chlorodyne that would be proved before his Honour to contain about three-quarters or more of a grain of morphine, which was a scheduled poison.

Evidence having been given to prove the sale of the chlorodyne and the presence of morphine in it,

Mr. Riley then addressed the court, and said that his defence would be limited to the question whether or not defendant did break the law in the course of his selling the chlorodyne. They raised no question as to whether it was or was not a poisonous compound. He would show his Honour that there was on the premises a registered chemist to whom the premises belonged, and that the assistant took the bottle from the case and asked his master, who was in an inner room, if he would oblige a neighbour by letting him have it. He would thus prove that the assistant was acting under the personal superintendence of a qualified employer.

Evidence bearing out the statement of defendant's solicitor was then given, after which

His Honour said it was perfectly right that the Pharmaceutical Society should take proceedings in all cases, even of doubt, but he was not going to convict a man—for it was practically a conviction—unless it was abundantly clear that the Act had been transgressed. If there was a doubt in his mind he thought he ought not to convict. It was for the Society to prove that the sale was not under Mr. Harrison's supervision, and they had not done it. It was practically a criminal case, and it was perfectly right that anybody who transgressed the Act should be punished and punished severely, but he must be fully satisfied that they had done wrong before they were punished. He therefore gave judgment for defendant with costs.

POISONING CASES AND INQUESTS.

CHILD POISONED BY CARBOLIC ACID.

An inquest was held on Tuesday, July 10, at Cloy, near Overton, Flintshire, by Mr. E. J. Pay, coroner, concerning the death of a child, aged three and a half years, daughter of a labourer named Powell. Some carbolic acid, which had been used for disinfecting purposes, was left on the kitchen dresser, and deceased drank of it. She was given an emetic, but died about twenty minutes afterwards. The Coroner commented strongly on the carelessness of the persons responsible, and a verdict of "Accidentally poisoned" was returned.—*Liverpool Post*.

SUICIDE BY CARBOLIC ACID.

On Wednesday, July 11, before Mr. Sampson, coroner, an inquest was held on the body of Mabel Sybil Macallister, 16 years of age, a domestic servant, who was in service in Bedford Street, Liverpool. The evidence was to the effect that the girl, who had been in good health until about five weeks back, became much depressed after the death of her father. On Monday last she was found lying in the kitchen apparently very ill. A doctor was sent for, but on his arrival the girl was dead. The medical evidence was to the effect that death was due to carbolic acid poisoning. When the girl purchased the carbolic acid she said that it was to be used in the drains. The coroner commented upon the fact that carbolic acid could so easily be purchased. Scarcely a week passed without there being an inquiry into death arising from poisoning by carbolic acid, and he trusted that there would soon be legislation with a view to making it more difficult for would-be suicides to obtain such stuff. The jury returned a verdict of "Suicide whilst temporarily insane," and expressed their agreement with the coroner's remarks as to the necessity of curtailing the facilities for obtaining poison.—*Liverpool Mercury*.

EXPLOSION OF A SILVERING (?) MIXTURE.

On Tuesday, July 10, Sanderson Drury, a youth of 18, who lives at 34, Dove Street, Saltair, was nearly blinded by the explosion of a mixture of nitric acid and mercury. Drury had a brass watch-chain, and he was anxious to turn it into silver. He learnt the secret how to do this from one of the itinerant lecturers who attend Shipley Market, and on Tuesday he paid a visit to a chemist and purchased a mixture of nitric acid and mercury, which was supplied to him in a bottle. He had not gone far from the shop when the bottle was blown to pieces, the glass and the acid striking Drury in the face. At first it was thought by bystanders that the youth was killed. They conveyed him to the hospital, where Dr. Foster found that there were serious injuries to the eyes and face. The usual remedies were applied, and the patient is going on as well as can be expected, though he has not yet regained his eyesight.—*Yorkshire Evening Post*.

SUICIDE BY ARSENIC POISONING.

On Wednesday, July 11, John Duncan, 62, shoemaker, living in Dallfield Walk, Dundee, committed suicide by taking white arsenic. Duncan was found lying on his bed, and on being asked whether he was unwell he said, "I have taken poison." Later, he became unconscious and frothed at the mouth. Medical aid was at once summoned, and Dr. Young, who attended, ordered Duncan's removal to the Infirmary. On searching the house Mrs. Duncan discovered in the fireplace a piece of white paper on which was marked "White arsenic—poison." At the Infirmary every means was taken to restore Duncan, but he died about ten minutes after admission, never having regained consciousness. Death was due to swallowing a large quantity of white arsenic. It is

believed that Duncan had purchased the poison from a drug store, stating that it was for use in his occupation.—*Dundee Advertiser*.

Reviews and Notices of Books.

THE NATURAL HISTORY OF PLANTS. By ANTON KERNER VON MARILAU and F. W. OLIVER, M.A., D.Sc. Part 3. Pp. 225 to 336, with coloured plate. 2s. 6d. nett. London: Blackie and Son, Limited.

The nature and methods of absorption, symbiosis, action of plants on the soil, transpiration, protective arrangements of the epidermis, and kindred subjects are dealt with in this part of the work. The beautiful coloured plate represents tropical epiphytes in Ceylon—*Saccolobium guttatum*, *Dendrobium nobilis*, and *Phajus wallichii*.

BEGINNER'S GUIDE TO PHOTOGRAPHY. By a Fellow of the Chemical Society. Pp. 119. 6d. London: Perken, Son, and Rayment, 99, Hatton Garden.

This little book deals with the choice of apparatus, description of lenses, and the various operations involved in preparing and printing from photographic negatives. In addition, there are chapters on chemicals in common use in the art, detective cameras, stereoscopic photography, lantern pictures, enlargements, photo-micrography, weights and measures, and photo-mechanical printing processes. No pretence is made to give exhaustive descriptions of the various processes referred to, but in the brief space available enough is said to enable a beginner to form a fair idea of the scope of photography, and to readily overcome the elementary difficulties that lie in his path.

Notes and Queries.

BLAUD'S PILLS.

A simplified formula for these pills, said to yield a more permanent product than the original, is given by J. W. England, as follows:—"Potassium carbonate, one-third grain, potassium sulphate, two grains, and mass of iron carbonate, three grains, in each pill. Little or no excipient is required. The pills flatten somewhat on keeping, and are best dispensed in gelatin capsules. They are small in size, and do not become hard and reddish-brown on fracture, as do those made by the old formula" (*Am. Journ. Pharm.*) The "mass of ferrous carbonate," U.S.P., is prepared by dissolving ferrous sulphate 100 Gm., in boiling distilled water 200 C.c., and adding syrup, 20 C.c. (Syrupus, U.S.P., contains 850 Gm. of sugar in 1000 C.c.). Sodium carbonate 100 Gm. is also dissolved in boiling distilled water, 200 C.c., and, when both solutions are cold, the first is gradually added to the second, in a bottle of about 500 C.c. capacity. When gas no longer escapes, distilled water is added to fill the bottle, which is then corked and set aside for the ferrous carbonate to deposit. After decantation, the precipitate is thoroughly washed with a mixture of syrup (1 vol.) and distilled water (19 vols.); then mixed with clarified honey, 38 Gm., and sugar, 25 Gm.; and finally evaporated on a water-bath until reduced to 100 Gm.

OINTMENT OF AMMONIATED MERCURY.

This ointment J. W. England prefers to make by finely powdering the ammoniated mercury, then beating it into a smooth paste with one-fourth its weight of glycerin, and preparing the ointment from the mixture as required. Entire freedom from "grit" is said to be obtained. Glycerin is also recommended for rendering veratrine smooth or making extract of belladonna soft, prior to making ointments from them (*Am. Journ. Pharm.*).

MEDICATED WATERS.

In the new U.S.P. these are directed to be made by using precipitated calcium phosphate as a distributing medium for the essential oils. J. W. England urges the advisability of invariably adding the whole of the water to be used to the mixed oil and phosphate, before filtering, as a stronger solution is thus obtained. If hot, boiled water be used a further advantage is obtained, for, in addition to obtaining a maximum solution of the oil, there is an increased permanency of the water. The loss of oil by volatilisation, in this case, is said to be more apparent than real, being insignificant in comparison with the greatly increased amount brought into solution (*Am. Journ. Pharm.*).

CINERARIA MARITIMA.

"Can you give me any information regarding the therapeutics of *Cineraria maritima* and its synonyms?"
—DAVID GORDON.

Cineraria maritima was recommended for soft lenticular cataract by Dr. R. Mercer, of the Port of Spain, Trinidad. His letter, forwarded by the Director of Kew Gardens, was published in the *Pharm. Journ.* ([3], viii., p. 985). There are two plants which have borne the above name; the one which is apparently intended being the *Senecio cineraria* of Linnaeus. The other is the *Senecio gibbosus* of De Candolle. The latter differs from Linnaeus' plant chiefly in the nearly sessile leaves and glabrous involucre. It is found in Sicily and Calabria; *Senecio cineraria* occurs generally on the shores of the Mediterranean, from Spain to Greece and Egypt.

TEREBENE EMULSIONS.

Terebene should be emulsified, according to C. B. Lowe, by the addition of 1 drachm of powdered gum arabic for each fluid drachm. The emulsion is difficult to make, on account of the great tendency of the terebene to separate, and the method recommended is, first, to carefully mix the gum with the water, and then slowly and cautiously add the terebene (*Am. Journ. Pharm.*).

FORMALIN IN PHOTOGRAPHY.

On half immersing a finished negative in 40 per cent. formalin solution, Dr. F. D. Skeel found that the portion immersed became slightly opalescent, but cleared perfectly after being a short time in cold water. The portion of the film so acted upon did not swell in the water to the same extent as the other half. Subsequent experiments with soft gelatin in sheets showed that, after treatment with formalin, it became insoluble in boiling water, while remaining transparent. It was also noticed, however, that on softening the gelatin in cold water before immersing in the formalin solution it remained partially soluble in boiling water (*Photography*).

Correspondence.

NOTES AND QUERIES.

Sir,—I sincerely hope that your readers will not lose sight of the fact that at the last meeting of the Executive of the North British Branch of the Pharmaceutical Society Mr. Lunan gave notice that he intended to move a resolution recommending the Council to consider the desirability of enlarging the Journal, and expressed an opinion that it could be made much more popular and valuable by the introduction of dispensing memoranda and notes and queries than it is at present as a simple record of transactions. It may have been simply a coincidence, but in the very number in which the report of the above meeting appeared, a column of "Notes and Queries" was included for, I believe, the first time in recent years, a departure promising to give excellent results, judging by the foretaste we have had. That there are many interesting and knotty points arising daily at dispensing counters all over the kingdom which it would be most profitable to your readers to have threshed out in the Journal no one will for a moment deny, but there is always a large amount of diffidence to be overcome before the persons under whose notice these difficulties fall can be persuaded to mention them at meetings of a pharmaceutical character or write to the Journal for information. No doubt this is due to a vague fear that their query may be considered as one of those things which that encyclopaedia of more or less useful knowledge "every school-boy" is supposed to know, and that they may be consequently "sat upon" for their pains. Such a fear need not trouble them any longer when a column is reserved for their use, and it only remains for them to make such use of it as will render it as valuable to your readers as I find the column headed "The Month," which I consider of itself well worth the annual subscription.

Liverpool.

H. WYATT, JUN.

PROTECTING THE TITLE.

Sir,—Referring to Mr. Ellinor's letter in your issue of June 23, I am informed that the Pharmaceutical Council refuses to move in the matter because eminent counsel are of opinion that the attempt would not be successful. I do not think that is satisfactory. It is the duty of the Council to remove all doubt about the title, as it was its duty to remove doubt about poisonous proprietary medicines. Was it counsel's opinion that prevented this being done until outside pressure was brought to bear?

3, Market Place, Derby.

JOHN A. COPE.

EDUCATION AND EXAMINATION.

Sir,—The topic of "examinations" has again cropped up. A mother went to see how her son was getting on at school, and the master told her "Pretty well, but he wants a capacity." "Oh! we will soon get him one; how much is it?" "I am afraid that the school has a great deal to answer for if a boy does not get on, for generally if the school fees are paid, and he is not guilty of misconduct, not much attention is given to his want of success. In every school there are pupils who succeed very well, some pretty well, and others not at all. In one of my addresses to the North Kensington Chemists' Association, I pointed out that chemists do not learn the lessons they ought from the subjects they have studied. Botany teaches us unity and order, and chemistry purity and compatibility. Now, as we know that all boys have not a proper capacity, and chemists buy "elect" drugs, so they should have apprentices "elect," not "sorts" for it is worse than useless and even cruel to bring unsuitable candidates into pharmacy. Therefore the sooner the mistake is found out the better, and more so as pharmacy is becoming more complex every day. The Preliminary must be strengthened and passed before apprenticeship, and a proper curriculum established. That is what is generally conceded, and it is time it was so established, and only those taken who have passed the examination. No one ought to (I was going to say be allowed) take apprentices for cheap labour. They ought to be able and willing to teach them, and the nature of the duties must be entirely changed, for while I would not object to a very short spell of the "rudiments," duties devolving on the errand boy should be

speedily turned over to him, and the pupil ought at once to commence those studies without which he cannot understand anything he is doing. Whether making preparations or dispensing prescriptions, the principles governing this work ought to be explained, and proper time given him to study botany, chemistry, and materia medica, with encouragement and assistance, nay, more, insistence that he should do so, not after the shop is shut, when he is tired and fagged out, but as part of the day's work, and with reasonable time allowed for recreation. Sometimes the lad will not learn, he hates all trouble, and often passes his time without any study. There is a general idea that an apprentice should select one of the "provincial centres" with a college. This, of course, is the best, but there ought to be plenty of men in smaller places who should be able to ground their apprentices in all subjects, often having more room and leisure, and in return find it a "profitable extra." I quite agree with the late Henry Deane, the chemist ought to get a good fee for his trouble, and it would ensure his pupil having the necessary capital to pay for his education, without calling on the Pharmaceutical Society to clothe, educate, and examine him for nothing, beside ensuring his success in business afterwards.

Reading.

HENRY LONG.

WEIGHTS AND MEASURES.

Sir,—Relative to the late discussion on the decimal system, may I say that I adopted some time ago a simple system, which has saved us probably many awkward mistakes—i.e., to drop the use of the signs g and z and the corresponding terms altogether, and copy all entries in prescription or receipt books in simple terms of grains and ounces; and, in addition, use instead of the scruple, half-drachm, drachm, etc., weights, for dispensing and making preparations, weights from $\frac{1}{4}$ grain (I use the angular grain weight) to 10, 20, 30, 50, 100, 500, 1000 grain weights—a weight of 60 and one of 120 grains are also useful. We are all of us familiar with the dangerous similarity there is in some prescriptions between the signs, as well as the illegibility of the Roman numerals, but a quantity written, say, gr. 150, instead of z lss., could scarcely be mistaken, even when written hastily. As for the indications of quantities, by using the signs 3j 3iij 3j gr. 2—well, they are neither more nor less than a relic of mediæval darkness. My apology for mentioning such a trifling matter must be that of having met so many chemists who have appreciated the scientific simplicity of the method I suggest. It is devoutly to be hoped that the forthcoming edition of the Pharmacopœia may have the metric system introduced, at any rate as an alternative system. It is intolerable that Great Britain alone should be without a scientific system for estimating quantities when all the civilised world has adopted one. I am sincerely sorry for those members of our craft who—having allowed themselves to get out of touch with modern scientific refinements—are unable to grasp this simplest of systems, which even our school children are familiar with. But in spite of these persons, we who have used the metric system and enjoyed its benefits ought not to be deprived thereof any longer.

Blackpool.

C. H. TURVER.

SUGAR IN URINE.

Sir,—That Sir George Johnson has rendered a signal service to medicine by his very able paper, "On Some Common Sources of Error in Testing for Sugar in Urine," no one who has ever been engaged in its clinical examination can gainsay, and pharmacists should be grateful to you for giving such a bold advertisement in your pages. It is not altogether satisfactory that medical men deep in the mysteries of a case, and sometimes fogged by obscure symptoms, should play the part of animal chemists too—in fact, it seems hardly fair. Sir George Johnson's paper, if published thirty years ago, would have lightened my anxiety on many occasions—for without more light it is rather heroic for a chemist to tell a medical man that urine of, say, specific gravity 1.035 contains no sugar, and he could only do it by relegating the copper test to a "back seat," and carefully using them all, especially beginning with Moore's liquor potassæ test. I was immensely amused at Sir George Johnson's lead fallacy in that otherwise faithful preliminary test, the doc-

tor must have been rather weak in shades of colours. It is indeed an anxious and responsible task, I know of none more so, excepting, perhaps, the phosphatic deposits when existing in hysteria, portending something much more serious later on. Declare for sugar and what happens? Not an alteration in the dynamics of medicine, for there is no life in the materials the pharmaceutical chemist compounds. The source of life is disturbed, the meals which build up the complete organism are seriously upset, digestion in its widest sense is like a ship rigged with jury masts, trusting to fair weather. The process of digestion loses some of its sweetest musical notes, and the harmonious action of the spine sometimes impaired. The chemical and microscopical study of urine is in comparative infancy, there is much to be done; but may I give one word of warning? Urea is a very complex substance, its capacity for forming under favourable circumstances other nitrogenised substances is great. That eminent physicist, the late Professor Redwood, said (I am repeating from a bad memory): "If you have a liquid, say, of three or four pints, containing several salts, on evaporating it down by heat, do not be too sure the salts you separate existed in the solution in the manner in which you finally arrange them—for by the process of boiling a constant play and interchange of the elements is going on, and your final result will not even give you a clue to them." In searching for sugar, for many years I have, where its presence has been suspected, not taken the specific gravity first, but have preferred to use the chemical tests; for I have found distinct evidence of sugar in urine, specific gravity 1.010-20, when it has been absent in specific gravity 1.040, and considering the abnormal quantities of fluid often passed in diabetes, is it surprising?

Enfield.

GEORGE MEE.

Answers to Correspondents, etc.

Robert Crofts.—Both are apparently garden escapes of cultivated forms of *Iberis amara*.

William Kirkby.—Your criticism of Baron von Mueller's remarks will be communicated to him.

Erratum.—Page 24, column 1, end of line 23, for "they" read "the urine."

Obituary.

Notice has been received of the death of the following:—

On June 6, Stephen Massey, Chemist and Druggist, Fenton, Staffs. (Aged 62.)

On June 16, Frederick W. Irving, Chemist and Druggist, late Gosberton. (Aged 35.)

On June 19, Henry A. Williamson, Chemist and Druggist, of Scarborough. (Aged 57.)

On June 27, Charles J. Boorman, Chemist and Druggist, Malvern Link. (Aged 60.)

On July 1, John Dale, Chemist and Druggist, of Macclesfield. (Aged 54.)

On July 3, Joseph Ruston, Chemist and Druggist, Manchester. (Aged 45.)

Diary of the Week.

TUESDAY, JULY 24.

Photographic Society of Great Britain, at 8 p.m.

Adjourned Discussion on W. J. Wilson's paper on "The Development of Printing out Papers."

SATURDAY, JULY 28.

Quekett Microscopical Club.

Excursion to Norbiton for Richmond Park, returning from Richmond. To meet at Waterloo (south station.)

COMMUNICATIONS, LETTERS, etc., received from Messrs. Allen, Clarke, Clower, Cocks, Hill, Hyslop, Ince, Kirkby, Mathews, Mee, Moline, Naylor, Reynolds, Sicha.

“THE MONTH.”

Approximate Determination of Albumin in Urine. In cases where it is not essential that the determination of albumin in urine should be very exact, Rösaler recommends a volumetric method which can be carried out very readily, and gives results that are comparable. Into a test tube containing a mixture of 5 C.c. of acetic acid and two or three drops of potassium ferrocyanide solution (1 to 10), the urine to be tested is poured through a funnel, so as to form a layer on the surface. When albumin is present a white zone is formed, which is proportionate in thickness to the amount of albumin, and the indication thus afforded in from ten to thirty minutes may be taken as a measure of the relative proportion of albumin in the urine (*Apotheker Zeitung*, ix., 563).

Test for Chlorides. Villiers and Fayolle find that a still more delicate test than the one they recently proposed for chlorides (*Ph. J.*, liii., 1085) consists in substituting orthotoluidine for the aniline previously recommended. A sharp reaction is then obtained with less than 1/10 Mgm. of chlorine, a fine blue coloration resulting, and changing to reddish-violet on the application of heat or cold. The reaction is, however, not sharply defined from that given by bromides under similar conditions, unless aniline be also present. The following formula is therefore given for the reagent:—Colourless, saturated, aqueous solution of aniline, 100 C.c.; saturated, aqueous solution of orthotoluidine, 20 C.c.; glacial acetic acid, 30 C.c. On using this reagent, any bromides and iodides present are acted upon by the aniline, forming white or colourless compounds, and the action of the orthotoluidine on the chlorides present is not obscured (*Comp. rend.*, cxviii., 1413).

Crystallised Aluminium Carbide. H. Moissan has prepared, by the aid of his electric furnace, a crystallised compound of carbon and aluminium, represented by the formula C_3Al_4 . The compound occurs in the form of fine, transparent, yellow crystals, attaining a diameter of 5 Mm. to 6 Mm. in some instances. This density is 2.36, and the compound requires the highest temperature of the electric arc for decomposition. It possesses very marked reducing properties, and slowly decomposes water at the ordinary temperature, methane, CH_4 , being evolved (*Comp. rend.*, cxix., 16).

Piceine and Piceol. Piceine is the name applied to one of several new glucosides, obtained by M. Tanret from the leaves of *Pinus Picea* (*Sapin épicéa*). Crystallised from water its formula is $C_{14}H_{18}O_7 \cdot H_2O$. Both this and the anhydrous compound form silky prismatic needles, with a bitter taste. They are soluble in 1 part of boiling water, 50 parts of water at 15°, 20 of alcohol at 70° and 68 at 90°, 534 of absolute alcohol at 15° and 33 at boiling point, whilst acetic ether dissolves 1 part in 123 at 15°. The glucoside is insoluble in ether and chloroform, is dextrogyre, and when anhydrous melts at 194°. Under the influence of emulsin, or of dilute acids, it is split up into glucose and “piceol,” $C_8H_8O_2$. The latter melts at 109°, and is soluble in 100 parts of water at 15°, and in 14 parts at 100° (*Comp. rend.*, xix., 80).

Determination of Antipyrine. M. F. Schaak bases a colorimetric method of determining antipyrine on the colour reaction that occurs when sodium nitrite is added to an acidified, dilute solution of the base. The blue-green colour produced is said to be still perceptible in dilutions of 1 in 20,000, whilst in more concentrated solutions a crystalline precipitate of the same colour is formed. It was found that a standard solution, stable for twelve to twenty-four hours, can be made by dissolving antipyrine, 0.02 Gm., in water, 25 C.c., adding 1 per cent. sulphuric acid, 1.6 C.c., and 1 per cent. sodium nitrite solution, 0.8 C.c., then diluting to 100 C.c. When preparing a solution of an unknown amount for comparison with the standard, a few preliminary trials should be made to determine the amounts of reagents required to fully develop the colour, without being in excess, and to avoid precipitation the solution must not be more concentrated than 1 in 500. When properly prepared, the solution can be diluted until the colour corresponds exactly with that of the standard, and the amount of antipyrine present is then readily determined by calculation. The reagents employed do not react with other substances, except pyrazolon compounds, which are not of frequent occurrence (*Am. Journ. Pharm.*, lxvi., 322).

Iodides of Narceine. G. B. Frankforter describes these compounds. The blue iodide, $(C_{22}H_{27}NO_3)_2I_2 \cdot 3H_2O$, is formed when narceine is treated with an aqueous solution of iodine. Also, by treating crystals of narceine direct with iodine, indigo-blue crystals are formed, which retain the same crystalline form as the narceine. On heating these crystals they change from fine long prismatic needles to short irregular ones. The blue crystals are slightly soluble in water, soluble with difficulty in alcohol quite insoluble in ether or chloroform, and melt at 176°–177°. The red iodide, $(C_{22}H_{27}NO_3)_2I$, is formed by treating narceine with an alcoholic solution of iodine, the greyish-blue product changing to red and losing its crystalline form on standing in the air or gently heating. It melts at 181°, and is insoluble in water, alcohol, or ether. Both iodides are transformed into narceine by carefully neutralising with sodium hydroxide. In the presence of an alkali no iodide is formed from narceine (*Journ. Am. Chem. Soc.*, xvi., 361).

Micro-chemistry of Albuminoids. Dr. DeWivre concludes an exhaustive communication on the methods employed in micro-chemical researches on the albuminoids, by stating that these compounds cannot be localised by any single reagent, a combination being required always. He recommends that sections should be boiled first in water, and then in absolute alcohol, before adding reagents. The best of these for the purpose, arranged in the order of their sensibility, are iodised potassium iodide or an aqueous solution of eosine; Millon's reagent; picric, xanthoproteic, or phosphomolybdic acid, and Gueza's reaction; Piotrowski's biuret reaction; Reichel and Mikosch's reaction. If all these reagents act, after treatment of the sections with boiling water and alcohol, it is safe to conclude that proteid substances are present. In Gueza's reaction a concentrated solution of nickel sulphate saturated with ammonia turns yellow or blue with

protein matters, the blue changing to orange yellow on adding caustic potash. Reichel and Mikosch's method is to add to the substance under examination about twenty drops of an alcoholic solution of benzaldehyde, followed by an excess of sulphuric acid diluted with its own bulk of water, and containing traces of ferric sulphate. An intense blue coloration is thus imparted to albuminoids. Absolute alcohol is recommended as the best coagulating medium; and the xanthoproteic reaction is said to be very good for sieve tubes, in place of eosine. It is stated also that the albuminoid reactions of sieve tubes are not always very intense, and that a large quantity of protein substances occurs in the growing points of roots and in the laticiferous tubes of various plants, notably *Carica papaya* (*Journ de Pharm. d'Anvers*, 1, 209).

Yeast Cells and Fermentation. A. J. Brown points out that the usually accepted view, originated by Pasteur, as to the cause of the inhibition of fermentative functions by yeast cells is that it is a starvation phenomenon, brought about by lack of free oxygen during the life of the cells in a fermentable liquid. Briefly this may be defined as "life without air." Pasteur's experiments are reviewed by Brown in conjunction with the results of some of his own, which contradict Pasteur's theory, and he concludes that there is no *prima facie* reason why the yeast cells should not exercise their fermentation functions independently of their environment, so far as the presence or absence of free oxygen is concerned, and that there is nothing in Pasteur's experiments to contradict this (*Proc. Chem. Soc.*, 141, 159).

Ferments and Antiseptics. J. Effront has previously shown (*Ph. J.*, liii., 441) that beer yeasts, after becoming accustomed to the antiseptic action of fluorine, manifest a change in the chemical products of their activity. He has now demonstrated that similar modifications can be produced, in the same way, in the results of the fermentative processes induced by the lactic, butyric, and acetic ferments, secondary products being formed in addition to those usually obtained. As in the case of yeast, the fermentative power is also augmented, though the increase of the ferments is checked (*Comp. rend.*, cxix., 169).

American Peppermint Oil. Drs. Power and Kleber have determined the constituents of this oil, which they summarise as follows:—Acetaldehyde, $\text{CH}_3\text{—COH}$; valeraldehyde, $(\text{CH}_2)_4\text{CH—COH}$; acetic acid, $\text{CH}_3\text{—COOH}$; iso-valeric acid, $(\text{CH}_2)_3\text{CH—COOH}$; pinene (inactive?), $\text{C}_{10}\text{H}_{16}$; phellandrene, $\text{C}_{10}\text{H}_{16}$; lavograte limonene, $\text{C}_{10}\text{H}_{16}$; cineol, $\text{C}_{10}\text{H}_{18}\text{O}$; menthone, $\text{C}_{10}\text{H}_{18}\text{O}$; menthyl, $\text{C}_{10}\text{H}_{19}\text{—OH}$; menthyl acetate, $\text{C}_{10}\text{H}_{19}\text{—C}_2\text{H}_3\text{O}_2$; menthyl iso-valerate, $\text{C}_{10}\text{H}_{19}\text{—C}_4\text{H}_7\text{O}_2$; menthyl ester of an acid, $\text{C}_8\text{H}_{15}\text{O}_2\text{—C}_{10}\text{H}_{19}$; $\text{C}_8\text{H}_{11}\text{O}_2$; a lactone, $\text{C}_{10}\text{H}_{18}\text{O}_3$; and cadinene, $\text{C}_{15}\text{H}_{24}$. Though the composition of the oil is so exceedingly complex, it may be assumed that most of the constituent compounds are in genetic connection with each other, and that the processes by which they are produced in the plant are relatively simple. The specific gravity of peppermint oil generally is stated as varying between 0.905 and 0.916, and its optical rotation in a 100 Mm. tube lies between -25° and -35° . The amount of menthol in the form of esters varies

between 3.45 and 14.12 per cent., and the amount of free menthol from 24.2 to 73.7 per cent. The American product is less rich in menthol than Mitcham, Saxon, or Japanese oil, the last being richest of all (*Fritzsche Brothers' Circular*, No. 3).

Areca Catechu. T. Osenbrüg has studied the development of the areca nut. The areca palm is crowned with eight or ten leaves, and produces successively three or four inflorescences, which exhibit as many stages of development. The pericarp of the unripe fruit is green, that of the ripe yellowish-red; it encloses the seed, which lies nearer the apex than the base. The pericarp is differentiated into three layers, the outer of which is thin. The middle layer consists principally of fibres, and is permeated by fibrovascular bundles, whilst the inner layer forms a thin but firm shell enclosing the seed; the fruit is therefore to be regarded as a drupe. The fibres of the middle layer consist of bundles of sclerenchymatous fibres, and either accompany the fibrovascular bundles or take a separate course; they frequently anastomose, and thus produce the fibrous toughness of the pericarp. These bundles are accompanied by stone-cells, the number of which increases until the hard inner layer is formed. The pericarp also contains raphides in bundles, and cells filled with a red secretion. The seed is bluntly conical, and possesses on the flat side a small warty excrescence, the micropyle, which in drying forms a little depression. The testa lies closely applied to the cartilaginous endosperm. The outer layers are mostly lignified and easily removed; in the ripe seed they are often absent. The inner layers are brown and contain tannin. The cell walls in the endosperm are much thickened, and have few but large areolated pores. The ovule has two integuments; the formation of the rumination commences in the funicular region by the development of masses of tissue in the form of horse-shoes opposite the fibrovascular bundles. Smaller masses are formed opposite to the branches of the fibrovascular bundles. The brown lines seen on a section of the seed consist of cells containing tannin. They are arranged in a layer two or three cells wide immediately under the epidermis, and accompany the fibrovascular bundles into the ruminations. The principal alkaloid, arecoline, is not deposited in the endosperm, but in the ruminations; this localisation of alkaloid and tannin is regarded by the author as a protection to the plant (*Dissertation*, Marburg, 1894).

Strophanthus Glaber. The exact botanical source of the seeds that have been known in commerce under this name has never been accurately determined. Dr. Franchet suggested a few months ago that they were probably derived from the plant known as *Roupellia grata*, but as the fruits of the plant were not well known, the point remained doubtful. He has now received fruits from a cultivated plant of this species, which enable him to confirm without doubt his previous opinion, and to further show that, as suggested by Professor Baillon some years ago, the genus *Roupellia* must be sunk under *Strophanthus* as a section or sub-genus. Consequently *Strophanthus gratus*, Franch., will be the name in future for the plant yielding the glabrous *Strophanthus* seeds of commerce. Dr. Franchet believes, however, that some of this seed may be

yielded by the closely allied species, *S. Tholloni*, which has the same geographical distribution, viz., from the Equator to 5° N. lat. (*Journ. de Bot.*, viii., 201).

Wood
Creosote. Béhal and Choay, continuing their work on this subject (see vol. iii., 1087), find that beechwood creosote is richer in guaiacol and has a greater density than that from the wood of the oak. It also contains less monovalent phenols and is, consequently, less caustic, the causticity of creosote being essentially due to the monovalent phenols. Creosote is generally regarded as consisting of 60 to 90 per cent. of guaiacol, together with creosol, and a small proportion of monovalent phenols. The composition of beechwood creosote, passing over at 200° to 210°, is given, however, as follows:—Monovalent phenols, 39 per cent.; guaiacol, 26.48; creosol and its homologues, 32.14; loss, 2.38. Oakwood creosote, under similar conditions, yielded—monovalent phenols, 55 per cent.; guaiacol, 14; creosol and its homologues, 31 (*Comp. rend.*, cxix., 166).

A
"Diarrhœa
Plant." Some fruits have been received at the Royal Gardens, Kew, of a shrub inhabiting northern Central Australia. They were collected by L. G. Browne, who states that the natives employ the plant with good effect in cases of diarrhœa. Apparently, the fruits are from a small-fruited species of *Zizyphus*, near *Z. ænophia*. All the species of this genus are probably astringent (*Kew Bulletin*, June, 193).

Respiration
of
Leaves. L. Maquenne has endeavoured to throw fresh light on this subject by comparing the respiration of different kinds of leaves, both in the normal state and after previously remaining for some hours in a vacuum. He wished to ascertain, if possible, whether the evolution of carbon dioxide by plants is due, as in fermentation, to the splitting up of some compound previously oxidised; or if it is the result of the combustion, pure and simple, of some principle continuously elaborated by the plant, that oxidises on exposure to air. Maquenne favoured the second of these hypotheses, according to which the living cell constantly secretes a combustible substance which, by simple exposure to air, oxidises and gives off carbon dioxide. By checking the action of the oxygen this product would accumulate, so that, on the plant being again brought in contact with the air, respiration would be increased accordingly. To avoid the introduction of error due to differences in the specimens experimented with, the leaves compared were, in each case, taken from the same plant, besides being of the same weight and as nearly as possible of the same age. As a result of the experiments it was found that, in all cases where the plant was able to resist the effects of the vacuum, without undergoing appreciable alteration, it afterwards disengaged a much larger quantity of carbon dioxide than it would have done had it simply been left exposed to the air. Figures based on actual experiment with a number of leaves appear to go far towards proving the truth of the hypothesis (*Comp. rend.*, cxix., 100).

Secretion
Ducts. W. Sieck contributes the results of work undertaken with the object of throwing some light upon the formation of the so-called "schizo-lysigenous" secretion-ducts, especially in Rutaceæ and Dipteroocarpeæ. Anatomists have long been at variance concerning

the origin and growth of these ducts in rutaceous plants, some insisting on their purely schizogenous, others on their purely lysigenous origin and development, whilst others again have maintained that the origin is schizogenous, but the development lysigenous. In Rutaceæ, W. Sieck finds a single cell divides, and the young cells thus produced separate schizogenously. The secretion (oil) is formed in the cell-wall bordering the cavity, and by its pressure bursts the thin mucilaginous membrane which retains it in the wall; it is then discharged into the cavity. The inner membrane, unable to withstand the extra pressure put upon it, also bursts, and the cavity thus increases lysigenously. Simultaneously, the middle lamella is converted into mucilage, and the cell breaks up. In *Anacardium occidentale* numerous cells which had become isolated in this manner were found free in the resinous secretion (*Archiv.*, cxxxii., 307).

H. Vincent described, at the staining last meeting of the Société de Micro-organismes Biologie, a staining process applicable to every variety of micro-organism occurring in the blood.

It is based upon the principle that colouring matters fix themselves to the hæmoglobin and not to the protoplasm. If, therefore, the hæmoglobin be removed, and the stain then applied, the blood globules remain uncoloured, whilst the microbes are coloured and stand out with great clearness. The blood is spread in a thin layer and slowly dried, after which it is treated with the following solution, which dissolves out the hæmoglobin:—Aqueous 5 per cent. carbolic solution, 6 C.c.; saturated solution of sodium chloride, 30 C.c.; glycerin, 30 C.c. Filter before use. From half a minute to two minutes suffices for this fluid to act, and it is then drained off, the blood washed with distilled water, and staining effected with carbolised methylene blue, to which from 1 to 20 per cent. of aqueous methyl violet solution has been added (*Medical Press*, cix., 10).

Danger of
Sublimates
Pastilles. Henning draws attention to the similarity of appearance between sweetmeats and sublimate pastilles, as being a probable source of danger, and mentions a case in which he was called upon to examine an article supposed to be a sweetmeat, which turned out to consist of mercuric chloride and common salt.

Adulterated
Belladonna
Root. C. B. Lowe has found pokeroor (*Phytolacca decandra*, L.) mixed with belladonna root, but it is easily distinguished from the latter, he remarks, by having a yellowish brown-grey cork layer, marked by transversely elongated warts of a lighter colour, whereas the cork layer of belladonna root is of a very light brown-grey colour. Belladonna also, in transverse section, shows a fine black cambium ring, and the radially arranged wood wedges are light yellow. In pokeroor, on the other hand, the woody tissue is whitish, and shows a distinctly concentric arrangement (*Am. Journ. Pharm.*, lxvi., 353). Pokeroor, as met with in this country, is not likely to be confounded with belladonna, since it is of much greater diameter. Belladonna root, too, which shows distinct wood wedges, is here regarded as old and too woody for use, and, indeed, is not in accordance with the description in the U.S. Pharmacopœia.

"THE DRUGGIST'S FIGHT FOR PRIVILEGE."

Under this heading, the *Whitehall Review* of Saturday last publishes the following pertinent article on a matter of great moment to chemists and druggists at the present time:—

In all ages, and in most parts of the world, there have always been two classes of humanity more or less at war with each other. The first represents those who, through the labour of themselves or their forefathers, possess something of current value; the other is composed of men not so fortunate. An opposition of interests, resulting from these facts, is productive of an everlasting contention, which exhibits its resources in, and by, methods as multitudinous as the numberless exigencies accruing to a state of civilisation. This postulate has been illustrated by a recent case, thrice fought out, with identical results, in our courts of law. We have all heard of *Derby*; but to admit a rooted knowledge of the existence of an individual named *Armson* of that place is quite another matter. Yet he lives, he sells, he fights. We have heard no hint of a pugilistic encounter, and yet the pother is all around a box of pills. Why should a grocer not sell pills? Some people may find it hard to swallow the bolus, but the Local Court, the Divisional Court, and the Court of Appeal all say that a patent pill, if possessing a poisonous potion, should only be procured from a pharmacist. This is the momentous question just decided for the third time of asking. Thus the chemists, for once, have scored a conquest.

Now, apart from all facetious surroundings and considerations, there is a great principle of government connected with this contest. It re-opens the problem of class privilege. In the good old days, when trade guilds held paramount sway in their several restricted spheres, it would have been practically impossible for a bricklayer to become a tailor. And even now, amongst a very different part of the community, such an artist of the humorous as *Toole* is not considered capable of assuming the tactical responsibilities of an *Evelyn Wood*. Through the decades of the past a judicious division of labour has developed the majestic resources of our glorious empire. But it may be that the growth of freedom has enfeebled the roots of freedom, from which prosperity evolves. And this aphorism seems to be becoming manifest amongst those persons who are sometimes contemptuously called middlemen—such distributors of the necessities of life as chemists and grocers.

Now, a chemist is a more or less educated man who has passed through the ordeal of an examination, and obtained the licence of the State to deal in physic and deadly drugs. With him knowledge and business are co-ordinate factors of existence. He studies for the purposes of business, and he subjugates business to the end of acquiring a better knowledge of his semi-profession. But a grocer is usually quite a different kind of individual. He orders sugar by the ton, and mixes tea by rule, and the one simple problem with which he continually grapples is how to multiply, or, at any rate, preserve intact, the

capital with which he commenced business. Such a man is not qualified to vend poisons and medicine—not even patent physic. Yet, assuming that the grocer is competent to sell a tin of lozenges, not knowing or caring of what deleterious substances they may be composed, it is not equity to transfer easy business from the chemist to the grocer, and leave the former to exist as best he may upon the diminished scope of mutilated privilege.

It may appear trivial to maintain that a grocer is not likely to be sufficient master of a chemist's special knowledge to become his legalised competitor, but it is not customary in time of war for generals and admirals to exchange duties. It is very questionable if the transference of a part of the liquor traffic from publicans to grocers has been a beneficial proceeding, and it seems equally undesirable to allow "universal providers" to dispense mechanically, by weight or measure, any medicinal substance, whether patented or not, of the chemical qualities of which they are almost necessarily ignorant.

So far, then, as the particular matter in question is concerned, it appears to be in accordance with the fitness of things that chemists should be allowed to appropriate a monopoly in the sale of drugs. But this reflection suggests a consideration of one of the fundamentals of political economy. While the liberty of the subject necessitates a scope for the exercise of individualism, the protection of the subject requires a socialistic restriction of desultory action—we mean to say that there is, was, and will be, a certain socialism of classes, by which lawyers, doctors, plumbers, and most other trades and professions, combine for the maintenance of their particular privileges, to the exclusion of all other men, to a very great extent, from the advantages of their various combinations. This conservative socialism is good, because it has a tendency to develop efficiency.

It may be hard for a man who has not been articulated or apprenticed to find it difficult to make headway in life, but a "Jack-of-all-trades," without a thorough knowledge of anything in particular, can never be a producer of the best work, whether mechanical or professional. There are indications on all hands, notwithstanding the prevalence of Liberal and Radical ideas, that greater value will be given to the almost obsolete plan of apprenticeship and the motto of "every man to his trade." Such a reverting to old-fashioned methods is desirable, as being calculated to promote that stability of government which results from a consciousness in men that the State is protecting their individual privileges and well earned prosperity.

ANTIPYRINE AND SPIRIT OF NITROUS ETHER.

Since the reaction between these preparations, and the consequent formation of nitroso-antipyrine, only takes place in the presence of free nitrous acid, *M. F. Schaak* suggests that the neutralisation of the spirit when acid, with potassium bicarbonate, will prevent the difficulty arising from its incompatibility with antipyrine (*Am. Journ. Pharm.*).

The Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JULY 28, 1894.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.C.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMIDGE, Secretary, 17, Bloomsbury Square, London, W.C.

Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STREET BROTHERS."

THE NOSTRUM TRADE.

THERE seems to be something in human nature that makes it impossible to stop the ever-increasing irregular traffic in medicinal remedies. The law leaves the medical profession and the pharmaceutical body to look after their own interests, and seldom interferes with the great interest which the public has in the matter, except in the form of a coroner's inquest. The wholesale robbery of ignorant persons that goes on through the agency of advertisements has been so often referred to in these columns that it need not now be described in detail, but in some cases of really potent remedies it may be asked whether some practical steps should not be taken to check their sale direct to consumers without the intervention of the qualified medical man to prescribe and the qualified chemist to dispense. One "world-famed" preparation, which owes its power to iodide of potassium, is recommended in advertisements adorned by testimonials from persons who, surely, little dream that their testimony amounts to a confession of their having suffered from syphilis. Another preparation, containing strychnine, is gravely recommended for difficult or painful parturition, amongst a host of other ills, and its proprietors, assuming the rôle of the physician, give rules for the general management of health, which include the sapient advice that those who suffer from rickets should take exercise on horseback. We need not refer at length to the host of American advertisements which load every medical man's waste-paper basket. A large proportion of the preparations they relate to are said to give vigour to the sexual organs. We may take one example to show their impertinence. This is the "Od Quarterly, a free journal of practical therapeutics for physicians only." This precious publication, which puffs a nostrum for all disorders of the sexual organs, from stricture of the urethra to "pre-senility," is composed of testimonials

from medical men unknown to fame, interlarded with pithy aphorisms for the guidance of medical practitioners, who, in their ingratitude, consign the "Quarterly" unread to their waste-paper basket. Some of these aphorisms may be quoted: "When you are in doubt as to the diagnosis, examine the urine." "Cocaine prevents suppuration in small-pox." "Citric acid is said to be a prompt remedy to stop nose-bleeding. A solution injected into the nostrils." "Excessive vomiting is easily controlled by administering one-half to one drop of oil of cloves in a little water." "Muriate of ammonium in full doses will overcome the immediate effects of drunkenness." We may judge how much the medical profession lose by not reading this paper, but they are at any rate spared the bitter regret of having spent years of study and large sums of money in learning their profession.

Indeed, with such numbers of proprietary remedies manufactured at home and abroad there appears to be no longer any call for the art of prescribing or the art of dispensing. The pharmaceutical chemist may save time and trouble, and escape the task of dispensing and of learning to dispense. He need not be more than a salesman, and might well combine his occupation with that of a grocer or an oilman. Indeed, we may ask what need there is of him at all? when simple girls as well as he can hand over the proprietary medicine counter all that the doctor need prescribe, all that the patient need consume. Such facile distribution as this would economically replace that old-world person, the pharmaceutical chemist, and largely does so, in our metropolitan "universal-provider" emporia. The chemist gone, why keep the doctor? As education increases, board school physiology, backed up by the medical column of the weekly newspaper, would help the populace to choose their remedies. Thus a perusal of the advertisement referred to above would lead the woman labouring to excess of child to send straightway for a bottle of the syrup and dismiss the accoucheurs. Though obtaining money by false pretences is a penal offence, money is daily obtained in golden piles by means of lying quack advertisements, and yet the law is difficult to apply. Expensive shops for the sale of electrical appliances are not kept up by philanthropists, as we have lately been made aware. The eyes of the public are opened now and again, but they quickly close, so that it becomes worth while to expose advertisements, such as "The new scientific 'Aural Battery' (patented) cures deafness, head noises, discharges, etc., no matter of how long standing or from what cause arising, etc. Artificial ear-drums superseded." The more common-sense is outraged by the effrontery of the quack the greater the confidence of his prey. "Cancer cured without the knife" is the cry of the surgical quack.

The victim, in hypnotic terror of the knife, bears patiently the torture of arsenical caustics without a murmur, and is made to forget that, while the knife would not be felt, the prolonged torture of the cauterisation will be all in vain.

Before attempting to answer the question whether it would not be well to do away with all irregular prescribing, operating and dispensing, we must reflect that a certain amount of reactionary spirit is healthful to all institutions, even to that of medicine. There is also another side to the question. We must take account of the vast amount of pleasure many matrons derive from the study of the 'Homœopathic Look-within-for-Everything,' as applied to the occupants of the homestead, from the children to the cows. Perhaps some guidance may be gained by inquiring what course medical men pursue when they fall ill themselves. Do they fly to the cure-all quack? Do they not rather seek the aid of one of their colleagues, and obey him?—somewhat peevishly at times, perhaps. This may lead us to an answer. Moreover, we are told there is plenty of reactionary spirit intrinsic in the medical profession itself to keep it healthy. No regular practitioner regards medical science as complete and perfect, but all strive after perfection. They forget, perhaps, the pure HAHNEMANNIAN, who says all ills, from cancer to toothache—everything—can be cured by pale phantoms of drugs. But they have heard of ultra-homœopaths crying loudly for the knife to be used on themselves, while their patients in similar straits are dosed with much daily profit—to whom need not be said. And if it were possible to out off unqualified and irregular practitioners of physic and pharmacy root and branch, should they be compelled to cease from troubling? Have they done no good? That is a difficult question to answer. The homœopaths have shown that many ailments are recovered from by nature, and without even their mystic minim-millionths. But the "reverend" consumption-curing quack? Must he be held sacred, because his puffs appear in religious weeklies? Is he to be allowed to sweep to his pouch what he can, between the last sad visit of the honourable practitioner, and the incoming of the undertaker, while the chemist and druggist is given the chance of being thankful for his reverence's sop in the shape of a lotion to be made up. Quacks there will be to the end, in and out of medicine. But their number has become so great that their victims are legion. The public interest demands that those who know how much loss of life, or danger to life, is incurred by misleading advertisements such as we have referred to, should speak out frequently and conspicuously. Public interest at least demands that he composition of proprietary nostrums of all

grades and shades should be made known. Those who have spent time and money in acquiring competence and qualification for the practice of medicine and pharmacy must protect themselves. Whatever virtue there may be in any nostrum sold directly to the public without the recommendation of a physician can be obtained with prescriptions made up in the usual way. Medical men should refuse to prescribe such compounds, druggists should cease to sell them. Above all the public must be educated. The quack preys upon ignorance. Ignorance removed, the game of the quack is gone. In the more flagrant cases, if the medical profession and the pharmaceutical body could jointly establish machinery for the purpose, we have no doubt that judicious management would bring impostors to feel the suppressive power of the law.

HANDBOOK TO THE CONFERENCE MEETING AT OXFORD.

WITH a view to adding somewhat to the interest of the Oxford meeting, the articles that have recently appeared in the Journal on "Oxford and its University" have been carefully revised and reprinted in a separate form. A detailed, anticipatory account of the Conference proceedings has also been added, together with a number of tables of information useful to visitors, and the whole work is fully illustrated with blocks and maps. A copy of this illustrated handbook will be presented to everyone attending the Conference meeting at Oxford, with the compliments of the Editor of this Journal. There will probably be a limited number of surplus copies, and any reader of the Journal who may be unable to attend the meeting, yet is desirous of possessing a copy, is requested to send an intimation to that effect, together with an addressed wrapper, stamped with a three-halfpenny stamp, to the Editorial Department, 17, Bloomsbury Square, W.C. It may be well to state that this handbook is in nowise intended to serve as a guide to Oxford and its places of interest. That purpose is already thoroughly well served by ALDEN'S "Oxford Guide," the larger edition of which is particularly complete, and contains a remarkably fine plan of the city. SHRIMPSON'S "Gossiping Guide to Oxford" is also very good, and SALTER'S "Guide to the River Thames" will be found useful in connection with the river excursion. For those who desire to read a connected account of the development, side by side, of the city and its educational foundations, there is no more desirable work than Dr. GOLDWIN SMITH'S attractive little book on "Oxford and Her Colleges" (MACMILLAN and Co.), which was largely utilised in the compilation of the articles that have appeared in the Journal.

CONFERENCE MEETING AT OXFORD.

No change has so far been announced in the arrangements for the Conference meeting, which were published in the Journal for July 7 (see p. 7), and they may therefore be regarded as final. The concluding list of papers promised is as follows:—

18. *Medicinal Rhubarb and Henbane*, by R. Usher.

19. *The Calibration of Pipettes*, by J. F. Liverseege, F.I.C.

20. *The Nomenclature of Official Remedies*, by Joseph Ince.

21. *Extract of Indian Hemp*, by David Hooper, F.I.C.

22. *Laboratory Notes*, by F. C. J. Bird.

23. *The Keeping Qualities of Certain Samples of Spirit of Nitrous Ether*, by H. W. Jones, F.C.S.

24. *Note on Extract of Malt with Cod Liver Oil*, by H. W. Jones, F.C.S.

25. *Notes on the Geology, Botany, and River Systems of Oxford and Neighbourhood*, by G. C. Druce, M.A.

26. *The Qualities of a Typical Dentifrice*, by Arthur Turner, F.C.S., L.D.S.

27. *The Pharmacopœial Instructions for the Preparation of Tinctures*, by R. H. Parker, F.C.S.

DANGERS OF DISINFECTANTS.

A CURIOUS instance of the risks engendered by the ignorant use of disinfectants and antiseptics is reported from Leith. There has recently been an epidemic of small-pox at that seaport, and bags or boxes containing camphor have been in great request amongst the inhabitants. One unfortunate individual, however, seems to have been struck with a more original idea, and substituted potassium permanganate for the camphor. The result is apparent from the following:—"I had a small bag of permanganate of potass., a disinfectant, but it got melted with the sweat, and has given me a rather severe burn on the chest. Would you be as kind as give me something that will help to take the pain away." This case affords one more instance of the advantages that may accrue if pharmacists introduce the "personal equation" into all sales effected by them, since a few words of inquiry and warning may often prevent injury to the purchaser and give rise to increased faith in the skill of the seller.

PHARMACY ACT CASE AT ST. HELENS.

ON the principal that a person charged with an offence against the law is to be given the benefit of any doubt arising as to his capability, the defendant in the case at St. Helens, reported at page 84, has had judgment given in his favour on account of the contradictory evidence given by the witnesses at the hearing of the case. As having an important bearing upon the peculiar conflict of evidence in the case, it seems, however, desirable to state that Mr. WALLBRIDGE, the local secretary, whose name was so freely mentioned by witnesses for the defence—had no knowledge whatever that the case was to be heard. He had no connection with the proceedings from beginning to end, and, as we understand, he

obtained his first knowledge of the case from the local newspaper reports. A letter from Mr. Wallbridge appears at page 90.

FEDERATION OF LOCAL ASSOCIATIONS.

ACCORDING to a circular letter received from Mr. CHARLES THOMPSON, Hon. Secretary *pro tem.*, the delegates appointed by the local pharmaceutical associations in connection with the proposed system of federation are requested to meet at the Randolph Hotel, Oxford, at 6 p.m., on Monday, July 30. The business will be (1) to receive the report of the interim committee appointed at Nottingham; (2) to elect officers; (3) general. Should the business not be completed by 8 o'clock, the meeting will adjourn until the following Friday morning at such hour as may be decided upon.

PRESENTATION TO A TEACHER OF PHARMACY.

ON Thursday evening, July 19, at Daish's Rooms, South Street, Andrew Street, Edinburgh, Mr. WILLIAM DUNCAN, pharmaceutical chemist, apothecary to the Royal Public Dispensary, and teacher of pharmacy, was the recipient of a testimonial subscribed for by a large number of his former students who have qualified as pharmaceutical chemists, or chemists and druggists. Mr. PETER BOAG made the presentation, which consisted of a silver tray and tea and coffee service, enclosed in a handsome oak cabinet case. On the tray the following inscription is engraved:—"Presented to WILLIAM DUNCAN, Esq., Pharmaceutical Chemist, Royal Dispensary, along with a silver tea and coffee service, by his former students, on the occasion of his marriage, as an expression of their appreciation of his abilities as a teacher, and a token of their sincere esteem. Edinburgh, 19th July, 1894."

SCIENCE SCHOLARSHIPS.

THE EDWARD FORBES Medal and a prize of books—value about twenty pounds—have just been awarded to Mr. G. S. WEST, son of Mr. WM. WEST, a Bradford chemist, as first amongst the advanced students in biology at the Royal College of Science. He has previously had a very successful career, and has now been granted a first-class associateship of the College. His brother, WM. WEST, after an equally distinguished career, has recently been elected a Scholar of St. John's College, Cambridge, on account of his position in the first-class honours list at the recent Natural Sciences Tripos, Part I., having taken this examination in his second year. Both of the brothers were originally trained for the practice of pharmacy.

ROYAL INSTITUTION.

AT the last general meeting of the Royal Institution a donation of £25 was acknowledged from Sir DOUGLAS GALTON to the fund for the promotion of experimental research at low temperatures.

UNIVERSITY COLLEGE, LIVERPOOL.

IT was announced at the last meeting of the Council of University College, Liverpool, that the Rev. S. A. THOMPSON YATES had given the sum of £15,000 to build physiological and pathological laboratories.

Transactions of the Pharmaceutical Society of Great Britain.

EXAMINATIONS IN LONDON.

July, 1894.

(Continued from p. 45).

MINOR EXAMINATION—PASS LIST.

Candidates examined.....	291
„ failed	169
„ passed	122

Adams, William Wright	Birmingham.
Ahler, Ernest	Jersey.
Allen, John Harry Stanley	Leicester.
Averill, Morris	Stafford.
Aves, Ernest Harold	Mansfield.
Baker, John James	Jersey.
Baker, William Charles	Edinburgh.
Barker, Robert	Mold.
Beckwith, John Batty	Liverpool.
Berrill, Edith Annie	London.
Bloor, Frederick Arthur	Southport.
Blunt, Henry Rowland	Birmingham.
Blyth, Isabella	Sunderland.
Bostock, John	Wrexham.
Boyce, Herbert George	Downham Market.
Brawn, Harry Samuel	Spalding.
Bresse, John Soley	Llanidloes.
Buckingham, Harry	Coventry.
Burgess, Sydney Robert	Luton.
Burland, Walter Vincent	York.
Burnage, William Arthur	Newport, I.W.
Burrell, Benjamin Lawson	Leeds.
Burrows, Harry	Southgate.
Cadman, Charles Thomas	Blackheath.
Cariss, William	York.
Chester, Charles Henry	Kettering.
Clarke, Thomas Cooper	Coventry.
Clarke, Thomas Joseph	Derby.
Coleman, John Harold	Wolverhampton.
Cooch, Wm. Albert Brooks	London.
Cooper, George Henry	Oldham.
Cranston, Edward	New Barnet.
Cross, Louis Archibald	Cambridge.
Cundall, Thomas Bowser	Pocklington.
Dales, Edward	Louth.
Daniels, Joseph William	Landport.
Darling, George William	Datchet.
Davies, David Evans	Pontypridd.
Delaney, Edwin Louis	London.
Douthwaite, John	Prudhoe-on-Tyne.
Edwards, Daniel	Pontardulais.
Ellington, Chas. Sampson	Rochester.
Elwell, Frederick Budd	Landport.
Endall, Edward Albert	Brighton.
Evans, Evan Castell	Llanarth.
Faulkner, William	Newark.
Felthouse, Arthur George	Rugeley.
Feltwell, John Greenwood	London.
Flood, Fanny	London.
Gaul, Ernest George	London.
Gledhill, William	Steeeton.
Greenhalgh, Edmund Parkinson	Bolton.
Hague, John	Lincoln.
Hall, Jasper Longsdon	Wirksworth.
Harbin, George Albert	Landport.
Hartland, Charles	Oldbury.
Hawes, John Geo. Hoadley	Chichester.
Haythornthwaite, William	Giggleswick.
Heekes, John William	London.
Hendry, Fred Harry	Hull.
Hewlins, William Richard	Littlehampton.
Hick, Wm. Henry Henwood	London.
Holmes, John	Bradford.
Horton, William John	Woburn.
Hough, Thomas	Northwich.
Hughes, Job	London.
Jarvis, Samuel Horace	Leicester.
Jennings, Cornelius	Birmingham.
Jennings, Henry George Herbert	Bulwell.
John, Alfred	Swansea.
King, Ebenezer Thomas	Reading.
Kitley, Sydney	Bath.
Knight, George Thomas	Halesowen.
Lawson, Albert Edward	Shrewsbury.
Lee, John Outhbert	Wainfleet.
Lewis, David Evan	Cardigan.
Little, Thomas	London.
Lloyd, Henry Morgan	Dowlais.
Lodder, Arthur Edward	Reading.
Male, Elliott Wm. Graves	Soham.
Marsh, Alfred Edward	Luton.
Nicholls, Ralph	Devonport.
Nichols, William Hartley	Leeds.
Oldham, Harry	Hyde.
Parker, Herbert Charles	Stamford.
Paternoster, Wm. Chas. Tisdall	Cirencester.
Perrett, Henry John	London.
Pitt, Charles Frederick	Bristol.
Pitt, Geo. Metford Farquharson	Bristol.
Potter, Thomas Burbidge	Leicester.
Priestley, Dawson Smith	Bradford.
Prior, James Siddall	Manchester.
Richards, Emrys	Pontypridd.
Richardson, John Ffraild	Liverpool.
Rymer, Frederick Victor	Northampton.
Sadler, Walter	Tamworth.
Shattock, John Bellett	Bradford.
Shorthouse, Herbert Stephen	Birmingham.
Simpson, James Hill	Market Drayton.
Skeates, Frank	Bath.
Smedley, Walter Graham	Northampton.
Smith, Philip	Luton.
Sonley, Walter	Littleborough.
Spinney, William Frank	Bournemouth.
Sproston, Francis John	Ardwick.
Stanton, Frank Leonard	Bridgnorth.
Stow, Norman Vincent	Castle Northwich.
Sutton, John	Newport, Mon.
Tapper, Chas. Albert Henry	Bristol.
Thomas, Charles Herbert	Shepton Mallet.
Thomas, Hugh Wolseley	Blaenavon.
Thorne, Alfred John	Tunbridge Wells.
Tims, Edgar Orlando	Leicester.
Townsend, William Alfred	Bristol.
Trounson, Herbert James	London.
Turner, John Arthur	York.
Vogt, George	Kendal.
Ward, George Stafford	Gloucester.
Ware, Alan Henry	Exeter.
Wharram, Thomas Barnard	Naburn.
Wolstenholme, Austin Whitley	York.
Wright, Edward	Peterborough.

FIRST EXAMINATION—PASS LIST.

July, 1894.

The College of Preceptors reports that 490 candidates presented themselves for this examination, and that 253 failed. The following are the names of the 237 successful candidates:—

Allison, J. W. Woodman	Cockermouth.
Altaras, Moses	Manchester.
Angus, James	Lerwick.

Atkins, William.....Newcastle-on-Tyne
 Atkinson, Frederick.....Darlington.
 Awcock, Herbert Froud.....Southborough.
 Bach, Charles Vincent.....Birmingham.
 Bailey, Edward Arthur.....Boston.
 Baillie, James.....Loanhead.
 Ball, Allan.....Southampton.
 Ball, Ernest Harry.....Bolton-le-Moora.
 Bellingall, Thomas Mylne.....Inverness.
 Bambrrough, Wilfrid Ernest.....Bristol.
 Bannister, Frank Ewart.....Netherton.
 Barley, Maurice A. Hurd.....Tunstall.
 Beecroft, Frederick.....Sutton-in-Ashfield.
 Bell, James A.....Greenock.
 Bell, William James.....N. Shields.
 Bennett, Henry Stagg.....Ipswich.
 Bennett, Oswald Edward.....Bristol.
 Britten, George Bertrand.....Leeds.
 Brown, George.....Forfar.
 Brown, John.....Sprouston.
 Bryan, David Allen.....Holywell.
 Buchanan, Alex. Glen, jun.....Govan.
 Cain, John.....Douglas.
 Caldwell, George Yuille.....Annan.
 Cannell, Fletcher Ernest.....Douglas.
 Cartwright, William Ernest.....Louth.
 Cashmore, Montague.....London.
 Cathcart, Percival James A.....Buxton.
 Charles, Percy David.....Bristol.
 Cooper, Edwin Rawlinson.....Heaton Moor.
 Cox, William.....King Edward, N.B.
 Crabb, James Stuart.....Ascot.
 Crane, William Thomas.....Northampton.
 Crawford, William.....Durham.
 Croft, William Francis.....Chesterfield.
 Cross, George.....Hamilton.
 Cathbertson, Lucy Maud M.....Birmingham.
 Daton, William John.....Bristol.
 Davies, Alfred Carey.....Wrexham.
 Davies, Jenkin Owen.....Swansea.
 Davies, William Osborne.....Llanidloes.
 Dawson, Frederick Jas. B.....Winterton.
 Dearden, Theodore Ernest.....Luddendenfoot.
 Deck, Reginald.....Southampton.
 Dennis, James Edward.....Broadstairs.
 Dickinson, Henry Casson.....Darlington.
 Dixon, Charles Robert.....Ryton.
 Duff, Peter Methven.....Mauchline.
 Duncan, George.....Dundee.
 Duncan, Robert.....Fortrie.
 Dyson, Joshua.....Brighouse.
 Elder, Charles.....Lochee.
 Elder, John.....Dundee.
 Eldred, Willie.....Hythe.
 Elkington, Charles John.....Rugby.
 Ellison, Arthur Mason.....Hoyland Common.
 Evans, Arthur Morgan.....Colwyn Bay.
 Evans, Evan Arthur.....Birkenhead.
 Evans, Harry John.....Hackney.
 Farr, Francis William.....Yaxley.
 Fife, John Henry.....Rothesay.
 Foreman, Albert Edward.....Newcastle-on-Tyne
 Forman, John William.....Louth.
 Fox, Robert.....Norwich.
 Francis, James Bowen.....Milford Haven.
 Francis, William Lloyd.....Carmarthen.
 Geddes, Andrew.....Alyth.
 Gibson, Frederick Ingleby.....Birmingham.
 Gordon, Thomas McG.....Kirkcaldy.
 Gray, George William.....Darlington.
 Green, George Henry.....Bristol.
 Gregson, William Arthur.....Walsall.
 Griffin, Alfred Sercombe.....Bath.
 Griffith, Charles Joseph.....Canterbury.
 Griffith, Francis Peter.....Canterbury.
 Griffiths, Francis.....Nottingham.

Gridale, William.....Kewick.
 Hall, Arthur.....Chesterfield.
 Halstead, Halsey Clegg.....Rawtenstall.
 Hands, George Walter.....Birmingham.
 Hardie, Charles MacIntyre.....Dundee.
 Hardy, Thomas Conyers.....Newcastle-on-Tyne
 Harris, John Hewitson.....Wigton.
 Harvey, Reginald.....Kilmarnock.
 Henderson, Robert.....Bridge of Allan.
 Hendry, Alexander Wilson.....Tillicoultry.
 Hickling, Alfred John.....Stamford.
 Hill, John Stableford.....South Shields.
 Hillier, Henry Edgar.....Marlborough.
 Hird, John.....Richmond.
 Hird, William Smith.....Ulverston.
 Hogbin, Edwin Richard.....Salisbury.
 Holding, John Thomas.....Newcastle-un-Lyme
 Holland, Thomas Herbert.....Wolverhampton.
 Holmes, Oscar Dewhirst.....Sheffield.
 Howes, Hubert.....Workington.
 Howitt, Walter Henry.....London.
 Hughes, Henry.....Portmadoc.
 Hunter, John Edwin.....Manchester.
 Hyde, Charles.....Stalybridge.
 Innes, George.....Portgordon.
 Innes, John Alexander.....London.
 Ivey, Francis Reginald.....Truro.
 Jackson, Alexander Logan.....Blyth.
 Jackson, Herbert.....Grimsby.
 James, Evan.....Pencader.
 James, Joseph Marshal.....Spalding.
 James, Walter Henry.....Pontypool.
 Jenkins, Herbert.....Cricklewood.
 Jephcott, Charles Josiah.....Redditch.
 Johnson, Samuel.....Bradford.
 Jones, John Robert.....Mold.
 Jones, Thomas.....Llandysul.
 Kirby, Herbert.....Malton.
 Kirby, William.....Thirsk.
 Knowles, Fred.....Melbourne.
 Lasham, Herbert Crocker.....Wisbech.
 Little, William Penrice.....Newcastle-on-Tyne
 Lloyd, Arthur Stanley.....Swansea.
 Lloyd, John Barrow.....Liverpool.
 Lloyd, Morris Wyn.....Colwyn Bay.
 Lodge, George Newton.....Leeds.
 Low, David.....Laurencekirk.
 Lucas, Alfred.....Richmond.
 McDonald, Robert Stirling.....Kelso.
 McIntosh, Fletcher Menzies.....Edinburgh.
 McKechnie, Donald Neil.....Edinburgh.
 McMillan, Allan.....Hull.
 McPherson, Neil.....Aberdeen.
 Maddison, Edwin Robson.....Brotton.
 Manning, Reginald Henry.....Modbury.
 Mason, Horace Dernocoure.....Crawley.
 Melhuish, Thomas.....Scarborough.
 Micklewright, George.....Crewe.
 Misselbrook, Wm. Montrose.....Norwich.
 Mitchell, Austin.....Sheffield.
 Mitchell, James.....Alnwick.
 Mitchell, Willie D.....Annan.
 Moore, James.....Belfast.
 Morrison, William.....Macduff.
 Mosley, William Francis.....Longton.
 Moyes, David.....Stirling.
 Neale, Ernest Horace.....Burton-on-Trent.
 Newman, Edward Charles.....Southsea.
 Northey, Sydney Moore.....Bodmin.
 Ordidge, Walter.....Saltley.
 Orrell, William Herbert.....Bolton.
 Palfrey, Thos. Alexander.....Alva.
 Parker, Frederick Rutter.....N. Shields.
 Parker, Reginald Evan Wm.....Coventry.
 Parry, George Wm. Jarrett.....Rhoeddu.
 Parson, Sydney James.....Cambridge.

Paterson, James Jenkins Turriff.
 Paton, Andrew Hunter.....Ayr.
 Patterson, Arthur Colling.....Barnard Castle.
 Pearson, James Mills Southampton.
 Peverett, Stephen Walker ...Wisbech.
 Pike, Ernest James Edinburgh.
 Pinkerton, William Robert...Glasgow.
 Powell, Harold Dover.
 Poxon, Alfred.....Brownhills.
 Price, Edward George Birmingham.
 Pyecroft, Archibald Charles..Bradford.
 Ramsay, Alexander ... Manchester.
 Ransom, John Walter Wymondham.
 Rees, Samuel Thomas Llwyngollen.
 Rees, William.....Penybont.
 Reid, Charles Joseph Southampton.
 Rhodes, John C. Livingstone..Mirfield.
 Richardson, Arthur H. S.....Southampton.
 Ringer, Alick Archdale Wymondham.
 Rix, Henry Grey King's Lynn.
 Roberts, John Henry West ...Carnarvon.
 Robertson, F. Duncan Struan..Perth.
 Roe, Curtis Tate.....Chesterfield.
 Saint, Thomas.....Derby.
 Sant, Arthur William Tunstall.
 Sellers, Frederick William ..Coventry.
 Sewell, Arthur.....Stanwix.
 Sharp, Herbert Manchester.
 Shaw, Bertha Scarborough.
 Shaw, Vincent.....Huddersfield.
 Simmons, Stanley James Letheringsett.
 Simpson, Ogilvie Oxberry ...Newark.
 Skinner, John.....Burntisland.
 Skyrme, Harold Edgar...St. Arvans.
 Sleigh, John Lumsden Aberdeen.
 Slight, Franklin.....Nottingham.
 Smallley, Charles.....Halifax.
 Smith, Harold Saunders Horsham.
 Smith, James.....Lossiemouth.
 Smith, Richard Wallis.....Hornsey.
 Smith, Susan Amy.....Birmingham.
 Smorthwaite, Edward Alfred..London.
 Spence, William.....Kirkwall.
 Stevens, Norman Frederick...Fishpool.
 Stoker, Fred. Blyth.
 Stone, George Llanelly.
 Stonelake, Cecil Guernsey.
 Suckling, Ernest Frank Linton.
 Sunderland, Alfred Ernest ...Bradford.
 Sykes, Henry Vincent Honley.
 Taggart, Charles John Montrose.
 Tavendale, Peter Aberdeen.
 Taylor, Arthur Camden London.
 Taylor, William Edward Beccles.
 Thompson, Fredk. William..Southend.
 Thomson, George Lerwick.
 Thomson, James Fochabers.
 Thorne, William Henry Swindon.
 Tipper, Walter Utttoxeter.
 Tipping, Joseph.....Blackburn.
 Traherne, Whitlock Lewis ...Pembroke.
 Trenwith, Charles Cowley ...Bellahill.
 Twigg, John Thomas Matlock.
 Walters, John Thomas.....St. Clears.
 Warren, George Hope Bournemouth.
 Watt, Arthur Jas. Wingate..Burntisland.
 Watt, George Gordon Hingham.
 Wearing, John St. Just.
 Wells, William Wood Green.
 Welton, Edward George Norwich.
 Wheatley, William Arthur ..St. Helens.
 Wheildon, Harry Dursley.
 White, David Upper Weston.
 Wigginton, John H. Becher..St. Albans.
 Wilkinson, William Newcastle-on-Tyne.
 Willcocks, Edmund Squire...Fratton.

Williams, Constance Maude..Moseley.
 Williamson, George Macclesfield.
 Wilman, Gertrude.....Clayton.
 Wilson, Thomas Herbert.....Hull.
 Wood, Edward Vivian Manchester.
 Yates, Henry Henley Swinton.

The questions set at this examination were published in the *Pharmaceutical Journal* for July 14, p. 35.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result :—

Candidates.				Candidates.			
	Exam-ined.	Passed.	Failed.		Exam-ined.	Passed.	Failed.
Aberdeen	17	10	7	Jersey	1	0	1
Aberystwith.....	1	1	0	Kirkwall	2	1	1
Birmingham	36	19	17	Lancaster	4	1	3
Brighton	5	2	3	Leeds	22	12	10
Bristol	14	8	6	Lincoln	7	4	3
Cambridge	6	3	3	Liverpool	18	7	11
Canterbury	5	4	1	London	42	15	27
Cardiff	7	3	4	Manchester	43	20	23
Carlisle	19	7	12	Newcastle-on-T. ..	18	12	6
Carmarthen	16	11	5	Northampton ..	2	1	1
Carnarvon	7	3	4	Norwich	14	9	5
Cheltenham	3	2	1	Nottingham.....	17	7	10
Darlington	13	7	6	Oxford	3	0	3
Douglas	5	3	2	Penzance	6	2	4
Dundee	14	8	6	Peterborough ..	6	5	1
Edinburgh	29	11	18	Plymouth	7	2	5
Exeter	6	0	6	Sheffield	9	6	3
Glasgow	25	12	13	Shrewsbury	2	0	2
Guernsey	3	1	2	Southampton ...	16	9	7
Hull	7	3	4	Worcester	1	0	1
Inverness	5	3	2	York	7	3	4

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination :—

Brunyee, Nathaniel.....Thorne.
 Cottman, Thomas Dorchester.
 Cowling, Ernest Wallingford.
 Davies, Harry Wrexham.
 Denwood, George Davidson ..Carlisle.
 Francis, Thomas.....Milford Haven.
 Gayton, Ethel Hampstead.
 Glover, Charles Crofts Ashby de la Zouch.
 Greaves, Alfred Ellis.....Boscombe.
 Hogarth, John Tom Choppington.
 Jeffs, Richard Thomas Gloucester.
 Jones, Joseph New Bushey.
 Knowles, Charles John Forest Gate.
 Matthews, Albert J. Pontypridd.
 Morris, William Llanarmon.
 Newall, David.....Dalbeattie.
 Phoenix, Herbert.....Wrexham.
 Pickford, Arthur Ferdinand..Kennington.
 Pollard, Evelyn William ...Ryde.
 Ricardon, Joseph Marius London.
 Stevenson, Charles Harry Ross.
 Tasker, Dudley Bayzand London.
 Thompson, Sarah Bilston.
 Tonkin, John Kenyon.....Guisborough.
 Woodward, John William ...Utttoxeter.
 Younghusband, Wm. Henry...Kennington.

EXAMINATIONS IN EDINBURGH.

July, 1894.

MINOR EXAMINATION—PASS LIST.

Candidates examined	137
„ failed	80
„ passed	57

Allen, John Wilfred	Douglas.
Arundel, Edmund	Manchester.
Beachell, John	York.
Bickle, William John	Newport Pagnell.
Bradford, James	Edinburgh.
Burgess, Frederick William	Wigan.
Burnett, Charles Johnson	Dufftown.
Clay, Arthur	Leeds.
Comrie, William Reed	Gravesend.
Craig, William Reid	London.
Dalkin, Thomas	Sheffield.
Dent, John	Manchester.
Fairweather, James Young	Forfar.
Forbes, Charles	Aberdeen.
Forbes, John Johnston	Buckie.
Garbutt, Charles Holmes	Shildon.
Handley, John Wm. Peter	Rochdale.
Harper, Theophilus	Belfast.
Hay, William Fowlie	Aberdeen.
Hirst, Edward	Savile Town.
Hollingworth, Oliver Albert	Barnsley.
Innes, James	Glasgow.
Innes, Richard Langlands	Dumbarton.
Keinch, John Thomas	Bolton.
Kitchin, George Shiach	Banff.
McCutcheon, David	Maybole.
McKenzie, Alex. Thomas	London.
Milne, Alexander	Stonhaven.
Mitchell, Donald	Inverness.
Mitchell, William	Hyde.
Murray, Alexander	Edinburgh.
Napper, Ernest Henry	Manchester.
Openshaw, John Wm. Walker	Lower Darwen.
Parry, Lewis	Liverpool.
Paterson, Alexander	Edinburgh.
Paterson, Andrew John K.	Dundee.
Pirie, George Finlayson	Arbroath.
Reid, Alexander	Aberdeen.
Richardson, Sylvester	Reading.
Robinson, Edward George	Lincoln.
Rook, Moses	Maryport.
Rothwell, William Thomas	Radcliffe.
Rowland, Sidney Comberbach	Wrexham.
Sanley, Edward Thompson	Littleborough.
Smith, William	Edinburgh.
Somerville, George	Edinburgh.
Stoddart, Thomas	Todmorden.
Strother, Alfred Emmerson	Newcastle-on-Tyne.
Stattard, Thomas	Burnley.
Sutherland, John George	Sunderland.
Symington, James Martin	Maryport.
Turner, Calvert Daykin	Alfreton.
Walburn, Arthur William	West Hartlepool.
Warnock, William Scott	Helenburgh.
Williamson, Andrew Arthur	Edinburgh.
Wilson, James Munro	Auchmill.
Young, James Clements	Manchester.

SCHOOL OF PHARMACY PRIZES
EXAMINATION QUESTIONS.

Session 1893-94.

PHARMACY AND PRACTICAL PHARMACY.

MR. INCE.

Monday, July 23.—Hours from 10 to 1.

1. Write dispensing note on (a) manna; (b) gallic acid; and (c) suppositories of belladonna, indicating necessary precautions.

2. Describe the process of granulation as applied to official and other preparations, noting conditions essential to success.

3. Comment on (1) glycerinum plumbi subacetatis; (2) emplastrum mentholis; (3) enema magnesii sulphatis; and (4) unguentum hydrargyri nitratis.

4. Give technical Latin for:—Spread on leather; heartburn; headache; the nape of the neck; an hour or so; five drops only.

MATERIA MEDICA.

PROFESSOR HENRY G. GREENISH.

Monday, July 23.—Hours from 2 to 5.

[Four Questions only to be attempted.]

1. Discuss the formation of resins, selecting illustrations from the official resins, if possible.

2. What do you understand by the term "essential oil?" Give illustrations of bodies included and excluded. What is the qualitative composition of essential oil of clove, cinnamon, eucalyptus, lavender? Suggest and explain methods for their approximate valuation.

3. From what drug would you propose to isolate hyoscyamine? Give reasons for your selection. Describe in detail the process you would adopt, and give full reasons for each step. In what other drugs does the same alkaloid occur?

4. Compare the constituents of black catechu with those of pale catechu and kino. Explain the relations (if any) that exist between the constituents of each individual drug. Suggest a means for improving the quality of black catechu, and give the grounds upon which the suggestion is based.

5. Describe all the varieties of benzoin with which you are acquainted. Compare them physically and chemically. Give the results of recent work on the chemistry of these resins, and the conclusions to be drawn from them.

6. Describe minutely the characters by which you would recognise the official jaborandi leaves. With what substitutes are you acquainted? State carefully the physical characters that enable you to identify each, and, if possible, its geographical source and relative alkaloidal value.

BOTANY.

PROFESSOR REYNOLDS GREEN.

Tuesday, July 24.—Hours from 10 to 1.

[Only three Questions to be answered.]

1. Give an account of the various reproductive cells found in plants. Distinguish between the sexual and the asexual forms.

2. A potato is grown in a dark cellar, without being planted in earth, but being surrounded by moist air. Describe the features the plant will present, and explain them as fully as you can.

3. Describe the changes that may be observed in the cortex of a stem as it increases in thickness. How do you explain the shedding of the bark in the plane tree?

4. Give as concisely as you can a sketch of the De Candolle system of classification. Point out its advantages and defects.

PRACTICAL BOTANY.

PROFESSOR REYNOLDS GREEN.

Tuesday, July 24.—Hours from 2 to 5.

1. Investigate the structure of specimen A. Make preparations of such parts as you consider important, and leave with them lettered explanations.

2. Identify and briefly describe the three microscopic preparations B. C. D.
3. Refer the flowers E. F. G. to their natural orders, giving briefly the reasons for your assignment.

COUNCIL PRIZES EXAMINATION QUESTIONS.

July 25, 1894.

BOTANY AND MATERIA MEDICA.

Time—10 a.m. to 1 p.m.

BOTANY.

1. Give in a concise manner a descriptive tabulated classification of fruits.
2. Define the following terms:—Abaxile embryo, campylotropous ovule, anthela, dichasium, arillus, gynophore, heterocyst, pseudo-bulb.
3. What influence does the action of light have on the growth of plants?
4. Describe the bordered pitted cells of Coniferae.

MATERIA MEDICA.

1. Give an account of the alkaloidal constituents of *Aconitum napellus*, and state how aconitine and isaconitine are separated from the plant, and distinguished from each other.
2. Describe the varieties of ipecacuanha as met with in commerce, and how the genuine may be distinguished from the spurious. Give the percentage of emetine where present.
3. Give the names, natural orders, and habitats of plants yielding the official oleo-resins.
4. How is the essential oil of bitter almonds formed? What other bodies are produced, and in what manner may the oil be freed from such? Give the tests which distinguish from nitro-benzol.

CHEMISTRY.

Time—2 to 5 p.m.

1. Mention any weak points you have detected in the usual definitions of an acid.
2. Give the formulae and methods for preparing triethyl stibine and stibethyl oxide.
3. What is the result of the action of solution of potassium permanganate on methyl-propyl-carbinol? Give formulae.
4. What is the action of nascent hydrogen on itaconic, citraconic, and mesaconic acids, respectively? Give formulae.
5. Give the graphic formulae of hydroquinone, salicylic acid, and phthalic acid.
6. How many oxides of bismuth are known? Give a method for the preparation of bismuth dioxide in "the wet way."

Proceedings of Societies in London.

INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND.

At the examination in Practical Chemistry for admission to the Membership of this Institute, held at the laboratories at 30, Bloomsbury Square, from July 2 to 5, twenty-seven candidates presented themselves, of whom the following seventeen were successful:—A. Adams (trained at Mason College, Birmingham); H. Bowes (Assistant to W. Thomson, F.I.C.); B. S. Bull (Christchurch University, New Zealand); O. F. C. Block (Finsbury Technical College, and student under J. Hodgkin, F.I.C.); W. C. Carter (Finsbury Technical College); W. Crossley (Royal College of Science, Dublin); W. R. Hardwick and J. Harger (University College, Liverpool); J. A. Hat-

field (Mason College, Birmingham); G. H. Perry (Royal College of Science, London); W. Ralston (Glasgow and West of Scotland Technical College); A. Roes and H. C. Seabrooke (Finsbury Technical College); T. C. Sharrott (Mason College, Birmingham, and Royal College of Science, London); E. A. Warmington (Mason College, Birmingham, and Leipzig University); and J. T. Whitton (Glasgow and West of Scotland Technical College). The Examiners were Professor Wyndham R. Dunstan, M.A., F.R.S., F.I.C., and Mr. Thomas Fairley, F.R.S.E., F.I.C. The Members of the Institute now number over 850, and there are over 200 registered students.

Provincial Transactions.

MIDLAND PHARMACEUTICAL ASSOCIATION.

The following have been elected officers of this Association for the ensuing year:—

President, Mr. R. D. Gibbs; Vice-Presidents, Mr. W. Jones and Mr. F. J. Gibson; Hon. Treasurer, Mr. F. Prosser; Hon. Librarian, Mr. F. H. Alcock; Hon. Auditors, Mr. W. Churchill and Mr. T. Chase; Hon. Secretary, Mr. G. E. Perry.

The following have been appointed Delegates to the British Pharmaceutical Conference at Oxford:—Messrs. R. D. Gibbs, C. Thompson, H. Hutton, F. H. Alcock, A. Southall, F. Prosser, C. F. Jarvis, J. Barclay, F. J. Gibson, and G. E. Perry.

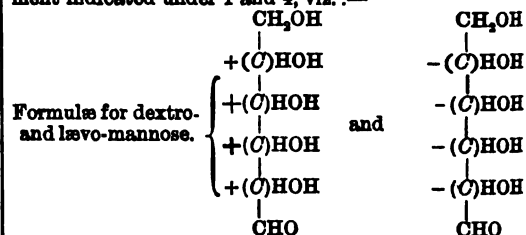
NORTH OF ENGLAND INSTITUTE OF TECHNICAL BREWING.

THE POLARISCOPE IN RELATION TO CHEMICAL CONSTITUTION.*

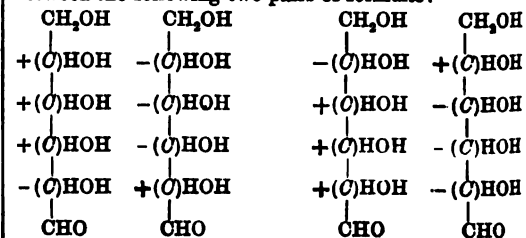
BY PERCY FRANKLAND, PH.D., B.SC. (LOND.), F.R.S.,
Now Professor of Chemistry and Metallurgy at Mason's
College, Birmingham.

(Concluded from vol. lili., page 1080).

But not only have these numerous isomers been already prepared, but in some cases it has actually been found possible to identify particular isomers with the formulae in the above diagram. Thus, by a most admirable process of close reasoning, into the details of which I have not time to enter, Emil Fischer has shown that the two mannoses must have the arrangement indicated under 1 and 4, viz. :—



whilst in the case of the dextro- and lævo-glucoses proper he has similarly shown that we must select between the following two pairs of formulae:—



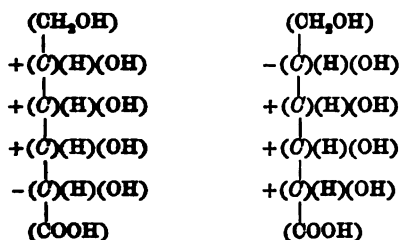
* Reprinted from the *Chemical News*.

Now it is here that the whole theory has been put to a most crucial test, and the brilliantly successful manner in which it has passed through this ordeal has enormously increased our confidence in its adequacy and usefulness.

Thus the above formulæ indicate that there should be another sugar having exactly the same constitution as glucose, with the exception of the CH_2OH and COH groups being inverted. Now such a sugar has actually been artificially prepared by Fischer, for it is not known to exist in nature, and he has given to it the name of "gulose," an appellation chosen in order to indicate its close relationship to glucose.

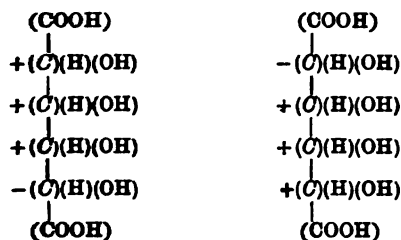
I will briefly sketch the evidence upon which our knowledge of this remarkable relationship is based, thus:—

1. By gentle oxidation of a sugar of the glucose type the COH group can be converted into a COOH group. When subjected to this treatment glucose and gulose yield two distinct acids, gluconic and gulonic acids respectively, as should be the case assuming the correctness of the above formulæ:—



Formulæ showing the distinction between gluconic and gulonic acids.

2. By the further oxidation of such an acid it is possible to convert the CH_2OH group into a COOH group also, and by applying this treatment to gluconic and gulonic acids respectively, it is found that the product obtained from each is the same, viz., saccharic acid, in precise accordance with what we should be led to anticipate from a consideration of our formulæ:—



Formulæ exhibiting the identity of the saccharic acid obtained from either glucose or gulose respectively.

In the following table I have collected the names of all the sugars at present known, and from this it will be seen how greatly the list has been swollen through these classical researches of Emil Fischer, of which I have been endeavouring to give you some account.

Sugars of the Glucose Type.

	<i>Triose.</i>
$\text{C}_3\text{H}_5\text{O}_3$	Glyceroose.
	<i>Tetrose.</i>
$\text{C}_4\text{H}_7\text{O}_4$	Erythroose.
	<i>Pentose.</i>
$\text{C}_5\text{H}_{11}\text{O}_5$	Arabinose.*
	Xylose.*
	Ribose.
	Rhamnose.* ($\text{CH}_2\text{C}_5\text{H}_9\text{O}_5$).

	<i>Hexose.</i>
$\text{C}_6\text{H}_{12}\text{O}_6$	Glucose, d, l, i .
	Mannose, d, l, i .
	Fructose, d, l, i .
	Gulose, d, l, i .
	Galactose, d, l, i .
	Sorbinose.*
	B-Acrose.
	<i>Heptose.</i>
$\text{C}_7\text{H}_{14}\text{O}_7$	Mannoheptose.
	Glucoheptose.
	Galaheptose.
	Fructoheptose.
	Rhamnoheptose ($\text{CH}_2\text{C}_7\text{H}_{12}\text{O}_7$)
	<i>Octose.</i>
$\text{C}_8\text{H}_{16}\text{O}_8$	Mannoctose.
	Glucooctose.
	<i>Nonose.</i>
$\text{C}_9\text{H}_{18}\text{O}_9$	Mannononose.

N.B.—In the above Table, d =dextrorotary, l =levorotary, i =inactive. With the exception of those marked * all the above sugars have been discovered by Emil Fischer.

I think it must be admitted that it would be almost impossible to produce more convincing evidence of the enormous power which is conferred upon the investigator by the possession of a carefully framed theory, and when this theory touches some of the most invaluable substances which occur on our earth and leads to their artificial production by the hand of man, it should be possible also for the general public to realise, however faintly, the national duty of encouraging and fostering in every way possible the development of this mighty engine of pure scientific research.

Recent Additions to our Knowledge of Asymmetric Carbon Atoms.

Speculation concerning the asymmetric carbon atom and the optical activity to which it gives rise has, however, recently been carried still further.

All who have used the polarimeter are aware that different active substances rotate the plane of polarisation through different angles, and the apparently anomalous circumstance is not unfrequently observed of a simple derivative of an active substance rotating the plane of polarisation in the opposite direction to that of the parent substance. This phenomenon is well exhibited by the following series.

	$[\alpha]_D$.
Diacetyltartaric acid	-23.14°
Methyl salt of diacetyltartaric acid	-14.29
Ethyl " " "	+1.02
Propyl " " "	+6.52
Isobutyl " " "	+10.29

A most ingenious attempt has recently been made by Crum Brown and Guye to account for these quantitative relations between the rotatory power of different substances by taking into consideration the respective weights of the four groups which are attached to the asymmetric carbon atoms, and arguing that the more nearly equal in weight two of these groups become, the more nearly will optical inactivity be approached, whilst the greater the disparity in weight of the groups, the greater should the activity be.

These points are exemplified by a series of derivatives of active glyceric acid which I have recently prepared in conjunction with Mr. John MacGregor, and exhibit the follow rotations:—

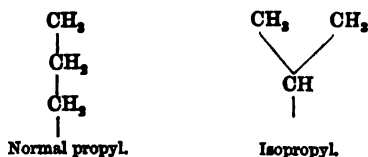
Weights of groups attached to asymmetric carbon atom.	Specific rotation $[\alpha]$.
---	--------------------------------

Methyl glycerate $\text{H}=1, \text{HO}=17, \text{CH}_2\text{OH}=31, -4.80^\circ$
 $\text{OOCH}_3=59.$

Ethyl glycerate	H=1, HO=17, CH ₂ OH=81, - 9.18 COOC ₂ H ₅ =73.
Propyl (normal) glycerate	H=1, HO=17, CH ₂ OH=81, - 12.94 COOC ₃ H ₇ =87.
Butyl (normal) glycerate	H=1, HO=17, CH ₂ OH=81, - 13.19 COOC ₄ H ₉ =101.

Thus, whilst three out of the four groups attached to the asymmetric carbon atom remain constant, the fourth group increases in weight from 59 to 73 to 87 to 101, concurrently with which increase the rotatory power increases also.

In order to put this theory to the test it is obviously of interest to ascertain what is the effect of replacing one of these groups by another group of equal weight; thus, in the series above, in addition to normal propyl glycerate, we have also prepared isopropyl glycerate, and found its specific rotation to be less than that of the normal, viz., -11° 82. Thus it would appear that the masses of the groups are not necessarily attached directly to the corners of the tetrahedron, but that the centres of gravity of the groups may be at different distances from the corners of the tetrahedron depending upon the internal structure of the groups themselves. Thus, in the case in point this difference in the distance of the centres of gravity of the normal and isopropyl groups is plausibly explicable on the generally acknowledged views concerning their structure; thus the material interpretation of the formulae:—



would indicate that the centre of gravity of the normal propyl should be further from the point of attachment than that of the isopropyl.

There are, however, other cases which find no such ready explanation by this theory, and which lead us to conclude that the theory will have to be materially modified before it embraces all known facts. Thus I have recently prepared in conjunction with Mr. MacGregor the following derivatives of active glyceric acid, which exhibit some very interesting relations:—

Methyl glycerate—	
1. H=1. 2. HO=17. 3. CH ₂ OH=31. 4. CH ₂ O.CO=59.	-4.80°
Methyl diacetyl glycerate—	
1. H=1. 2. CH ₃ CO.O=59. 3. CH ₃ CO.OCH ₃ =73. 4. CH ₂ O.CO=59.	-12.04
Ethyl diacetyl glycerate—	
1. H=1. 2. CH ₃ CO.O=59. 3. CH ₃ CO.OCH ₃ =73. 4. CH ₃ CH ₂ O.CO=73.	-16.31
Propyl diacetyl glycerate—	
1. H=1. 2. CH ₃ CO.O=59. 3. CH ₃ CO.OCH ₃ =73. 4. CH ₃ CH ₂ CH ₂ O.CO=87.	-19.47
Isobutyl diacetyl glycerate—	
1. H=1. 2. CH ₃ CO.O=59. 3. CH ₃ CO.OCH ₃ =73. 4. $\begin{array}{c} \text{CH}_3 \\ \diagdown \quad \diagup \\ \text{CH} \end{array}$ O.CO=101.	-20.48

In this series it will be seen that we have the most interesting relationships between the masses or weights of the groups attached to the asymmetric carbon atoms. Thus we start with a compound in which all the groups are of different weight, and in the order:—

(1) < (2) < (3) < (4)
this is followed by—
(1) < (2) = (4) < (3)
upon which follows—
(1) < (2) < (3) = (4)
and then—
(1) < (2) < (3) < (4)
and again—
(1) < (2) < (3) < (4)

but notwithstanding that the two groups, (2) and (4), are of equal mass in methyl diacetyl glycerate, and the two groups, (3) and (4), in ethyl diacetyl glycerate, yet neither of these compounds even approaches inactivity, nor is there any change of sign or direction in the activity exhibited by this series of compounds.

It is evident, therefore, that this more recent extension of the theory of the asymmetric carbon atom has not yet been so formulated as to fully explain all the known facts. This further development of the theory is, in fact, in that most interesting phase of its evolution, when each new investigation bearing on it is eagerly awaited, to see in how far it will support and strengthen the hypothesis, and in what it will require its change and correction. This is indeed the great value of theoretical speculation, that it stimulates investigations and researches which would otherwise have possibly never been made at all, and in this way leads to the earlier and more rapid discovery of all that is true, lasting, and irrefragable.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

ACTION AGAINST AN UNREGISTERED ASSISTANT.

On Wednesday, July 18, at the County Court of St. Helens, Lancashire, before his Honour Judge Shand, an action was brought on behalf of the Council of the Pharmaceutical Society of Great Britain, by Mr. Richard Bremridge, the Registrar of the said Society, against John Ernest Edington, assistant at the World's Drug Stores, 135, Westfield Street, St. Helens, to recover £5, the penalty for a breach of the Pharmacy Act, 1868. Mr. T. R. Grey, barrister, instructed by Messrs. Flux, Thompson, and Flux, of London, appeared on behalf of the Society, and Mr. H. L. Riley solicitor, defended.

Mr. Grey, in opening the case, said this was an action for a penalty for the sale of poison contrary to the Pharmacy Act, 1868. The defendant was the assistant to a registered chemist, who carried on business at 135, Westfield Street, and on May 31 he sold a bottle of Dr. Collis Browne's chlorodyne, that would be proved before his Honour to contain about three-quarters or more of a grain of morphine, which was a poison under the schedule of the Act 31 and 32 Vic., chap. 121. Section 1 made it unlawful for any person to sell or keep open a shop or dispensary for compounding poisons unless he was registered under the Act. Section 2 says that the several articles described in the schedule shall be deemed to be poisons within the meaning of the Act, and his Honour would find on page 24 of the schedule that preparations of morphine were included. The last part of section 2 said that the Society had power to add to the schedule, with the consent of the Privy Council. There were two sections which he would call his Honour's attention to, the first being section 15, which was the section on which they sued that day. That section stated that any person who shall sell or keep an open shop for the retailing, dispensing, or compounding poisons, not being a duly registered pharmaceutical chemist, or chemist and druggist, shall for

every such offence be liable to pay the penalty or sum of £5, which sum may be sued for, recovered and dealt with in the manner provided by the Pharmacy Act, 1852. Then section 12 of 15 and 16 Vict., said that such penalty may be recovered by the Registrar appointed under the Act in England and Wales by suit in the County Court. Then he need only call his Honour's attention to two cases, the first being the *Pharmaceutical Society v. Piper*, in which this very substance, chlorodyne—from one of Collis Browne's bottles—was sold, and it was held that the prohibition of the Act against the sale of poison by other than registered chemists extended not only to the sale of scheduled poisons in their simple state, but to the sale of compounds, and that chlorodyne was a poison under the Act, and it was also further held that it was not a patent medicine. The only other case that he would refer to was the *Pharmaceutical Society v. Wheeldon*, before Mr. Justice Hawkins, where it was held that when an unregistered chemist's assistant in the absence of his master sells any poison or preparation containing poison, he is under the Act defined as liable to the penalty under the section, notwithstanding that he effects such sale on behalf of his master, and that his master is duly registered. In that case, speaking of the object of the Act of 1868, Mr. Justice Hawkins says: "Nothing to our understandings can be clearer than that the object of the Act was beyond all other considerations to provide for the safety of the public, and to guard as far as possible all members of the community from the disastrous consequences so frequently arising from the sale of poison by persons inadequately acquainted with their baneful properties, and the whole object of the Act would be frittered away, and the Act itself become a dead letter were we to declare by our judgment that an unqualified assistant can lawfully and with impunity sell any of the poisons to which the Act applies, unless upon each occasion of such sale he acts under personal superintendence of a qualified employer or qualified assistant to such employer. By such personal superintendence we mean not mere presence in the shop or room where the sale takes place, but actual personal superintendence, so that every individual sale shall be so guarded round by these precautions prescribed by the Act that the safety of every member of the public may be provided for as far as the law can accomplish that object." He would not trouble his Honour any further, but would call the witnesses.

Arthur Foulds said: I am an agent, and reside at Salford. On May 31 last I went to 135, Westfield Street, St. Helens. I purchased a bottle of Collis Browne's chlorodyne. That is the bottle (produced) that I bought. It was in that wrapper, and there was a stamp over the cork. Ernest Edington served me. I paid him 10½d. for it. No one else was in the shop. I afterwards handed it over to Mr. Moon.

Mr. Riley (cross-examining): What are you?—An inquiry agent.

For this Society?—Not for this Society in particular.

And as part of the method to get this compound did you ask Mr. Edington whether he could oblige Mr. Wallbridge with a bottle of Collis Browne's chlorodyne?—No.

Who is Mr. Wallbridge?—I do not know.

Did you mention the name of a local chemist as having sent you?—No.

Will you say how you got this at wholesale price, 20½d., instead of 13½d.?—I do not know. I got a pennyworth of camphorated chalk and a bottle of Collis Browne's chlorodyne, and he charged me 11½d. for the two.

Had you been in communication with any local chemist?—No.

Then what had directed your attention to St. Helens, and this shop in particular?—I was instructed to visit it by the Pharmaceutical Society.

And you do not know whether they had been in communication with any local chemist?—I do not.

When you asked for it did Mr. Edington come round to the case where the proprietary articles are kept?—Yes.

Did he then go behind the counter and into the workroom attached to the shop?—No; he never left the shop. I took particular notice.

Was there not his younger brother in the shop?—No.

Look round the court and see if you see the defendant.—He is there.

And was not the young man in front of him there as well?—No.

Harry Moon, clerk in the office of the Registrar of the Society, said: On June 7 last I received a packet from the last witness. That is the bottle that was in it. I gave it on July 13 to Mr. Eastes for analysis.

Arthur John Eastes, analyst and Fellow of the Institute of Chemistry, said: On July 13 I received from the last witness a bottle of Dr. Collis Browne's chlorodyne, and that is the bottle. It was fastened up with the Inland Revenue stamp when I received it. I carefully analysed the contents of the bottle and found morphine in it. The quantity of morphine was two grains to the fluid ounce. The bottle contained about three fluid drachms or three-eighths of an ounce, and the actual quantity of morphine in the bottle was three-quarters of a grain. The quantity of morphine in the bottle is enough to kill an adult.

Mr. Riley: I suppose you have often examined this chlorodyne?—Yes; many times.

It is fairly uniform in its quantities?—Yes, it is.

And the directions that are given are sufficient if a person is using it intelligently to avoid this catastrophe of which you have spoken of as possible?—If they follow the directions, yes.

Mr. Grey: That is the case. I simply put the Register in as evidence that he is not registered.

His Honour: That is admitted.

Mr. Riley then addressed the court, and said that his defence would be limited to the question whether or not defendant did break the law in the course of his selling the chlorodyne. They raised no question as to whether it was or was not a poisonous compound. He thought it as well that the witnesses for the prosecution should be called, in order that they might hear all about it. They had heard how the chlorodyne came to the retailer as a completed preparation, so that the care which would need to be exercised, whether by a registered or unregistered person, was obviously not the same as if he were compounding something from his own drug bottles, and were having to apply his intelligence to the matter whether or not it was properly done, so that the application of the dictum of Mr. Justice Hawkins as to the necessity of protecting the public was very much detracted from by that fact. If he showed his Honour that there was on the premises a registered practitioner, to whom the premises belonged, and if the assistant took the bottle from the case and asked his master if he would oblige so and so by letting him have it, he would thus prove that the assistant was acting under the personal superintendence of a qualified employer. Mr. Edington, who was the son of a gentleman who was formerly in business in St. Helens as a chemist, was an assistant to Mr. Peter Webster Harrison, and he would prove that he was on this day in the shop with his younger brother, and that when Foulds came he asked Mr. Harrison if he might let Mr. Wallbridge have the chlorodyne. Having only taken possession of the shop ten days before he went round to the case to see if there was any chlorodyne in stock,

and then took it to his master. That would be sworn to by three witnesses of undoubted respectability, and he thought that his Honour would decide that the sale took place under the direct superintendence of a qualified person.

The defendant was then called and said: My name is John Ernest Edington. I was formerly with my father, who was for many years in business as a chemist.

His Honour: I do not think I have any power to mitigate the penalty, whether the man is a respectable one or not, so that does not matter.

Mr. Riley: I thought it was a circumstance that went more to character.

His Honour: Perhaps you are right.

Defendant continuing: On May 31 I was on the premises of Mr. Harrison, who carried on business in Westfield Street under the name of the World's Drug Stores. I believe the business had been carried on up to a few days before by Mr. Alexander Fraser, a registered chemist. I remember Mr. Foulds calling at the stores. At the time he came in I was in the shop and my brother was behind the case. His name is Samuel Percy Edington. Adjoining the shop there is a working room, and Mr. Harrison was there at the bench. When Mr. Foulds came in he said, "Can you let Mr. Wallbridge have a bottle of Collis Browne's chlorodyne?" and I said "I will see if we have got it?" I took out the key from my pocket and went to the case and saw two bottles. I took one out and went round the counter. The case is on the front of the counter. You have to go to the front of the counter to open it, and the counter is pretty well covered with it. Then I went into the room and said to Mr. Harrison, "Can I let Mr. Wallbridge have a bottle of Dr. Collis Browne's chlorodyne?" He replied "Yes," when I said "What will you charge him for it?" He said 10½d., that being 1½d. lower than he generally sold it. I came back from the inner room and told him he could have it, and what the price was. He paid me the 10½d. I do not remember him buying anything else. I entered the sales in a book.

Cross-examined by Mr. Grey: He remembered selling the bottle of chlorodyne to Foulds, but not the camphorated chalk, but if that was entered in the sales book then he must have sold it.

His Honour: Did you know that chlorodyne is poison?

Witness: Yes, I have made gallons of it.

His Honour: What kind of a case is this that you say your brother was behind?

Witness: It is a high case, and there are show cards on the top of it. It hides the door of the working room.

Samuel Percy Edington said: I have been employed for some time by Mr. Harrison as a traveller. I remember that when the first witness came to the shop and asked if Mr. Harrison could oblige Mr. Wallbridge with a bottle of chlorodyne, my brother went round to the case and got the bottle, and took it to Mr. Harrison. I was at the shop from nine o'clock in the morning till half-past two, and it was during that time that the transaction took place. Mr. Harrison was doing some chemical analysis in the other room.

By Mr. Grey: He did not know whose name was upon the shop front at the time, but Mr. Harrison's was not. The reason he knew it was Mr. Foulds that got the bottle of chlorodyne was that he was the only customer in the shop at the time, and he saw his back when he went out.

Peter Webster Harrison said: I am a registered chemist. On May 21 my firm acquired the business of the World's Drug Stores. My business and qualification is that of a chemical analyst. On that day I had occasion to be in the room attached to the shop from ten o'clock to half-past twelve. On that day also Mr. John Ernest Edington was engaged as an assistant

to me, and at the time I engaged him I told him that he must not on any account sell any poisons unless shown to me personally. I remember during the morning he came and asked me whether I would oblige Mr. Wallbridge with a bottle of Collis Browne's chlorodyne. I said "Yes," and he asked me what price I would charge him for it, and I said 10½d. If I had not thought it was to oblige a fellow chemist I should have asked 1s. I took two bottles of chlorodyne over with the stock. One has been sold, and the other is still there.

Mr. Grey subjected witness to a long and searching cross-examination in order to shake his testimony, but he still adhered to the statement that the chlorodyne was shown to him before it was sold.

Mr. Grey: Was not Alice Jones in your employ last year at Prescot?

Witness: No, Agnes Jones was employed there as an apprentice.

Mr. Grey: And she sold oxalic acid?

Witness: Yes.

Mr. Grey: And you had to pay a penalty in this court last year.

Witness: No, we were not responsible. She was fined.

Mr. Riley: In reference to the case of Agnes Jones that has been brought up, at the shop at Prescot you had at that time a registered assistant?

Witness: Yes.

His Honour: We are not trying that.

Mr. Riley: That has been brought in to prejudice Mr. Harrison.

Mr. Grey: In what way?

Mr. Riley: Because the assistant was away getting his tea, and the girl sold some oxalic acid to a neighbour.

Mr. Grey: And the neighbour died.

His Honour: Have you a qualified practitioner at your shop at Boundary Road?

Witness: I am there myself.

His Honour: And you have only one qualified person between two shops?

Witness: Yes.

His Honour: Suppose a person comes to the Westfield Street shop, what happens?

Witness: They send to Boundary Road, three minutes' away, for me.

His Honour: Is that going on still?

Witness: Yes.

His Honour: Now what things do you insist on the assistant sending over to you for?

Witness: For all articles that are under the Pharmacy Act, and always to dispense any prescriptions that come in.

Mr. Riley then addressed his Honour, and contended that on the evidence the verdict must be for defendant.

Mr. Grey, for the plaintiff society, asked his Honour not to believe the witnesses for the defence. The transaction was quite unknown to Mr. Wallbridge, and the witnesses said that Foulds used Wallbridge's name though he had sworn that he did not know and had never heard of Mr. Wallbridge.

Foulds was recalled, and re-affirmed his statement that Edington never went out of the shop, and also said that the screen or case on the counter was a small one.

His Honour said he thought it was perfectly right that the Pharmaceutical Society should take proceedings in all cases, even of doubt, but he was not going to convict a man—for it was practically a conviction unless it was abundantly clear that the Act had been transgressed. If there was a doubt in his mind he thought he ought not to convict. He was not at all satisfied that there had been an offence. He thought there might be a mistake. When they found that the door to the inner room was screened off from the shop he was not at all certain that defendant might

have gone in. If he did, the sale was under the personal supervision of Mr. Harrison. It was for the Society to prove that the sale was not under Mr. Harrison's supervision, and that had not been done. It was practically a criminal case, and it was perfectly right that anybody who transgressed the Act should be punished, and punished severely, but he must be fully satisfied that wrong had been done before he convicted. To his mind an offence had not been made out. He therefore gave judgment for defendant, with costs.

SALE OF CHLORODYNE BY AN UNREGISTERED ASSISTANT.

At the County Court, held at Manchester, July 25, 1894, before his Honour, Judge Parry, the Pharmaceutical Society of Great Britain sued Arthur Stevenson, of 95, Butler Street, Manchester, for £5, the penalty for a breach of the Pharmacy Act, 1868. Mr. T. R. Grey, instructed by Messrs. Flux, Thompson and Flux, appeared for the plaintiff Society. Defendant was not represented.

Mr. Grey announced that he had that morning received a letter, in which the defendant stated that he had no intention of disputing his liability to pay the penalty. The judge, however, desired that Mr. Grey would prove his case. The learned counsel said that the defendant was an unqualified assistant to a chemist and druggist, and manager of a branch business, and he had sold, on April 14 of this year, a bottle of chlorodyne containing a poison, to wit, morphine, contrary to the provisions of the Act 31 and 32 Vict., cap. 121.

Mr. Grey then explained the provisions of the Act, and directed his Honour's attention to the judgments pronounced in the higher courts in the cases of *Pharmaceutical Society v. Piper* and *Pharmaceutical Society v. Armon*.

In reply to a question by his Honour on the case of the *Pharmaceutical Society v. Delves*, tried in the Manchester County Court last year, Mr. Grey said that that case was decided against the plaintiff Society because no evidence was offered regarding the quantity of poison present in the article—"licoridine." That question would not arise on this occasion because the analyst would prove that there was nearly one grain of morphine present in the article upon the sale of which the present action was instituted.

Mr. Arthur Foulds, private enquiry agent, stated that on April 14 last he went to the shop at 95, Butler Street. It was a chemist's shop. The name over the door and on the labels was J. L. Smith. He asked for chlorodyne, which was supplied to him. He was served by Arthur Stevenson. There was no one else in the shop. He retained the bottle in his possession until May 29, when he handed it to Mr. Moon.

Mr. Harry Moon, clerk in the office of the Pharmaceutical Society, deposed that he had received the bottle from the last witness, and afterwards gave it to the analyst.

Mr. Ernest J. Eastes, F.I.C., Demonstrator of Practical Chemistry and assistant to Professor Atfield, stated that he had analysed the contents of the bottle produced. It contained three-quarters of an ounce of chlorodyne. He found in it fifteen sixteenths of a grain of morphine. This was a decidedly dangerous quantity.

Mr. Grey then read Mr. Justice Hawkins's judgment in the case of *Pharmaceutical Society v. Wheeldon*, which was a parallel case with this.

His Honour gave judgment for plaintiffs for £5, with

POISONING CASES AND INQUESTS.

POISONS AT HOSPITALS.

Dr. G. Danford Thomas held an inquest on July 18, at the Marylebone Coroner's Court, on the body of Mary Hope Blake, the child of a domestic servant, who died from carbolic acid poisoning. Miss Amelia Frances McCord, matron at Queen Charlotte's Lying-in Hospital, Marylebone Road, said the child was a few days old. On Friday evening Nurse Reynolds informed the witness that she had given the deceased some carbolic acid in mistake for olive oil. The witnesses at once took the child to Dr. Lee, one of the house surgeons, under whose care it remained until it died early on Monday morning. The bottles of medicine were kept in a cupboard in the ward in charge of Nurse Bose, the sister of the floor. The bottles being empty were taken down to be filled. Sister Alice Beedie, finding some time afterwards that the house surgeon had not filled the bottles, filled them herself and replaced them in the cupboard or locker. In filling the bottles Sister Beedie had filled a chemist's stock bottle, labelled "Olive Oil," with carbolic acid. Olive oil and carbolic acid bottles were alike in colour—dark blue—and of a similar size. Nurse Reynolds got hold of the bottle labelled "Olive Oil," but containing carbolic acid, and administered a teaspoonful of the acid to the deceased child in mistake for olive oil. Dr. A. W. Lee, resident medical officer at the hospital, said he was responsible for the drugs and instruments. It was part of his duty to dispense the drugs. Occasionally, when he was busy and unable to dispense medicines himself, he had entrusted his keys to the sisters—trained nurses—to enable them to procure what they required. The jury, in returning a verdict of "Death from misadventure," added that, "having heard in evidence that this misadventure arose from one of the nurses filling up at the dispensary a bottle labelled 'Olive Oil' with carbolic acid—a duty which should have been performed by the resident medical officer—draw the attention of the hospital authorities to the occurrence, with a view to their making such amended rules and regulations as may in the future prevent the possibility of such an accident."—*St. James's Gazette*.

POISONING BY MORPHINE.

The Islington coroner on Saturday, July 21, investigated the death of Andrew Ramsay Gordon, aged 32, a chemist's warehouseman, of 58, St. John's Road, Upper Holloway. It was explained that the deceased had been in the habit of taking morphine muriate to produce sleep. The presence of an abscess in the groin led Dr. Rattray to conclude that it caused great pain, and that death was due to an overdose of morphine taken to alleviate the pain. The jury endorsed the medical testimony by returning a verdict of "Death from misadventure."—*Morning*.

LIQUID AMMONIA MISTAKEN FOR HERB TEA.

The borough coroner (Mr. R. Taylor) held an inquest at the New Inn, Halliwell Road, Bolton, on July 20, regarding the death of William Hart, aged 76, which took place on Thursday morning. Deceased drank some ammonia in mistake for herb tea, and his mouth was badly burned.—Dr. Thornley stated that he was called on Sunday morning to meet Dr. Barnes and see the deceased. They found the whole of the mouth and throat red and swollen; and deceased had great difficulty in breathing. All remedies possible were administered to relieve him, but he gradually grew worse, and died from exhaustion. The coroner said it was a very sad case. He had known the deceased many years, and he was sorry

he had died under such lamentable circumstances. Deceased had lost his sense of smell, and it was certain that he did not know what he was drinking. The jury returned a verdict of "Death from misadventure." The coroner then showed to the jurymen a patent novelty he had received, which it was claimed would prevent, if used, many cases of poisoning. It consisted of a small bell attached to a cork, and if one of these was used for each bottle containing poison, the patient would be warned of its contents (see *Ph. J.*, lili, 1094). Many people used chloral or laudanum during the night, and if a bell was attached to the bottle there would be no mistake of the wrong medicine being used in the dark. The little appliance, which was very cheap, might save many lives, and like many coroners he had pleasure in recommending its use. It was stated that the life of the late Dr. Tyndall would have been saved had such an article been in use.—Dr. Thornley considered it a good idea to have a small bell fastened to the cork of every bottle containing poison used in houses, and the jurymen also endorsed this view.—*Bolton Journal*.

Notes and Queries.

MUSTARD PLASTERS.

These plasters are frequently spoiled, C. B. Lowe points out, by being dipped in hot water before use, under the impression that their action will thus be intensified. Since, however, the myrosin in mustard is coagulated at 140° F., and thus rendered incapable of splitting up the glucosides present, patients should be warned to wet the plasters with tepid water only (*Am. Journ. Pharm.*).

ADHESIVE PASTES.

Of simple flour pastes that made from rye flour possesses the greatest adhesive power. A much more satisfactory preparation, however, is obtained as follows:—Thoroughly mix wheat flour, 4 ozs., borio acid, 10 grains, and water, 16 ozs. Strain the mixture through a sieve and add nitric acid, 1 drachm. Apply heat and stir constantly until thickening occurs, and when the mixture is nearly cold add oil of cloves, 5 drops. The resulting product is highly adhesive and improves in that respect with age. It will keep indefinitely, and even when dry and horny recovers all its former properties on the addition of water. Another useful paste is made by dissolving gum arabic, 2 ozs., in water, 12 ozs., and adding starch, 1½ ozs., and white sugar, ½ oz. The mixture is then heated on a water-bath until it becomes clear, when a few drops of oil of cloves may be added to preserve it. The product will be of the consistency of tar, and should remain so.

HYPODERMIC INJECTIONS OF QUININE.

The following formulae for these injections are given by H. Marty:—(1) Quinine di-hydrochlorate, 5 Gm.; distilled water, q.s. to make 10 C.c. Each cubic centimetre will contain 0.50 Gm. of the salt. (Beurmann and Villejean's formula). (2) Quinine mono-hydrochlorate, 3 Gm.; antipyrine, 2 Gm.; boiled distilled water (re-cooled to +15°), 6 C.c. The ingredients should be dissolved in the water in a sterilised flask, at a temperature of 40° to 50°, and the volume of the solution made up to 10 C.c. at 15°. One cubic centi-

metre will then contain 0.30 Gm. of the salt of quinine (*Journ. de Pharm.*).

SODIUM SALICYLATE AND CAFFEINE.

A combination of these substances is prepared by Dellasuda as follows:—Dissolve sodium salicylate, 9.30 Gm., in distilled water 50.0 Gm., and gradually add caffeine, 15.0 Gm. When complete solution is effected, filter, and evaporate to dryness on a water-bath. The residue forms large, glistening, ivory-like scales, said to contain 62 per cent. of caffeine. They are soluble in their own weight of water at ordinary temperatures (*Rev. med-pharm de Constantinople, and Bull. de Pharm. de Bruxelles*).

ARSENIC OR ARSENIUM.

"Why should there be a different Latin word for arsenic in the titles 'Liq. Arsenici Hydrochlor.' and 'Liq. Arsenii et Hydrargyri Iodide'?"—S. C. REDMAN.
In the first case, arsenious anhydride (arsenicum) is referred to, and in the second the element itself (arsenium).

PROPENYL HYDRATE.

The following prescription, by an American skin specialist, has been submitted by Mr. J. Rutherford Hill, as being of interest on account of the uncommon use of the name "propenyl hydrat." for a not familiar compound. The prescription is said to have puzzled a number of pharmacists, and to have been read by some as ordinary "paraphenyl-hydrate, but reference to a chemical work would have shown that the substance meant is the trivalent alcohol, glycerc, which is the hydrate of propenyl $\begin{matrix} C_3H_5 \\ | \\ H_2 \end{matrix} \left\{ \begin{matrix} O \\ H \end{matrix} \right\}_3$ just as ordinary alcohol is the hydrate of ethyl $\begin{matrix} C_2H_5 \\ | \\ H \end{matrix} \left\{ \begin{matrix} O \\ H \end{matrix} \right\}_1$ —

R.		
Resorcin	3ss.	
Tinct. toluen		
Tinct. benzoin	3ii.	
Propenyl hydrat	3iss.	
Aquam	ad	3vi.

M.

Sig.: The lotion. To be used as directed.

Obituary.

Notice has been received of the death of the following:—

On June 16, George Munnerly Baxter, Pharmaceutical Chemist, Sydney, Australia. Mr. Baxter was a life member of the Society, and a former student and prizeman in the School of Pharmacy.

On July 4, R. Cade Cuff, Chemist and Druggist, Bristol.

On July 7, Robert Enos Collins, Chemist and Druggist, of Boston. (Aged 39.)

On July 10, John Askew, Chemist and Druggist, of Carnforth. (Aged 61.)

On July 12, Henry Lamplough, Chemist and Druggist, of Holborn. (Aged 81.)

On July 16, George B. Gudgeon, Chemist and Druggist, Kimbolton. (Aged 71.)

Books, etc. received.

NEURS PHARMACEUTISCHES MANUAL. Edited by EUGEN DIETRICH. Twelve parts at 1s. each. Pp. 72. Berlin: Julius Springer. From the Publisher.
PHILADELPHIA COLLEGE OF PHARMACY. Syllabus for 1894. Pp. 46. From the College.

Correspondence.

THE DETECTION OF SUGAR IN URINE.

Sir.—The paper of Sir George Johnson, on "Some Common Sources of Error in testing for Sugar in the Urine," calls timely attention to a matter of great practical importance. The excellent work which Sir George and his son, Mr. Stillingfleet Johnson, have done in this and similar directions renders any additional matter from their pens of exceptional interest and importance. As a yet unpublished paper on "The Examination of Urine for small quantities of Sugar" was read by me at a recent meeting of the Society of Public Analysts, when, at my invitation, Mr. Stillingfleet Johnson was present*, I may perhaps claim to make some observations on Sir George Johnson's interesting paper.

The question of the occurrence of traces of sugar in normal human urine has been the occasion of much controversy, and the last word still remains to be said. Brücke appears to have been the first to state that all normal urines contained sugar, and this view was supported by Bence Jones, and by Kühne, but opposed by Friedländer, Wiedersheim, Meissner, and Babo. The question was re-examined in 1871 by Seegen, who pointed out many fallacies in the methods of those who had found sugar, and concluded that it was either absent from normal human urine, or present in such small proportion that the then existing methods were insufficient for its positive recognition in the presence of co-occurring substances which simulate many of its reactions. On the other hand, Dr. F. W. Pavy, in 1878, concluded that sugar was a normal constituent of urine, and that no sharp line of demarcation could be drawn between the excretion in health and in diabetes, except quantitatively. Molisch, again, from the examination of a large number of samples of urine from healthy persons by the alpha-naphthol and thymol tests, came to the conclusion that traces of sugar are met with frequently in human urine; but the value of his tests and hence the accuracy of his conclusions have been disputed by Loukes and also by Seegen (*Journ. Soc. Chem. Industry*, vi., 149, 150). E. Luther, also, as the result of the application of the furfural and alpha-naphthol tests to a large number of samples, concludes that glucose is present in all human urine, the amount found in the excretion of adults averaging 0.1 per cent., while the total carbohydrates amount to 0.5 per cent. (*Chem. Centralb.*, 1891, ii., 99; and *Journ. Chem. Soc.*, ix., 1559). According to E. Roos (*Zeitschr. physiol. Chem.*, xv., 518), the normal urine of the dog, horse, and rabbit always contains more or less carbohydrates, as indicated by the furfuraldehyde reaction and confirmed by the benzoic chloride test. Human urine is stated by Roos always to give an affirmative reaction with phenyl-hydrazine, and the same is true of dogs' urine, while the excretion of rabbits gives especially well-formed crystals. The urine of all these animals was found to be slightly levorotatory. By the production of the crystalline phenyl-glucosazone—a method free from the objections and fallacies which underlie nearly all other tests—I have proved to my own satisfaction that minute quantities of sugar are present in some specimens of urine from persons apparently in perfect health.

Dr. Pavy, in a letter published in the *Lancet* for July 14, asks the very pertinent question, if the crystalline osazones yielded by many samples of normal urine when examined by the phenyl-hydrazine test be not indicative of sugar, to what body must its formation be ascribed? Of course glycuronic acid and its compounds are known to give a crystalline compound with the phenyl-hydrazine test, but they do not appear to exist in healthy urine. The fact appears to be that while normal human urine may contain traces of sugar, which certainly appears there temporarily on very slight provocation, sugar is by no means constantly present, and a great number of the observations recording its occurrence are quite inconclusive. But a hundred cases of non-occurrence do not disprove a single well-authenticated case in which sugar has been detected. To say that the very fact of sugar being present proves the urine to be abnormal is to beg the question. From the paper of Sir George Johnson, and correspondence and conversation with his son, I gather that they both hold a strong negative opinion as to the existence of traces of sugar in normal urine. This opinion appears to

be largely based on the results obtained by examining urine from which all uric acid and kreatinine have been previously removed by suitable treatment with mercuric chloride. I have had a considerable experience of the mercuric chloride method, which was originally proposed by Mehu, but has been improved by Mr. Stillingfleet Johnson. His present plan of removing the kreatinine by boiling the liquid for a few minutes, instead of allowing it to stand for some days at the ordinary temperature, is, I believe, a direct outcome of my objection to the time required for its separation. There is no question that mercuric chloride, used as directed by Mr. G. S. Johnson in presence of sodium acetate, so that potentially mercuric acetate is the reagent employed, is one of the most perfect precipitants which can be used. The precipitate produced in the cold contains all the phosphates and urates of the urine, together with the xanthine-bases, colouring matters, and any albuminous matters which may be present; while on standing or boiling the kreatinine is precipitated.* I prefer to add solid mercuric chloride and sodium acetate to the urine instead of using solutions of these substances, but this is a detail. Mr. G. S. Johnson, however, both in his published papers and his letters to me, recommends the use of a saturated solution of mercuric chloride in the proportion of one to four of the urine. Sir George, on the contrary, prescribes the very large proportion of nineteen-twentieths. I have found the subsequent removal of the excess of mercury most difficult to effect with certainty by means of ammonia, which, according to Mr. G. S. Johnson, should be dilute and added drop by drop, avoiding an excess, but, according to his father, should be employed strong, and to the amount of a few drops. Unless the mercury be perfectly removed at this stage, the subsequent estimation of the sugar by titration with Pavy's copper solution becomes impossible or inaccurate. Hence I have found it preferable to remove the excess of mercury by boiling for a few minutes with zinc-dust and filtering. To the filtrate I add a considerable excess of ammonia, which keeps the zinc in permanent solution, and I have proved that neither the ammonia nor the zinc and sodium salts introduced materially affect the accuracy of the determination. I have obtained excellent agreements in experiments, otherwise similar, in some of which zinc-dust and in others ammonia was used to precipitate the mercury. But the curious point is that, in every one of the somewhat limited number of samples of urine from presumably healthy persons which I have hitherto examined by the mercuric chloride process, a small quantity of sugar has been indicated by the result of the Pavy titration. In some cases the proportion was as low as 0.05 per cent. of the urine, but a wholly negative result was never obtained. Of course, the Pavy titration, even when conducted on urine which has been put through the mercuric chloride treatment, does not afford any absolute proof of the presence of sugar; but the samples which gave these small indications of apparent sugar yielded crystals of glucosazone by the phenyl-hydrazine test, and this fact is not capable of being readily explained away. On the other hand, Mr. G. S. Johnson states that, after subjection to the mercuric chloride treatment, healthy human urine gives no indication of sugar by the Pavy reaction, or at any rate he affirms that no trace of sugar then exists in the liquid. In this case it would be possible to add an infinitely large volume of the treated urine to a limited volume of Pavy's solution without the blue colour being lessened or destroyed. It would be interesting to learn from Mr. Johnson whether he has actually found this to be the case. As explained by Sir G. Johnson in his paper, the presence of kreatinine in normal urine causes the production of a red coloration with an alkaline picric acid solution, and it follows that, however convenient picric acid may be for the rough determination of sugar in typical diabetic urine, it is useless as a test for the traces of sugar alleged to be sometimes present in the excretion of healthy persons. Sir George attempts to make a correction for the similar colour due to the kreatinine. It is true that the normal proportion and variation of the kreatinine of urine have been far less studied than that of the uric acid, although the former is present in considerably greater amount. This is largely due to the fact that uric acid and urates make themselves evident very readily, while their

* The urea is incompletely precipitated on boiling.—A.H.A.

physical characters give them great pathological significance. On the other hand, kreatinine affords no indication of its presence to the casual observer, and its physiological and pathological significance are very imperfectly understood. According to Mr. G. Stillingfleet Johnson, about 2 grammes of kreatinine are excreted daily under normal conditions, against 0.5 gramme of uric acid, while Voit states the daily output of kreatinine at from 0.5 to nearly 5.0 grammes. It has further been proved by other observers that, as might be expected, the excretion of kreatinine varies largely with the diet, being greater when this is of a highly nitrogenous character. Taking Mr. G. S. Johnson's figure of 2 grammes daily, and accepting his statement that the copper-reducing power of this amount is equal to that of 1.6 gramme, or about 25 grains, of glucose, it follows that normal urine will exert a copper-reducing power corresponding to 0.5 grain per ounce, and the reduction from the same cause is likely under a highly nitrogenous diet to reach two or three times this proportion. This amount will seem very insignificant to those who are in the habit of dealing with typical diabetic urine containing fifty times as much, but it is by no means negligible when small quantities of true sugar are in question, or when it is sought to ascertain with certainty whether traces of sugar are sometimes present in normal human urine. Now that we possess a means by which kreatinine may be readily and completely removed from urine, it appears to me a pity to attempt to apply the picric acid test for sugar in its presence, as is proposed by Sir G. Johnson. In my opinion, it is far preferable to remove the kreatinine by the mercuric chloride treatment and then test for sugar in the filtrate, after removing the excess of mercury. If this be effected by boiling with zinc-dust, as already described, the filtered liquid is well fitted for the determination of sugar, either by the volumetric copper process of Pavy, or the colorimetric method with picric acid advocated by Sir George Johnson.* I may here mention a modification of Pavy's process which commends itself for use by medical men in that it does not necessitate the use of special apparatus. To avoid this disadvantage I have devised the following form of the test:—An accurately measured volume of 10 c.c. or 100 minims of Pavy's ammoniacal copper solution, prepared in the usual way, is placed in a wide test-tube, and ten or twelve drops of petroleum or paraffin burning oil added. This forms an upper layer which effectually excludes the air. The test-tube is inserted into the neck of a wide-mouthed flask containing hot water, which is then heated until the contents of the test-tube have reached the point of ebullition. It is desirable to add a few fragments of broken clay tobacco-pipe to the contents of the tube, to ensure a constant evolution of vapour. The urine to be tested is treated with an equal measure of ammonia and filtered from the precipitated phosphates. A known volume of the filtrate is then further diluted with a definite measure of water, according to the proportion of sugar supposed to be present, and then added drop by drop to the boiling hot Pavy's solution by means of a small burette or graduated pipette, until the disappearance of the blue colour indicates the termination of the reaction. If 10 c.c. of Pavy's solution were employed, the volume of urine required to decolorise it contains 0.005 gramme of sugar; or if 100 grain measures of the copper solution were used the urine contained 0.060 grain of sugar. By operating in the foregoing manner, fair approximate determinations of sugar are obtainable very rapidly and with the simplest of apparatus. Experiments in my laboratory by Mr. G. Bernard Brook show that unclarified urine from healthy persons exerts on Pavy's solution a reducing action equal to that of a liquid containing from 0.1 to 0.3 per cent., or 0.4 to 1.3 grain per ounce, of sugar. Of course this reduction is not due entirely to actual sugar, the kreatinine and uric acid being accountable for the greater part of it.

Sheffield.

ALFRED H. ALLEN.

* Instead of removing the mercury, iodide of potassium may be added in quantity sufficient to redissolve the precipitate first formed. On then adding caustic alkali solution, no precipitate is formed in the cold; but on boiling a grey precipitate of metallic mercury will be thrown down, if glucose be present. Unfortunately, this reaction cannot readily be made quantitative.—A. H. A.

A BASE DEFENCE.

Sir,—Permit me, through your columns, to make a note or two on the recent action at St. Helens, which you said you intended publishing in detail in the next issue of the *Pharmaceutical Journal*. In the cross-examination of the defendant, he first stated that your agent (Mr. Foulds) said that the "chlorodyne was for Mr. Wallbridge." I neither know, nor have I seen, Mr. Foulds. I do not know Mr. Harrison, and I have never sent to his shop at any time for any article; consequently, the statement that "occasionally sent" was an untruth, which ought to be exposed, as it might prejudice a certain section of the public. His other remark is extremely prejudicial. Is it likely, if they thought I would be likely to send for a "catch," that they would sell a bottle containing a scheduled poison if my name were mentioned in the matter? I say no! these statements are in entire opposition to each other. The presumption that I sent for the article is based only upon the fact that I am the local secretary. Further, in conclusion, I did not even inform of the man as, being only a few yards away, information would savour too much of personal animosity.

St. Helens.

J. G. WALLBRIDGE,
Local Secretary.

Answers to Correspondents, etc.

M. P. S.—Yes! It is *Leonurus cardiaca*.

Diary of the Week.

MONDAY, JULY 30.

British Pharmaceutical Conference (Oxford Meeting).
Meeting of the Executive Committee at the Randolph Hotel, at 6 p.m.
Reception by the President and Conversations in Christ Church Hall, at 8.30 p.m.
Federation of Local Pharmaceutical Associations.
Meeting of Delegates at the Randolph Hotel, Oxford, at 6 p.m.

TUESDAY, JULY 31.

British Pharmaceutical Conference (Oxford Meeting).
Sessions of Conference in the Hall of Balliol College, at 10 a.m.
Luncheon at the Randolph Hotel, at 1 p.m.
Sessions of Conference, at 2 p.m.
Garden Party in the grounds of New College, at 4.30 p.m.

WEDNESDAY, AUGUST 1.

British Pharmaceutical Conference (Oxford Meeting).
Sessions of Conference, at 10 a.m.
Luncheon at the Randolph Hotel, at 1 p.m.
Sessions of Conference, at 2 p.m.
Visits to various Colleges, the City, etc., at 4.15 p.m.
Smoking Concert at the Randolph Hotel, at 9 p.m.

THURSDAY, AUGUST 2.

British Pharmaceutical Conference (Oxford Meeting).
River excursion to Abingdon, starting from Folly Bridge, at 9 a.m.
Luncheon in the Council Chamber, Abingdon, at 1.30 p.m.
Boats leave Abingdon, at 3 p.m.
Visit to Nuneham Park, at 4 p.m.
Tea on board the boats, at 5 p.m.
Arrival at Oxford, at 8 p.m.

FRIDAY, AUGUST 3.

Quekett Microscopical Club, at 7 p.m.
Exhibition of Objects.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Acland, Allen, Bird, Hill, Iner, Lucas, Maillard, Mathew, Mumbray, Naylor, Parker, Ransom, Turner, Wallbridge, West.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, AUGUST 4, 1894.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.C.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMIDGE, Secretary, 17, Bloomsbury Square, London, W.C.

Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STREET BROTHERS."

THE CONFERENCE AT OXFORD.

"OXFORD was a small town, and a poor town, and the pharmacists there were fewer and poorer than in many other places." Thus was Mr. DRUCE reported as speaking last year, after stating that it was rather a daring thing for any town to come forward and invite the Conference to visit it after the successful experience of the Nottingham meeting. Nevertheless, the invitation was given and accepted, and there is good reason to believe that the members of the Conference generally were glad to feel that they should be able to visit a place of national interest without throwing a burden upon their brethren located there. Judging from appearances, there is not the least doubt also that they have thoroughly enjoyed their visit, to an extent that must be most gratifying to Messrs. PRIOR, MATHEWS, DRUCE, and the other members of the local committee who assisted in providing so delectable a programme. It is unnecessary here to refer to the attractions of Oxford as a place of meeting, these being fully dealt with elsewhere in the Journal, and it therefore only remains to treat of the strictly business aspect of the thirty-first annual meeting of the Conference.

At the opening meeting in the hall of Balliol College, after the usual preliminary business, the visitors were welcomed by the Master of Balliol, Dr. CAIRD, the Mayor of Oxford, WALTER GRAY, Esq., and Sir HENRY ACLAND, Bart., K.C.B. The President then proceeded to deliver his address.

The subject chosen by Mr. MARTIN for his address—medicine and pharmacy—was one which afforded him almost unlimited scope in its treatment, and he took the opportunity to speak as candidly of British pharmacists and pharmacy as he did some months ago, in another place, of their American counterparts. Premising that all might not agree with what he would say, though his views had not been hastily adopted and were not lightly held, the President expressed his intention of taking full

advantage of his position to speak to the members *ex cathedra*. In answer to the question whether the condition of pharmacy in its own special domain is satisfactory at the present time, he was compelled to speak in the negative, but he argued that this is in very great measure due to certain peculiar directions in which the trade in medicines has developed in recent years, and that the Pharmaceutical Society is most certainly in no degree to blame for the present condition of affairs. It is rather registered chemists and druggists who are to blame, for endorsing the falsehoods of advertising quacks and helping to create on the part of the public an enormous and unhealthy demand for proprietary medicines. The manner in which medical practitioners are inveigled into recommending and prescribing quack remedies was also forcibly declaimed against.

Returning to pharmacy, Mr. MARTIN expressed the opinion that a grave mistake was made when power was given, under the fifth section of the Pharmacy Act, 1868, to place on the Register without examination or fee all who claimed to have been in business as chemists and druggists prior to December 31, 1868. The baneful influence of the purely trade element is still on the Register, and threaten to overthrow the very principle to support which the Pharmacy Act was obtained. It is impossible, it was pointed out, in the practice of pharmacy, to grasp commercial advantages and yet retain the rewards properly belonging to professional services, and pharmacy must shortly make its choice between the two. The very essence of trade is that it is capable of indefinite expansion, and there is no limit to the extent to which a tradesman may sell his goods through the agency of others. But indefinite expansion is impossible in the fulfilment of the proper functions of pharmacy, which stamp it as a profession rather than a trade, requiring its members to receive a special education and give evidence before a legally constituted body that they have been so educated. The service rendered, also, is personal and direct.

The non-recognition of the professional status of pharmacists is undoubtedly due, said Mr. MARTIN, to the preponderance of the trade element and the commercial spirit amongst registered men, and this has handicapped the Pharmaceutical Society, rendering it difficult for it to advance upon the lines and in the spirit of the Pharmacy Act. Pharmacy as a trade is a failure, and rightly so, as nothing can justify the use of professional knowledge to excite men's fears and play upon human credulity for gain. Regarding the steps which should be taken to enable pharmacy to realise its privilege and accept its responsibilities as a profession, it was recommended that the entrance examination should be made a more stringent test of intellectual powers and school training. Algebra, geometry, history,

geography, and a modern language should be included in the syllabus, and an extended knowledge of Latin should be required. The examination should not be passed before the age of seventeen, and should be followed by a three years' actual apprenticeship. An enforced curriculum covering two years should then precede the qualifying examination, lasting a week or more, and success in this should carry with it the qualification and title of pharmacist.

The question of recompense for all this, however, must be left to the future, as pharmacy must not expect to receive its reward before it has properly equipped itself for service. If the pharmacist will but continue unremittingly in his endeavours to raise himself, the dispensing of medicine is bound to come to him in the natural course of things. As to the principle upon which the remuneration of the pharmacist should be based, Mr. MARTIN was very decided. The dispensing chemist, he said, must be paid at a rate which will enable him to get his living honestly and openly, and render him superior to the temptation to increase his profit by tampering with the quality of what he sells. His remuneration should also enable him to devote a proper amount of time and care to his work, and so eliminate a very real source of danger consequent upon the haste and bustle of trade methods.

After briefly referring to certain points where improvement might be effected in Conference matters, Mr. MARTIN brought to a close an address which merits the fullest consideration from all British pharmacists. The evils complained of by him are of long standing and may require sharp treatment, but it is above all things desirable that all engaged in pharmacy should be fully aware of their existence, and the extent to which they check healthy development.

At the conclusion of the address, a vote of thanks to the President was proposed by Mr. MICHAEL CARTWRIGHT, President of the Pharmaceutical Society and Vice-President of the Conference. He described the address as one of the most able to which he had ever listened, and spoke of the peculiar appropriateness of the fact that it had been delivered by one hailing from Newcastle-on-Tyne, where the Conference first met, and that it embodied similar ideas to those so ably propounded in former years by the late HENRY B. BRADY, who was also a Newcastle pharmacist. Mr. DRUCE having briefly seconded the motion, it was supported in eloquent terms by Sir HENRY ACLAND, after which the vote was unanimously accorded.

The reception of delegates then took place, and was followed by the reading of the report of the Executive Committee by Mr. NAYLOR (Honorary

Secretary). In presenting the thirty-first annual report, the Committee was able to state that general interest in the work of the Conference shows no sign of diminution. Increased membership is still, however, a desideratum, for although the last two annual meetings have been exceptionally well attended, the number of enrolled members represents no marked increase. With the view of bringing the Blue List up to date, it has been completely revised by a sub-committee appointed by the Executive. Several new subjects have been introduced, the majority of which are specially adapted for investigation by pharmacists, while others have been expunged. Only one application for a money grant in aid of research has been received during the year, the sum of £3 having been granted to Mr. H. BOWDEN in furtherance of his investigation of *Hemidesmus indicus*. Mr. R. A. CRIPPS has been unable during the year to continue his work on *ipecacuanha*, for which grants have been previously made to him, but he hopes shortly to resume his examination of this drug. Mr. W. ELBORNE, B.A., who was last year the recipient of a grant, is also unable at the present time to supply a further instalment of his work on *coto bark*. The Conference has lost by death several valued members during the past year. Of these, Professor BENTLEY was probably the most widely known. He was one of the founders of the Conference, and filled the office of President for two consecutive years—at Nottingham in 1866, and at Dundee in 1867. His long association with pharmacy as a professor, and his devoted enthusiasm to botany, brought him into contact with distinguished men from all parts of the world. His works on botany and materia medica have long been and still are justly valued. In the last annual report reference was made to the resignation of Mr. R. H. DAVIES, as Honorary Treasurer of the Conference, owing to prolonged illness. In recognition of his services he was last year elected Vice-President. To the deep regret of his numerous friends the illness terminated fatally. Professor J. M. MATSCH, of Philadelphia, an honorary member of the Conference, and the author of valuable pharmaceutical works, also died last autumn shortly after receiving the HANBURY medal. For twenty-six years he had acted as permanent Secretary to the American Pharmaceutical Association. Lastly, the Committee had to record the loss of Mr. W. D. SAVAGE, of Brighton, a veteran pharmacist and former Vice-President of the Conference, whose death took place only a few weeks ago. Through the decease of Mr. R. H. DAVIES a vacancy occurred in the Vice-Presidency, to fill which the Committee elected Mr. J. H. MATHEWS, of London. Two honorary members have also been elected during the year, Professor JOSEPH P. REMINGTON

of the Philadelphia College of Pharmacy, and Dr. ANTON VON WALDHEIM, President of the Gremium of Pharmacists of Vienna.

Financial Statement. The financial statement for the year, and the report of the Treasurer of the "BELL and HILLS' Library Fund," were next read. The first showed that the position of the Conference in this respect was fairly satisfactory, a small balance being left in hand. The main item of expenditure was, as usual, the cost of publication of the 'Year-Book.' In presenting the statement, the Hon. Treasurer, Mr. JOHN MOSE, endorsed what had been said in reference to the late R. H. DAVIES, and urged that the best way of improving the financial position was for members to induce others to join the Conference.

Unofficial Formulary Committee. The report of the Unofficial Formulary Committee, read by Mr. MARTINDALE, stated that since the last meeting of the Conference a new edition of the Formulary had been produced and was now on sale. Four new formulæ have been added, viz., 'Collodium Stypticum,' 'Extractum Belladonnae Folii Alcoholicum,' 'Liquor Bromochloral Compositus,' and 'Syrupus Acidi Hydriodici.' Other alterations consist chiefly in lessening the acidity of certain syrups, and in an improved formula for 'Collodium Belladonnae,' which is now directed to be made from a solid alcoholic extract of belladonna leaf, assayed at the time it is used so as to obtain a uniform product, instead of from a liquid extract.

The reading of papers was then proceeded with, in the order of the following abstracts:—

Stability of Tinctures. During the progress of their work on tinctures, Messrs. FARR and WRIGHT preserved specimens of each of those operated upon, with the intention of turning their attention later to the question whether or not tinctures, whose active principles can be readily and accurately determined, suffer any diminution in strength when kept for a length of time. A number of the tinctures have now been examined, after being kept for periods ranging from twelve months to three years, and the results obtained prove that the strength of the alkaloidal tinctures, so far as can be judged from the determination of their alkaloidal constituents, remains approximately the same for a considerable length of time. It may fairly be assumed, therefore, according to Messrs. FARR and WRIGHT, that when preserved under normal conditions such tinctures remain constant in composition. A tabular statement was submitted and showed the results of the examination of tinctures of aconite, belladonna, cinchona, colchicum, hyoscyamus, jaborandi, lobelia, stramonium, and veratrum viride. The most notable instances of loss of alkaloid were in

the case of the tinctures of cinchona and veratrum, the loss being probably due to mechanical action, and in the most extreme case the average loss did not amount to 5 per cent.

Determination of Alkaloids in Tinctures. In the course of the same work on tinctures, Messrs. FARR and WRIGHT employed gravimetric processes for determining their alkaloidal contents.

CASPARI and DOHME, however, read a paper before the American Pharmaceutical Association last year, in which it was claimed that the determination of alkaloids in galenical preparations may be effected more accurately by titration than by weighing. In order to ascertain whether this assertion had any foundation in fact, the English workers performed an elaborate series of experiments, the results of which go to prove that volumetric methods are useless in the case of aconite and colchicum; unsatisfactory with cinchona and veratrum; but of greater value for belladonna, henbane, stramonium, conium, jaborandi, lobelia, nux vomica, and opium. In the case of gelsemium the figures showing the comparative results obtained by the two processes accord very closely. As a general process, a method of volumetric determination was described, which may "be found in some cases almost equally reliable and somewhat more expeditious than gravimetric processes," but it was maintained, in conclusion, "that the results yielded by the latter are, if anything, the more reliable of the two."

Preparation of a Typical Dentifrice. The qualities of a typical dentifrice, adapted to general use, were formulated in a paper by Mr. A. TURNER, L.D.S. As a mechanical base chalk is to be preferred, "prepared" rather than "precipitated," powdered pumice and charcoal being rejected on account of possessing various undesirable properties. The prepared chalk should be free from silica, a little sodium bicarbonate may be added to it to give increased acidity, and oil of cinnamon should be used as an antiseptic. Astringent substances should not be employed in tooth-powders, and colouring matter, if used at all, should be harmless and neutral. The finished dentifrice is best put up in wide mouthed bottles with sprinklers, labelled with full directions for use.

Extracts. A method was then suggested by Mr. E. W. LUCAS for the economical preparation of an extract of nux vomica. Nux Vomica. preparation of an extract of nux vomica which, while firm in consistence and free from oil, shall be little liable to loss by evaporation. The process consists in macerating nux vomica in fine powder, 16 ozs., for four days in chloroform water, 2 pints, to which acetic acid, 2 fluid ozs., has been added. Percolation is then performed and continued by adding more chloroform water until a gallon has been collected. The percolate is next evaporated at a low temperature to 4 ozs. by

weight, glycerin, $\frac{1}{2}$ oz. by weight, being added towards the end of the operation. Finally, the alkaloids are determined in the usual way and the extract is brought to the required standard. To prepare the corresponding dry extract, the glycerin is omitted and the evaporation continued as far as possible on a water-bath, the residual water being afterwards driven off by means of a hot oven or drying chamber. The dried product should be rapidly powdered and mixed with sufficient liquorice or other inert powder to bring it to the required strength, after which it must be preserved in small vials, hermetically sealed.

The next paper embodied the results of determinations of the active constituents of the seeds of *Strychnos ignatia*, Lind., which have been

made by Mr. F. RANSOM, for the sake of comparison with *nux vomica* seeds, the methods employed being those of DUNSTAN and SHORT. As a result it appears that, although the seeds of *S. ignatia* may occasionally contain a larger proportion of strychnine, as compared with brucine, than those of *nux vomica*, the percentage is more variable, and the average percentage of total alkaloid is considerably less. The glucoside, loganin, discovered in *nux vomica* by DUNSTAN and SHORT, appears also to be present in *ignatia*. Mr. RANSOM suggested that the results of the investigation indicate that *nux vomica* is the better adapted for pharmaceutical preparations, and that *ignatia* is not likely to prove of much value for medicinal purposes, though it may be used for the occasional extraction of strychnine.

Attention was next drawn to the genus *Gnetum* (*Gnetaceæ*) by Mr. W. ELBORNE, who referred to the fact that the stems of plants belonging to it possess internally the remarkable ringed structure characteristic of the natural order *Menispermaceæ*, and are consequently not unlike that of *Pereira brava*. The only other point in this somewhat nondescript paper was that while "*Abuta*" and "*Butua*" are popular Brazilian terms for *Pereira brava* and *Abuta*, Aubl., an allied genus, the genus *Abutua*, Lour., is yet synonymous with *Gnetum*, L.

An important subject to pharmacists was then introduced by Mr. R. H. PARKER, in his paper on the recovery of residual tinctures from marcs. As

he pointed out, the best method to be employed for this purpose must depend to a great extent upon the quantity of material under operation, and the kind of apparatus available. The question was considered with reference to the preparation of not more than four pints of tincture with such apparatus as may be found in any pharmacy, pressure and displacement by water being the two methods described as available under

these conditions. Using pressure, the best results are obtained when the quantity of marc reaches the maximum capacity of the tincture press, and results almost equal to those produced by hydraulic power may be obtained with a good screw-press, if the cup for receiving the marc is comparatively narrow and nearly filled. Displacement by water was next considered, and comparative experiments in "downward" and "upward" displacement were described and illustrated by sketches. The results in the two cases were shown by a tabular statement to be nearly identical. Other results described were of experiments in displacement by water *versus* displacement by alcohol and displacement of proof spirit and chloroform respectively by water. The deductions made from the different results are that the precision of displacement depends upon the relative affinities of the superposed fluids and their miscibility at the surface of contact; and that in the downward displacement of alcoholic tinctures by water, diffusion in advance of the rate of percolation takes place to an inconsiderable extent only. In conclusion, Mr. PARKER made several suggestions regarding the chief points to be observed in order to secure good results in the process of percolation and displacement by water, which was asserted to be much more economical than screw pressure, on a small scale, and quite reliable if carefully conducted, though better adapted to preparations made with strong spirit than those made with proof spirit.

On the ground that the pharmaceutical instructions do not apply to Tinctures, altogether calculated to ensure uniformity of product, under variety of manipulation, Mr. R. H. PARKER further suggested that all tinctures and similar preparations of about the strength 1 in 8 should be directed to be made by maceration only, without final adjustment of quantity; that of 1 in 4 or greater strength "to be prepared by percolation, so that N fluid parts of percolate represent the activity of one part of drug." The pharmacist would then be left to select his method of recovering the residual spirit, according to the quantity of materials dealt with.

Practical information on several points was furnished by Mr. F. C. BIRD in the first paper read on the second day of the sessions of Conference. It was stated that the property possessed by compounds of stearic acid with the alkali metals of forming gelatinous solutions with water—a small proportion of dissolved stearic soap sufficing to render a liquid almost solid—had been taken into account in the preparation of a liniment containing turpentine and ammonia in such proportions as had proved difficult to combine by means of *sapo mollis*. The method followed was to dissolve the stearic acid in the turpentine, add

Some
Laboratory
Notes.

Recovery
of
Residual
Tinctures.

ammonia mixed with distilled water, and agitate. A milk-white emulsion of turpentine was instantly produced, and showed no tendency to separate. The following formula was proposed for lin. terebinth. B.P.:—oil of turpentine, 16 fl. ozs.; camphor, 1 oz.; stearic acid, 80 grains; solution of potash, $\frac{1}{2}$ fl. oz.; distilled water, $1\frac{1}{2}$ fl. oz. The acid is melted on a water-bath with a little of the turpentine, and the mixture added to the remainder of the latter, in which the camphor is dissolved. The solution of potash and water are then mixed, the turpentine solution added, and the whole agitated until properly combined. The second note dealt with the purification of distilled water prepared on the continuous principle, by freeing it from ammonia. The plan recommended is to add before distillation potassium bichromate, 10 grains, and sulphuric acid, 6 fluid drachms, for each gallon of the still's capacity. The distillate is odourless, and answers the B.P. tests. The purified distilled water should be kept in a large glass bottle with stoneware tap and narrow neck, the latter being plugged with cotton wool and surmounted by a loosely-fitting tin cap. Under these conditions it may be preserved indefinitely without change, however the temperature may vary. In a third note it was suggested that the sulphuretted odour sometimes developed by syrup. hypophosph. so., B.P.C., was due to the fact that commercial calcium and manganese hypophosphites are rarely free from sulphate. The last note dealt with the advantages and disadvantages of re-percolation as a B.P. process, details being given of several experiments in which that method of exhaustion had been applied.

Four well-known brands of extract of malt with cod liver oil have been examined by Mr. H. W. JONES, whose paper came next in order. That preparation is popularly supposed to contain half its bulk of oil, but the results stated in the following table show that this is far from being the case:—

Extract.	Consistence.	Percentage of oil, by weight.	Percentage of oil, by volume.
A ...	Semi-fluid	22.76	29.5
B ...	Thick	17.82	24.0
C ...	"	14.48	20.1
D ...	"	1.38	2.0

To test the keeping qualities of spirit of nitrous ether, under specially good conditions, Mr. H. W. JONES set aside a number of samples at the beginning of 1893, and now described the results. The stoppers of the bottles were luted and tied over with leather, and the bottles were subsequently kept in a cool cellar, undisturbed, for fourteen to fifteen months. On examining the contents the loss of ethyl nitrite was found to be considerably less than anticipated.

This loss, though mainly due to evaporation, was probably to some extent due to the presence of water. In the only sample exceeding the limit of the B.P. as regards specific gravity (No. 9 in table) a notable change was apparent, as shown by the figures—

Spirit.	Description.	Sp. Gr.	NO from fresh spt.	NO after keeping.
1.....	Sol. ethyl nitrite.	.8400	41.0 C.c.	39.5 C.c.
2.....	Made as per "B.P."	.8398	41.0 "	34.0 "
3.....	Trade sample.	.8414	39.0 "	37.0 "
4.....	"	.8392	39.0 "	38.5 "
5.....	Made from liquor, 1.7.	.8379	38.0 "	38.5 "
6.....	Trade sample.	.8449	37.5 "	31.5 "
7.....	"	.8480	37.0 "	31.5 "
8.....	"	.8487	36.0 "	28.0 "
9.....	"	.8477	36.0 "	14.5 "
10.....	"	.8884	33.0 "	31.5 "

With a view to rendering the natural features of the district more intelligible to visitors, Mr. G. C. DRUCE, M.A., next gave some brief descriptive

notes on the geology, botany, and river systems of Oxford and neighbourhood, attention being directed chiefly to the geological formations and the occurrence and habitats of rare plants.

On Animal Extracts.

In the following paper Mr. C. E. STUART, B.Sc., referred to the large amount of attention recently directed to the use of extracts of various animal substances in the treatment of disease, doubtless consequent on the success of the treatment of myxœdema by thyroid extract. He gave a short review of the theories which have been proposed to account for the action of these extracts, and explained his formulae and methods of preparing several of the preparations, namely those from brain, spinal cord, supra-renal capsule, pituitary body, thymus, kidney, and bone marrow. He exhibited a powder prepared by repeated aqueous extraction and alcoholic precipitation of sheep's thyroid glands, which is now being experimented upon with regard to its activity. With respect to an improved formula for thyroid extract, he thought that there is no evidence that any method of preparing it gives better results than Dr. G. MURRAY's original formula. Points of interest connected with the uses, constitution, and chemistry of the various extracts were treated of as they arose.

The results of the examination of a supply of this plant, popularly known as "motherwort," handed

to Mr. W. A. H. NAYLOR some time ago by Mr. E. M. HOLMES, who had grown it, were next given in brief. The fresh herb having been pressed, 20 per cent. of rectified spirit was added to the juice obtained, as a temporary preservative, and, after some preliminary tests, the "succus" was evaporated over a water-bath to a soft extract. This extract was then treated with absolute alcohol, which left a residue partially soluble in water. The

matter soluble in alcohol was successively treated with ether, chloroform, etc.; the residue soluble in water and the insoluble residue were separately examined; and, finally, the marc left after expressing the juice was carefully investigated as to its constituents. The total results thus far obtained may be stated as follows:—*Definite*—potassium chloride, calcium phosphalate, citric, tartaric, and malic acids; *proximate*—bitter principle, hard resin soluble in chloroform and insoluble in ether, soft resin soluble in chloroform and ether, alkaloidal substance, potassium salt of an organic acid, fixed oil, wax soluble in petroleum ether, wax insoluble in petroleum ether, extractive soluble in alcohol and water, two extractives soluble in water only. This investigation serves as a useful illustration of the great amount of work required to determine the constituents of a single plant. The motherwort is not indigenous to this country, though it occurs in "hedges and waste places, England, Scotland, Ireland, Channel Islands, rare." Its distribution, according to HOOKER, is "Europe, N. and W. Asia, Himalaya; introd. in N. America." The herb is used for medicinal purposes in the United States, MAISCH describing it as containing volatile oil and a bitter principle, and possessing pectoral, tonic, and stimulant properties. It is generally administered in the form of an infusion, the dose being equivalent to 2 to 4 Gm. of the herb. A note on *L. cardiaca*, contributed at the last moment by Mr. E. M. HOLMES, was considered at the same time as Mr. NAYLOR's paper, and gave a brief historical account of the plant as a medicinal agent.

Conditions of Papain Digestion. Having had an opportunity of further studying the behaviour of papain as a digestive agent, Dr. S. RIDEAL, in the next paper, described some results obtained which seemed to him to clear up certain points that previously appeared doubtful. The pure ferment has not yet been isolated, and at present it is, according to Dr. RIDEAL, impossible to determine the amount in commercial samples, so that the value of any given specimen as an aid to digestion "can only be measured in terms of its relative activity to different brands of pepsin." It is hardly necessary, however, to remind our readers that the fallacy of tests of this kind has been repeatedly exposed in the Journal and elsewhere. The two ferments have but little in common in their properties, and if it be true, as recently suggested, that much commercial papain contains pepsin, what slight resemblance has been apparent may have been due to ignorance of the nature of the material experimented with. The experiments described by Dr. RIDEAL dealt with the influence of time, temperature, and the amount of ferment, water, or other substances present, on the rate of digestion. The action of papain in

acid, alkaline, and neutral solutions was then considered. Compared with pepsin under identical conditions, papain seemed to give the better results with meat fibrin, but with regard to egg albumin its digestive power appeared intermediate between that of the two pepsins examined.

Coco-Nut Stearin in Suppositories. Subsequently, the value of coco-nut stearin as a basis for suppositories and pessaries was considered by Mr. C. J. S. THOMPSON. In a paper read before the Pharmaceutical Society in 1866 (see *Ph. J.*, xxv., 544) BRADY referred to this stearin as being an inexpensive substitute for theobroma butter, and he stated that the following mixture "seems to keep unchanged for any reasonable length of time, and leaves little to be desired as a basis for pessaries":—Coco-nut stearin, 9 ozs.; lard, 1 oz.; oil of pimento, 20 minims. The lard was introduced partly as a tempering medium, and partly "to facilitate the proper division and admixture of the medicinal substance before adding to the melted stearin." The oil of pimento, of course, served as an antiseptic and prevented rancidity. Mr. THOMPSON finds, however, that this base is too soft, as it melts at 82° F. A formula giving satisfactory results in his hands is:—"Coco-nut stearin, 4 ozs.; white wax, 340 grs. Melt together with gentle heat over a water-bath." The melting point of the product is 98° F., and it becomes solid at 64° F. The mixture is said to form an admirable suppository base for belladonna, hamamelin, boric acid, and many other combinations. When desired, the melting point is easily lowered by using less wax. The base mixes well with vegetable extracts, does not go soft on keeping nor become rancid in contact with metallic salts, and it cools more rapidly than theobroma butter, so that suppositories can be taken from the mould in about ten minutes.

Phosphorus in Pills. The method recommended by Mr. R. H. PARKER, in the following note, for preparing phosphorus pills consists in dissolving sufficient phosphorus for twenty-four pills in carbon disulphide, 30 minims, pouring the solution upon liquorice powder, 24 grains, in a pill mortar, and stirring uniformly within the smallest possible space, by means of a spatula, until the solvent is nearly evaporated. As soon as the mixture becomes nearly solid, but whilst still moist, sufficient syrup is added, together with glycerin, 4 minims, and tragacanth powder, 2 grains, to form a soft pill mass, which is incorporated quickly until homogeneous. Any other ingredients may then be added and the mass divided into twenty-four pills, which need not be coated, and keep without material loss or oxidation. For determining the amount of free phosphorus the method adopted was to extract with carbon disulphide, oxidise to phosphoric acid, and titrate with standardised uranium acetate solution.

Nomenclature In view of the possible advent of an imperial pharmacopœia, Mr. JOSEPH INCE asked in the next paper that as new official remedies are adopted the latinised names applied to them should follow the ordinary rules of declension, as commonly known and accepted. His paper, which was full of examples, cannot profitably be condensed, but our readers will find it well worthy of attention when it is published in the Journal later. It may be stated, however, that no novelty in nomenclature was advocated, but only the systematic adoption of known rules in grammar to meet new requirements, the present condition of affairs being said to reflect on the scholarship of the day and embarrass the prescriber, who, "owing to the technical arrangement of a prescription, has to frame a terminology with declensions of his own."

Rhubarb and Henbane. A historical account of the introduction of medicinal rhubarb into England and its subsequent cultivation was then given in a paper by [Mr. RICHARD USHER, who pointed out that the effects of seedling cultivation of this plant are injurious. The inferior quality of the English rhubarb root of a few years ago was stated to be due to this cause. Since, however, propagation from offsets has been exclusively resorted to the plant has been restored to its primitive form of development and the product greatly improved, and prejudices against English rhubarb root are rapidly disappearing. With regard to henbane, Mr. USHER suggested that the plants should be classified in the order of their value into (1) biennial henbane of second year's growth; (2) biennial henbane of first year's growth; (3) British annual henbane; and (4) German henbane. It is now found possible, after a long and careful study of its cultivation, to preserve the first from the attacks of insects to which it is ordinarily subject, and thus loss of material and temptation to substitute inferior varieties are prevented.

The remaining papers were taken as read:—

Tinctura Ergotæ. A short time ago Mr. J. T. HORN-BLOWER was asked why one sample of *tinctura ergotæ ammoniata* should become cloudy on adding a fluid drachm to two ounces of water, while another remained clear under identical conditions. After performing a number of experiments he concluded that the fixed oil of the ergot and the soap formed from it by the ammonia of the spt. ammon. aromat. remove part of the essential oils and prevent the remainder from being dissolved. Consequently, the resulting tincture remains clear when mixed with water, although the menstruum with which it is prepared will not. This result is only produced, however, when the tincture is prepared by percolation and the whole of the

menstruum is passed through the ergot. If prepared by maceration and any deficiency in the quantity of the product is made up by adding fresh spt. ammon. aromat., a tincture is produced which will cause more or less cloudiness when mixed with water, according to the amount of the spirit so added.

Notes

on
Rhubarb.

The paper by Mr. B. S. PROCTOR gave an account of numerous observations and experiments which he had made during his pharmaceutical experience. The work originated with the desire to know whether the trade custom of trimming rhubarb was beneficial or otherwise. Experiments were detailed showing that soluble matters contained in water with which a porous body is saturated accumulated at the surface as the body becomes dry by evaporation, and that this migration of matter does not take place during the drying of a hydrated colloid. This action was supposed to account for a greater richness in extract in the exterior of the root than in the interior which was observed in the early experiments, but not found by subsequent experiments to be uniformly the case. The odorous principle of the root was found capable of being extracted by percolation with chloroform, without detracting from the medicinal value of the powder; but it was also found that the deodorated powder acquired smell again, apparently by the action of air and moisture. After some comments upon DRAGENDORFF'S analysis of rhubarb and the solubility of the different constituents of the root, Mr. PROCTOR pointed out that a simple method of assaying this drug suitable for the use of pharmacists was not yet in prospect. The presence of chrysophanic acid in both dried and fresh roots was shown, and that when the powder has been exhausted of this constituent by percolation with benzol, a further development of the acid takes place on submitting the exhausted powder to the action of air, water, and caustic potash. Fat was shown to be a natural constituent of the root, though in no case was it found in so large proportion as was formerly the case in the commercial powder. A few suggestions were made regarding some pharmaceutical preparations, and the paper concluded by indicating several points still requiring further investigation.

Soap Basis

for
Liniments.

The advantages possessed by liniment of potassium iodide over the other B.P. liniments induced Mr. E. W. LUCAS to consider whether a similar basis might not with advantage be adapted to the latter. It is therefore suggested that a useful preparation for the purpose may be made by dissolving curd soap reduced to fine shreds, 4 ozs., and soft soap, 1 oz., in distilled water, 16 ozs., by the aid of gentle heat, and then adding glycerin, 2 fl. ozs., and sufficient distilled water to make the strained

product weigh a pound and a half. The product is poured into a suitable vessel and allowed to solidify. Taking this as a basis, formulæ, which will be published in the Journal later, were given for the liniments of aconite, belladonna, camphor (compound), iodine, opium, potassium iodide, soap, and turpentine. It is anticipated that such liniments will be more readily absorbed by the skin than the ordinary preparations, while they are more cleanly and easy of application, as well as more free from risk of confusion with medicines for internal use.

Tincture of Iodine. The theoretical composition of the tincture of iodine, according to Mr. J. F. LIVERSEGE, is iodine, 2·47 Gm., potassium iodide, 2·47 Gm., absolute alcohol, 69·56 Gm., and water, 13·25 Gm., or in all 87·75 Gm., in each 100 C.c., and its specific gravity should therefore be 0·8775. Suggestions were made by him to vary the instructions of the B.P. regarding the method of taking the specific gravity and determining the amount of iodine present. Details were also given regarding both the direct and indirect determination of these and other ingredients of the tincture, and tabular statements were submitted to show the results of the analysis of a number of samples.

Calibration of Pipettes. In a paper by Mr. J. F. LIVERSEGE the precautions to be taken before calibrating pipettes were described and the results of a number of determinations were given. It was noted, by the way, that since the grain measure of the British Pharmacopœia is required to be the volume of one grain of water at 15°·5 C., and the fluid ounce is the volume of 437·5 grains of water at 16°·66 C., the latter will measure 437·57 grain measures. The errors in some British pipettes were stated in tabular form, as well as the mean results of the examination of a series of metric pipettes, and a method of approximate correction was described.

Essence of Lemon. The object of Mr. A. A. BARRETT's paper was, in his own words, "to draw attention to the absolute worthlessness of the tests in common use for the examination of the purity of essence of lemon." Rubbing the oil on the hand and smelling it and the use of the polarimeter were both condemned, though it was acknowledged that the latter test had done good work, and "prepared the way for the acceptance of a really scientific test" which, however, remains "to be evolved during the next year or two." Mr. BARRETT has found that genuine essence of lemon may differ in its optical activity between + 57° and + 72°, whilst the addition of per cent. of raw turpentine makes a difference of four or five degrees only in the rotation. The refractometer was also condemned as being of no use in the case of essence of lemon, and the specific gravity test was described as very variable

in its results. Delicate and reliable tests for mineral oil are solution in alcohol and evaporation from paper. A number of empirical tests in use were said to be not worthy of attention, and the direction in which progress is now to be looked for is chemical rather than physical. Some one constituent present in constant proportion in the oil should be selected, and the value of the specimen examined should be based on the determination of this.

Extract of Hemp. A description of extracts of Indian hemp obtained from various sources, Indian Hemp, and comparisons of them with extracts of English origin, were contributed by Mr. DAVID HOOPER, who, in his recent position as analyst to the Indian Hemp Drugs Commission, has enjoyed exceptional opportunities of gathering information concerning the composition of Indian hemp. His paper had particular reference to the pharmacopœial extract, and dealt first with its preparation from different varieties of "ganja," next with its composition, and finally with the examination of commercial extracts. In conclusion, it was stated that many dealers in India renew their stock of "ganja" annually, and always consider the drug worthless after being kept three years. It was suggested, therefore, that the loss of reputation of the extract in England may have been due to failure of action owing to the decomposition of the active principle present.

Election of the whole of the papers having Formulary been disposed of, Mr. LLOYD Committee. WILLIAMS then proposed that the members of the Formulary Committee should be reappointed. This was seconded by Mr. LINFORD, and carried unanimously, and Mr. MARTINDALE returned thanks on behalf of the elected members.

Bell and Hills' Fund. The usual gift of books from the BELL and HILLS' Fund was acknowledged by Mr. DRUCE, who stated that the volumes would be placed in the local municipal library until such time as a pharmaceutical association should be formed at Oxford.

Place of Meeting for 1895. An invitation being received from the chemists of Bournemouth, at the hands of Messrs. BRIDGE and TOONE, for the Conference to assemble there next year, it was unanimously resolved, on the motion of Mr. GERRARD, seconded by Mr. WARD, and supported by the PRESIDENT, to accept it.

Election of Officers. The election of officers was then proceeded with, and resulted as follows:—

President—N. H. Martin, Newcastle-on-Tyne.

Vice-Presidents—M. Carteighe, London; J. Laidlaw Ewing, Edinburgh; W. Hayes, Dublin; J. A. Toone, Bournemouth.

Hon. Treasurer—John Moss, London.

Hon. General Secretaries—W. A. H. Naylor, London; F. Ranson, Hitchin.

Other Members of the Executive Committee—F. C. J. Bird, London; Peter Boa, Edinburgh; G. E. Bridge, Bournemouth; E. H. Farr, Uckfield; J. Hodgkin, London; E. M. Holmes, London; Hy. Mathews, Oxford; W. F. Wells, Dublin; R. Wright, Buxton.

Auditors—C. Clayton, Oxford; F. Spinney, Bournemouth.

Local Secretary—Stewart Hardwick, Bournemouth.

Finally, on the motion of Mr. GROVES, seconded by Mr. JONES, a hearty vote of thanks was awarded to the governing body of Christ Church for the use of the college hall for the reception and conversazione; on the motion of Mr. CARTEIGHE, seconded by Mr. JOE INCE, cordial thanks were accorded the authorities of New College for enabling the garden party to be held in their grounds; and on the motion of Mr. ATKINS, seconded by Mr. JOHN MOSS, the Master and Fellows of Balliol College were similarly thanked for lending their hall for holding the sessions of Conference. The local committee, the PRESIDENT, and the Honorary General Secretaries of the Conference were also thanked for their services, and the proceedings then terminated.

An illustrated record of the proceedings in connection with the social side of the Conference meeting is embodied in the form of an illustrated supplement to the present issue of the Journal. Allusion has already been made to the gratifying success which has attended the efforts the local committee to render this visit to Oxford a memorable and enjoyable one, and fairly favourable state of the weather, on the whole, tended much to assist in this direction, since so many of the principal charms of Oxford are found out of doors. The usual photograph was taken on Wednesday in front of Balliol Hall, and should prove an attractive memento of the beautiful surroundings. The conversazione on Monday, garden party on Tuesday, smoking concert on Wednesday, and river excursion on Thursday were all highly successful, and will doubtless leave many pleasant recollections in the minds of all who were present.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

On Wednesday next, August 8, the British Association will assemble at Oxford for the fourth time. It first met there in the second year of its existence, under the presidency of the Rev. W. BUCKLAND, in 1832. The next meeting in the famous old university city took place in 1874, when Sir ROBERT LEWIS was president, and the third in 1890, when HUXLEY, OWEN, and others gave zest to the proceedings during the discussions on the revolutionary doctrines embodied in the then recently published "*Origin of Species*." The Chancellor

of the University of Oxford, the Marquis of SALISBURY, K.G., will preside over the meeting on the present occasion, and it is anticipated that the attendance will probably reach two thousand. The presidential address will be delivered in the Sheldonian theatre on Wednesday evening, and is expected to deal with some of the great unsolved problems in science. The following are the presidents of the different sections:—Mathematical and Physical Science, Professor A. W. RÜCKER, F.R.S.; Chemistry and Mineralogy, Professor H. B. DIXON, F.R.S.; Geology, Mr. L. FLETCHER, F.R.S.; Biology, Professor I. B. BALFOUR, F.R.S.; Geography, Captain W. J. L. WHARTON, F.R.S.; Economic Science and Statistics, Professor C. F. BASTABLE; Mechanical Science, Professor A. B. W. KENNEDY, F.R.S.; Anthropology, Sir W. H. FLOWER, F.R.S.; and Physiology, Professor E. A. SCHÄFER, F.R.S. Soirées will be held on August 9 and 14, and the concluding meeting on Wednesday, August 15.

THE OXFORD HANDBOOK.

The illustrated handbook on "Oxford and its University" proved an unqualified success, its reception by the members of Conference appearing to fully justify the anticipation that it would add somewhat to the interest of the Oxford meeting. Sir HENRY ACLAND and the MAYOR of Oxford both referred to the book in highly appreciative terms, as did also the President, Mr. MARTIN, at the close of the proceedings on Wednesday, when he quoted with approval, the concluding words of the preface, which stated that the whole of the work in connection with the work had been done in the hope of adding to the success of the Oxford meeting, and further cementing the bonds which unite the British Pharmaceutical Conference with the Pharmaceutical Society of Great Britain and its official organ." Readers who have applied for copies will be supplied in the course of a few days.

MEDICAL GRADUATION.

It is with much pleasure we note that, in the list of those upon whom the degrees of Bachelor of Medicine (M.B.) and Master in Surgery (C.M.) were conferred at Aberdeen University on Friday, July 27, the name appears of ROBERT JOHNSTON, son of Mr. JOHN JOHNSTON, Member of Council of the Pharmaceutical Society.

DR. C. R. A. WRIGHT.

The death of Dr. C. R. A. WRIGHT, lecturer on chemistry at St. Mary's Hospital, will be a source of surprise as well as regret to many readers of this Journal, to whom he was known by his investigations of opium and aconite alkaloids, and as a frequent attendant at pharmaceutical gatherings.

SCIENCE SCHOLARSHIPS.

We are informed that DANIEL HANBURY WHITE, apprentice with Messrs. GILES, SCHACHT AND CO., of Clifton, has recently obtained a JOHN STEWART Scholarship at University College, Bristol. It is to be hoped that this success may foreshadow a career honourable to the memory of the gifted man whose name the scholar bears.

Transactions of the Pharmaceutical Society of Great Britain.

SCHOOL OF PHARMACY PRIZES EXAMINATION QUESTIONS.

Session 1893-94.

SESSIONAL EXAMINATION FOR A SILVER MEDAL AND THREE CERTIFICATES OF HONOUR.

CHEMISTRY.

PROFESSOR DUNSTAN.

Thursday, July 26.—Hours from 10 to 1.

1. Explain precisely what is meant by "reduction" and "oxidation." Classify the following substances into reducing and oxidising agents, giving examples of their action:—hydrogen sulphide, nitric acid, nitrous acid, hydrogen peroxide, hydrogen iodide, hydroxylamine and chromic acid.

2. Describe in detail two distinct methods of separating pure silver from an alloy of silver and copper. How are the following silver and copper compounds prepared, and what are their chief properties:—silver nitrite, cuprous chloride, cuprous oxide, cuprous hydride, and silver sulphate.

3. The same current is passed for the same time through solutions of the following compounds:—hydrogen chloride, silver sulphate, copper sulphate, potassium chloride, lead nitrate. Describe what happens, and state the relative amounts of the products formed at each electrode.

4. Describe the construction of a polariscope, and explain how it is used. What has been ascertained with reference to the relation between the chemical constitution of a substance and the action of a solution of it on the polarised ray?

SESSIONAL EXAMINATION FOR A SILVER MEDAL AND THREE CERTIFICATES OF HONOUR.

CHEMISTRY.

PROFESSOR DUNSTAN.

Thursday, July 26.—Hours from 2 to 5.

1. Trace the similarities and differences between the following pairs of organic compounds:—benzoic acid and acetic acid; ethylamine and aniline; phenol and alcohol; acetic aldehyde and benzoic aldehyde.

2. Give an account of the chief differences between aldehydes and ketones. Classify the following compounds, giving your reason in each case:—acetone, camphor, dextrose, levulose, oil of meadow sweet, oil of bitter almonds.

3. Describe, with equations, the action of chlorine on ethyl alcohol and on acetic aldehyde. What are the chief properties of the products?

4. Explain the relation of the following vegetable alkaloids to pyridine:—Piperine, atropine, nicotine, and conine.

QUESTIONS FOR THE TERMINAL EXAMINATION IN THE CLASS OF

PRACTICAL CHEMISTRY.

PROFESSOR ATTFIELD.

Friday, July 27.—Hours from 10 to 1 and 2 to 5.

Books and Memoranda permitted.

Manipulation as well as results will be scrutinised.

1. Ascertain the specific gravity and yield of nitric oxide of the sample of "Spirit of Nitrous Ether," and give the results in figures.

2. What substances are present in the fluid "A?"

3. Name the substances "X," "Y," "Z."

4. A single poison is present in "The Flour." State its name.

MATERIA MEDICA.

PRACTICAL HISTOLOGY.

SESSIONAL EXAMINATION FOR A SILVER MEDAL.

Saturday, July 28.—Hours from 10 to 1.

PROFESSOR HENRY G. GREENISH.

1. By what reagents would you distinguish—

- (a) Lignified and
- (b) Suberized cell-walls from each other and from pure cellulose? How would you identify
- (c) Calcium oxalate,
- (d) Mucilage,
- (e) Inulin,
- (f) Oil, microchemically?

2. Examine and describe the structure of the drug submitted to you (oak-bark); cut such sections and apply such reagents as you consider necessary; illustrate your description with sketches, and leave a transverse section mounted in glycerin for inspection.

Scottish Transactions

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The fifth and last botanical excursion of the season took place on Wednesday, July 18, to Inveresk, leaving Waverley Station by train at 8.15 p.m. Arrived at Inveresk, the company walked down the valley of the Esk to Musselburgh, and returned to town by train at 10.50 p.m. One notable feature in the flora of the valley was the great profusion of *Scrophularia nodosa*. Some fine specimens of *Pyrethrum parthenium* with yellow foliage were also met with, apparently an escape from some garden higher up the river. The excursion was conducted by Mr. Alexander Sutherland, President.

British Pharmaceutical Conference.

MEETING AT OXFORD.

The business of the thirty-first annual meeting of the Conference commenced on Tuesday, July 31, in the Hall of Balliol, the chair being taken by the President, Dr. N. H. MARTIN, F.L.S., F.R.M.S. He was supported by the Mayor of Oxford, the Master of Balliol, and Sir Henry Acland, Bart., K.O.B.

The MASTER of BALLIOL (Dr. Edward Caird) opened the proceedings by welcoming the Conference to the Hall of Balliol, which, he said, could not be put to better use than to serve as the meeting place of conferences such as this, in which those engaged on any particular subject met together to exchange their views, to compare notes, and so to advance the subject in which they were interested.

The MAYOR of OXFORD next, in the name of the citizens, extended a welcome to the Conference to the ancient city, in which during the last quarter of a century he said there had been a growing custom year by year to receive deputations and conferences of visitors representing the learned societies of England. He hoped that these meetings would continue to be held from time to time and result in much good, and that, on the other hand, the visitors would find much to interest them, and would go away with kindly recollections of the city of Oxford.

Sir HENRY ACLAND, Bart., said he was very grateful for the opportunity of being present at this Conference. He was not officially deputed by the authorities of the University to welcome them, but it was his duty to do so, on the part of the University, so far as he might, but beyond that, on behalf of the nation and of science. The President and many present were aware that the whole question of science, particularly medical science, and along with it the question of scientific pharmacy, was undergoing a change and going through a process of enlargement which the world had never before seen. This depended on various causes—on the progress of biology, and on the broad views taken of the whole nature of life upon our planet—and attention was now being given throughout the world not so much to the treatment of disease as to the prevention of it. This was a point which he might not have mentioned but for the fact being clearly mentioned in the 'Extra Pharmacopœia,' and as reference was made to the fact that already in this country pharmacists were considering the relation of bacteriological studies to the treatment of disease. This, of course, looking at pharmacy from the artistic rather than the scientific side, raised the question how the line was to be drawn between the preparation of those things which would be required in the future from the few old-fashioned remedies which he remembered in his youth. To pursue this subject further would take too long, but he hoped to hear something upon it in the course of the meeting, but he would repeat that this was not only a national question for England, but for the whole world, as was shown by the congresses held, or being held, at Chicago, Japan, and Baden-Pfeud for the prevention of disease. As he said at the Pharmaceutical Society, in London several years ago, he owed a life-long debt to English pharmacists. When he was at the commencement of his education—he hoped he had not yet completed it—at a great London medical school, in 1840, there was no popular teaching of pharmacy, and he late Peter Squire, who would not take pupils, made an exception in his case, and allowed him the run of the house from cellar to attic, so that he had the opportunity of seeing every process that went on in that establishment. The following year he found there was no teaching of practical chemistry, and

another member of the pharmaceutical body, Mr. Lloyd Bullock, the friend of Liebig, and the translator of Fresenius, in the little laboratory at the back of what was called his shop, worked with him for several weeks, instructed, scolded and taught in a way that could not be surpassed. He had a life-long affection for those two men and a deep feeling of gratitude, which it was his bounden duty, as well as his pleasure, to acknowledge. He learned from those two men a great deal more than the elements of scientific chemistry and pharmacy; he saw the value of character, for he would undertake to say that Peter Squire, so far as his knowledge went, never had anything in his place but what he believed to be of the very best; and he had seen Mr. Bullock throw away a whole evaporating dish of ammonio-citrate of iron which he thought had not been properly made. Beyond education and science, personal character was of the highest importance, and should always be so regarded.

The PRESIDENT, in the name of the Conference, thanked the Master of Balliol, the Mayor, and Sir H. Acland for the welcome they had extended. It was a great pleasure to be so kindly received by a man who was known to be the rejuvenator or re-creator of the teaching of natural science in connection with the University, seeing that natural science was the foundation of pharmacy. He hoped what had been said by Sir H. Acland would sink into their minds, and he should like to emphasise one word he had used on those who had to do with the teaching of young men. Sir Henry said that his own early education included scolding, and he feared that in the present day there was far too much petting and bribing and hardly enough scolding. He entirely agreed with what he said about bacteriology, and, in connection with one of the papers about to be read, he intended to have said, what had now been said in effect by so much higher an authority, that the chemist and druggist of the future would have to be a man who could not only make tincture of rhubarb, but could make a culture of scarlet fever when it was required to treat a scarlet fever case. He must be a scientist and be able to prepare and guarantee all the products he handed to the physician for the treatment of disease.

The PRESIDENT then delivered his address.

THE PRESIDENT'S ADDRESS.

Gentlemen,—At the outset of my address I desire to conform to a custom which I think we do well to honour, and that is to express to you my sense of the distinction which you have conferred upon me by electing me to be your President. To be thought by my *confrères* to be fitted in some small degree to stand in the place which has been occupied and adorned by such distinguished men and pharmacists as Deane, Hanbury, Stoddart, Brady, Redwood, and others who have occupied this chair, is a sufficient cause for modest and honourable self-respect, and I should not be human if I did not appreciate that honour, and feel proud of the dignity. I do not propose to occupy your time by expressions about my own unworthiness, for although the fact, and the causes of it, are better known to me than they can possibly be to you, the attempt to put them into words would miss that ring of true sincerity which I have tried to make the touchstone of my life. I prefer to accept your decision in silence as to my own shortcomings, and to tell you that since your choice has fallen on me, I have done my best to make my unworthiness more worthy of your acceptance.

As you are all aware, we are indebted to the courteous invitation of the pharmacists of this city and neighbourhood for our meeting here to-day, and I congratulate the Conference upon the opportunity of assembling for the first time in its history in this ancient university city.

Oxford is as fresh to me as I have no doubt it is to many of you, but we shall every one of us share an Englishman's just pride in the renown of this historic seat of learning. Perhaps to some of us it was a dream and a hope of our early days that our own education would have embraced an Oxford or Cambridge career, but such dream may have been rudely dispelled by the force of circumstances, and the ideal of education which we thought could have been obtained here, by the culture of surroundings, we have only been able to seek after by much plodding and gleaning in outside fields. If I were free to occupy your time with thoughts other than those connected with pharmacy, what a fruitful source of inspiration this place would be. The beauty and the history of its buildings, the men who have walked these streets and lingered in these ancient halls and colleges, and who have gone out from here to influence so profoundly the whole history of the world, would indeed furnish any audience of Englishmen with food for profitable meditation. In our thoughts about Oxford most of us will have connected it with classical and mathematical studies, and with the remembrance that here have been trained some of the deep thinkers in the realms of philosophy, of theology, and of history. To us as pharmacists, however, and as workers in the domain of natural history and science, the Oxford Museum cannot fail to be an object of the deepest interest, and while I hope you will take away from Oxford many delightful mental pictures of art, of architecture, and of natural beauty, I would commend the museum and all that pertains to it to your most thoughtful attention and study. I may not linger here, but I should like to point out the wide difference which exists between the Oxford Museum and our ordinary conception—and, I am afraid I must add, our experience—of museums in general. In the dictionary you will find a museum defined as a "repository of interesting objects," and in too many cases in this country they are "repositories," and nothing more. Here, however, you will find the museum is not the grave of curious and interesting specimens, but is the centre of a vital contact with nature and science. You will find the museum proper surrounded by suitable buildings and by every provision for education, for study, and for research in the various branches of natural science, and the objects in the museum are used to fulfil their proper function in illustrating the lectures of the professors and enriching the knowledge of the students. In my own city we have a natural history museum, rich in specimens, and we have colleges of science and of medicine, under wholly different management, at no great distance, and every lover of scientific truth in the North must regret with me that the dry bones of the museum are not vivified by contact with the living teachers and students of science. It is an evidence of the clear

judgment and breadth of view which university life and training imparts, that here in Oxford the museum has not been conceived in the spirit of the miser, to collect and to hoard, but the collections are used to communicate pure streams of accurate knowledge to all who will come and drink at this fountain. You will see that medicine forms no inconsiderable part of the teaching associated with the museum, but according to Sir Henry Acland "the function of the Oxford Museum towards medicine is to train good scientific observers and thinkers to become observers and thinkers in pathological and therapeutic and preventive processes." I trust it is not a mere dream to hope that some day pharmacists will be found here amongst the students laying the foundation to become "good scientific observers and thinkers."

The subject of my address will be medicine and pharmacy, and however well the story of these may have been told by my predecessors, I am by virtue of my position under the necessity of keeping to the beaten track, and I have no desire even to shirk the responsibility. I purpose to take full advantage of my position as your President and to speak to you *in cathedra*. I do not expect that you who hear me, or that those who may afterwards read what I shall say, will agree with all that I express, but of one thing I beg to assure you, my views upon this subject have not been hastily adopted, and they are not lightly held. They are the outcome of more than thirty years of a wide contact with pharmacy and medicine, and of loving service to pharmacy, which during that period has been to me not alone a source of income, but the means of bringing me into contact with a large proportion of the purest pleasures that have come into my life.

It is not possible to exaggerate the importance of medicine and pharmacy in the body politic. The duty of healing and caring for the sick should call forth in every right-minded man with the spirit of true nobility in his soul, feelings of the highest chivalry and honour, and he is surely one of the most miserable of human beings who is satisfied to pursue these callings for mere gain, and to measure the success or failure of his life devoted to medicine by a money standard.

Our own daily work and our thoughts are more intimately connected with pharmacy, but we meet medicine on the common ground of drugs, their preparation and application in the treatment of disease. Medicine in the persons of those who practise it, and in the pages of its representative journals, does not hesitate to criticise and even to castigate pharmacy, and I propose to extend my remarks to revealing shortcomings in the practice of medicine.

Let us turn first, however, to pharmacy, and ask the question whether in its own special domain its condition is satisfactory, and, if not, what is the cause of this, and what suggestions for its improvement can be offered. The Pharmaceutical Society has had its existence of over fifty years, and we have had a compulsory Act of Parliament for twenty-six years. In that period advances have been made which are obvious, and I need not recount them any more than

I need place before you confirmatory evidence of the fact that the majority of those who are on the Register of Chemists and Druggists are dissatisfied with the actual practice of pharmacy to-day. Complaints are loud and deep against the Pharmaceutical Society because it does not bring about an improved condition of things, but in no case have I seen the confession by any large section of men on the Register that they have failed to realise the privileged position in which they were placed by the Act of 1868, and that they have neglected to conform to the keynote and true spirit of that Act, which was—education. I think you will agree with me that the greatest evil from which pharmacy is suffering to-day—unbridled and dishonest competition in prices—is mainly due to the enormous extent to which the use of proprietary medicines has increased, and to the fact that this has played the rôle of introducing grocers, limited companies, and other unqualified and unregistered individuals and bodies to assist in their distribution, and has tempted them to add to their sale a large number of the drugs in common use, and finally has evolved that monstrosity of the nineteenth century, the “company pharmacist.” Who is to blame for this? Surely not the Pharmaceutical Society, for whatever individuals may have done, the whole spirit and teaching of the Society is in direct opposition to pharmacists becoming the medium of distributing articles about which they have absolutely no personal knowledge, and about which they can give neither to physician nor to patient any information based upon their scientific training and experience as pharmacists. No, it is not the Pharmaceutical Society which is to blame, but it is the men on the register who, in the past, in their several localities, by their endorsement of the falsehoods of these advertising quacks, have created on the part of the public this enormous and unhealthy demand for proprietary medicines, and have brought this Nemesis upon pharmacy.

Here I must mention a further development of the proprietary medicine system which has recently taken place, and which is fraught with far more peril to the existence of pharmacy than the proprietaries for domestic use, and in this both medicine and pharmacy have been enmeshed by the wily commercial adventurer. In various guises, and by persistently advertising claims to improvements in pharmacy, men, seeking gold, have induced medicine and pharmacy to become their tools to enable them to reach the million. There are two chief methods by which this has been accomplished; one is by the registration of a word for some particular form in which drugs may be administered, the other is by the invention of names (“discretionary names” I see one medical writer euphemistically calls them) which are used as blinds to suggest some original or added virtue, for compounds, the properties of the ingredients of which are perfectly well known. These enterprises would have met but with poor success if medical men and the medical journals had been true to themselves and to their own teaching. You can imagine the incredulous smile with which an accomplished physician would receive the assertion of some antiquated herbalist that he knew

a weed which was an universal cure, but when such a weed is made the basis and furnishes the name to a compound manufactured by an enterprising company, and is presented to him with a sample bottle, a pamphlet bristling with comments from medical journals and testimonials, under the name of Liquor Curaline Co., the amiable physician falls into the trap, and his next patient is dosed with the latest improvement in modern pharmacy—“Liq. Cure-all-line Co.” The medical journals, however, in their advertising columns and in their literary pages are the strongest supporters of these quackeries. I do not suggest, and it would be preposterous to suppose that the learned and versatile editor of the *British Medical Journal* would listen to an appeal of this sort.

“Dear Sir,—Advertising as we do in your valuable and esteemed medium, and being likely to continue the same in the future on an extensive and liberal scale, we shall esteem it a favour if you will kindly give us at an early date the superadded benefit of a free editorial, the substance of which we beg respectfully to submit herewith.—We are, dear Sir, yours faithfully, Bunkum, Quack and Co.” There cannot be the slightest doubt of the reception which such a letter and such an appeal would get at the hands of the editors and proprietors of our leading medical journals. But let B. Q. and Co. approach the matter by advertising on an extensive scale in the Journal, and then send samples for analysis and report, and if we read nothing stronger it will at least come out something after the following:—

Skininaline.

“It is claimed that the substance contains the active principles of skin in the proportion of twenty grains to the pound. We have put these claims to the test as far as possible, and we are satisfied that they are practically justifiable, but we are not able to endorse all that the discoverer claims for the preparation, although there is no reason to doubt his statements.” To the stern logic of science, this is lukewarm enough in all conscience, but the astute advertiser is satisfied. He probably did not expect what was impossible, any definite analysis and report, but he knows, cautiously worded and valueless as the paragraph is as to the merits of skininaline, he has only to quote the paragraph and add the magic words of the title of the journal, and the commercial result to him will be increased a hundredfold. I venture to assert that such notices are absolutely unworthy of the highest and best traditions of medical journalism, and they are the ruin of scientific medicine and pharmacy. I could give you many illustrations, but forbear to weary you. I believe the Americans were the first to make the discovery that the doctor might be made a cheap and efficient means of advertising, although the Germans have not unsuccessfully cultivated the same field, and it is to this source that we owe the experience that the consulting rooms of the medical practitioner are deluged with “physician’s samples” of the most arrant quackery the world has ever seen. When will English medicine have the courage to purge itself of this corruption?

It will be interesting I think to enquire into the

possible reasons why medical men have so readily fallen into these traps, and I think one great and most important cause has been the neglect to give the medical student adequate training in the knowledge of the properties and uses of drugs. Since the abolition of apprenticeship to a general practitioner, which used to precede in medical education the scientific course which in those days was called "walking the hospitals," the tendency has been for more and more of the medical student's time to be taken up with the abstract sciences which are the basis of his art, and the practical side of being able to treat and cure disease by the intelligent use of medicines has been very largely neglected. The result is that instead of the diagnosis and the cure going together in intelligent connection, they have been separated from each other, and it has happened to a brilliant and successful student of our medical colleges that, after having made the most exact diagnosis, the limit of his powers has been reached, and his grim function has been to watch the patient die, and to be able to predict the precise pathological changes which would be revealed at the necropsy. Another great cause, which I am sure has had a wider influence in discrediting the use of drugs in the treatment of disease than we can have any idea of, is the tender system under which many hospitals and infirmaries—where young men get their first lessons—are supplied with drugs. It is no secret that large quantities of inferior and almost useless drugs are year by year placed on the market, and I do not think it is in the least unfair or unjust to infer that these must largely find their way into the institutions and into the possession of those who make the price their sole criterion of value. It follows, quite in logical sequence, that teachers and taught are influenced by the variable and uncertain results obtained, and that sometimes in despair and sometimes in contempt there is produced a lack of faith in drugs as instruments of healing. I do not underrate in the smallest degree the importance of the medical student acquiring sound and extensive knowledge of physiology, pathology, and so forth; they are absolutely essential subjects, and I would not belittle the triumphs and advances which recent years have seen in these directions, but the subject of profound importance to the patient is to be cured. The exorbitant claims sometimes advanced on behalf of such subjects as physiology, pathology, and chemistry have been fraught with no little danger to the art and practice of medicine, and it has happened that many a general practitioner, who in the realm of physical danger would be a hero, has been deterred by a sneer or an assumption of superiority on the part of some specialism from contending for the reality of the knowledge which is the result of his own life-long experience in the use of drugs, and the knowledge itself has, in some cases, been lost to the service of medicine in its combat with disease.

To return to pharmacy, the small amount of relative success which has resulted from the work of the Pharmaceutical Society, is in my opinion largely due to the grave mistake which was made in the fifth clause of the Pharmacy Act, 1868. By that clause it

was decided to place on the register, without examination and without fee, all who claimed to have been in business as chemists and druggists prior to December 31, 1868. If an adequate fee for this privilege of being registered had been imposed, I think it would have had the effect of considerably reducing the number of those who desired to be placed on the register from purely trade motives, and it would have created in the minds of those who were registered a wholesome feeling of respect for the body to which it had cost something to become affiliated. The result was that a large number of persons were placed upon the register who were actually antagonistic to, and were active propagandists against the educational standards of the Society. It was probably thought that in the course of a generation these men would all die off, and that when the register was composed entirely of men who had been placed there as the result of examination (again without a fee, I regret to say) a different spirit would prevail. But unfortunately our experience has shown it to be otherwise, and the baneful influence of the trade element is still predominant on the register, to such an extent that it has captivated the judgment of some prominent men in the Society itself, and threatens to overthrow the very principle upon which the Pharmacy Act was obtained.

Pharmacy, as practised by the registered chemists and druggists of this country, is attempting an impossibility; it is seeking to grasp the commercial advantages, which in other callings can be obtained by the exercise of legitimate trade, whilst it desires to retain the rewards which properly belong to professional services. This cannot go on much longer, and pharmacy must make its choice between trade and profession, but before I indicate in which direction I think the choice should be, let me briefly mention one or more of the prominent features which characterise the two.

The very essence of trade is that it is capable of indefinite expansion, and there is no limit to the extent to which a tradesman may sell his goods at the hands of assistants or through the agency of any number of intermediate persons between himself and the user of the article he sells. Apply this test to pharmacy, and you will see it is impossible for it to expand indefinitely in the fulfilment of its own proper functions, of dispensing the prescriptions which the physician has written for the individual patient, or prescribing for the smaller accidents and ailments to which human beings are liable. There will perhaps spring into your minds instances of the indefinite expansion which has followed the advertising of nostrums, but that is not pharmacy, but in many cases is merely obtaining money under false pretences. You all know Jerome's friend who visited the British Museum to read up the treatment for "hay fever," and plodding conscientiously through the book from A to Z found that the only complaint he had not got was "housemaid's knee," and so it is with nostrums. The complaint is, more often than not, suggested by the literature of the nostrum-monger before the nostrum effects the wonderful cure which is recorded in the testimonial.

The essence of a profession, on the other hand, is that the members of it receive a special education, and give evidence before a legally constituted body that they have been so educated; that the service rendered is personal and direct, and cannot legitimately be multiplied indefinitely through the agency of unqualified persons.

Tried by these criteria, I think you will agree that pharmacy, in the exercise of its legitimate function towards the public, is a profession and is not a trade. English people through their Legislature admitted this in 1868 when, by statute, they laid down the conditions upon which pharmacy should be carried on, and imposed restrictions of a similar kind to those which had before that belonged to the other professions, and which were not and are not imposed upon any trade. How does it happen that the very essence of pharmacy being a profession, that the Pharmaceutical Society and the Legislature having decided, in effect, that it is a profession, we seem as far off as ever from it being practically recognised as such by the pharmacist and the public? It is due to the excessive preponderance of the trade element and of the commercial spirit amongst the registered men. This has handicapped the Pharmaceutical Society and rendered it impossible for the Society to advance upon the lines and in the spirit of the Pharmacy Act. We have seen the kindred profession of medicine increase its curriculum, or period of compulsory training, from three to four years, and again to five years, and in so doing it has steadily and deservedly risen in public esteem and respect, whilst notwithstanding the convictions and earnest desire of the Pharmaceutical Society, we have as yet no curriculum at all, and the voluntary training (for our examination) which our young men undergo, in a vast majority of cases, cannot be described by any less objectionable word than that of cram. The consequence is, that notwithstanding that the English people were willing to accept pharmacy as, and to give it the opportunities of, a profession in 1868, they are almost compelled in 1894, by the conduct of those who practice it, to come to the decision that pharmacy is nothing but a trade after all, and so it comes to pass that the grocer and the company pharmacist are so far on the road to win the rights and the privileges which belong to pharmacy. Pharmacy as a trade is a failure, and I go further and say that pharmacy, as well as medicine, conducted as a trade and in the spirit of a commercial venture ought to fail. If we use our knowledge to exploit human ailments, to excite men's fears and to play upon human credulity for gain, we ought most ignominiously to fail. You will be prepared to hear that my own strong conviction is that pharmacy should realise its privilege and seriously proceed to take steps to accept its responsibilities as a profession, and no time should be lost in setting about it. I will only very briefly indicate the steps which are necessary, and trouble you as little as may be with small details. Our entrance examination should be made a much more stringent test of a young man's intellectual powers and of his school training than it is. It is useless to expect men to be able to grasp the problems

of organic chemistry whose knowledge of mathematics has not gone beyond the simple arithmetic which our present examination requires. This examination should include algebra and geometry, the Latin should be extended to a knowledge of the selected authors beyond a mere cram of the meaning of words, history and geography, and a modern language should be included, and the examination should be passed not earlier than at seventeen years of age, but before apprenticeship. Following this should come three years of actual (not nominal) apprenticeship, during which the powers of observation should be cultivated, and by continual exercise in the practical operations of pharmacy, under suitable instruction, all that dexterity of manipulation and that wise caution in handling things which is a characteristic of the trained pharmacist, should be acquired. A large amount of knowledge of the physical characters of drugs and preparations would necessarily be obtained during this period, and the apprentice, whose mind was in his work, would certainly do some reading in connection with it. Then should come the curriculum, or the period of enforced study, upon a syllabus taught in recognised colleges and schools throughout the country; this period should not be for less than two years, and the whole time of the student should be engaged in training and preparing for the work of his life. During this two years, at certain intervals the progress of the student should be officially ascertained, and at the end, his fitness to become a pharmacist should be tested by one week or more of examination, written, oral and practical, in the subjects of botany, chemistry and materia medica; and if the result was satisfactory, I would give the qualification and title of pharmacist. The training and examination should take the student at least as far—I should advocate further in some directions—as our Major examination, and I would abolish all intermediate names which even suggest qualification. When the pharmacist has undergone this, as a minimum of his training and proof of his qualification, I think he will have some right to consider himself, and to be considered by the public, a professional man. But now will arise in your minds the question that having elevated your pharmacist to the status of a professional man, what is he to do, and how is he to live? Medical men, to an enormous extent, dispense the prescriptions for their own patients, and they are exceedingly emphatic in their protest against the pharmacist prescribing.

The treatment and cure of disease are the legitimate functions of medicine and pharmacy in co-operation, and no rigid line of demarcation is possible. Broadly, the operations of surgery, the diagnosis of disease and prescribing belong to medicine, and the preparation and dispensing of the remedies to be used in the treatment of disease belong to pharmacy.

Doctor's dispensing is stated by many to be one of the chief, if not the chief cause of the ills from which pharmacy is a sufferer, and demands in more or less dignified terms are made that this iniquity shall cease. I make no apology for the existence of this condition of things. Theoretically it is undoubtedly better that dispensing shall be done by the

pharmacist, and prescribing by the medical man, but when we pharmacists claim this as a right and accuse medicine of unjustly usurping our functions, it is well for us to remind ourselves that medical men, although they may not now as frequently as of old take the degree of L.S.A., are the direct and legitimate successors of the old apothecary, and that the dispensing of medicine was their legitimate function. So much was this the case, that there being a doubt as to whether it was traversed by our own Act of 1868, the short Act of 1869 was passed to preserve the right. Then again it is deep rooted in the habits of the English people to expect the doctor to supply the medicine he has prescribed, and any change can only come about by the slow process of educating the patients, and by the exhibition of good will and feeling between medicine and pharmacy. Before it can happen universally, there is no doubt that pharmacy must have acquired such a professional standing and education as will enable it to perform its delicate and confidential function with the tact and reserve which is the outcome of prolonged training. The mistake (a very common one) which pharmacy is making is, that it wants the reward before it has made the effort and suitably equipped itself for the service. I exhort the pharmacist of the future to be unremitting in his efforts to raise himself and his calling to a professional status, and then I predict for him that in the natural course the dispensing of medicines will come to him.

Chemist's prescribing is quite as loudly complained of by the doctors, and when I read some of the letters and comments which appear in the medical journals I am almost tempted to fear that for once medicine is thinking more of its share of the pecuniary reward than caring for suffering humanity. There is, however, I am sorry to say, a great deal too much prescribing by chemists, and some of it is of a most reprehensible kind. I know a case where a chemist treated a man suffering from rodent ulcer of the face for two years, all the time buoying the man up with the hope that it was getting better, and that he would cure it, until the face was so bad and the ulcer had spread to such an extent that, when it came under the notice of the surgeon, nothing could be done for the patient. If that chemist had met the man upon the highway and robbed him, he would have been liable to imprisonment; but having got the man into his shop, he not only robbed him of his money, but he rendered it impossible for the man ever again to be restored to health. For the dishonour which such men bring upon pharmacy, and for the irreparable injury which they inflict upon suffering humanity, I should like to give them several years of penal servitude. But there are innumerable small accidents and little ailments to which humanity is liable which quite legitimately come within the province of pharmacy to treat, and the pharmacist, if he is wise, is a much safer man to treat these than the clergy and the laity, who are ever ready to prescribe for each other upon any and all occasions. The best and wisest exponents of medicine admit this right on the part of pharmacy, and welcome the service which is rendered by it to sufferers. Pharmacy may make some mistakes, but I know it

frequently sends patients to medicine long before they or their friends would think seriously enough of the case to do so.

There should be no rivalries or jealousies between medicine and pharmacy, and the better qualified each of these may be to exercise its own share of the duties devolving upon both, the more will each of them respect the rights and the work of the other.

Before I conclude, one word on the principle upon which remuneration should be based. This is a question of the utmost importance to the English public, as well as to pharmacists. John Ruskin says, "You do not pay judges large salaries because the same amount of work could not be purchased for a smaller sum, but that you may give them enough to render them superior to the temptation of selling justice." We cannot err in applying this principle to pharmacy, and deciding that the dispensing chemist must be paid at a rate of remuneration which will enable him to get his living honestly and openly, and render him superior to the temptation to increase his profit and his income by tampering in ever so small a degree with the quality of the drugs he uses, and with the health and may be the lives of dear ones and of men important to the community. His remuneration should also enable him to devote sufficient time and care to every detail of his responsible work, and eliminate a very real source of danger which is unavoidable if the haste and the bustle of trade methods are adopted by pharmacy.

The Conference has entered upon the fourth decade of its existence, and possibly I should have made a better and wiser choice if I had addressed you upon its past achievements and its future prospects, but the other matters upon which I have touched have seemed to me of greater importance. Let me say, however, briefly, that I think the record of this Conference has been eminently an honourable one, and that it has fulfilled in a high degree the functions for which it was called into existence. The story is written in the Year Books, and another phase of it is engraved in the hearts and memories of many of us who have been members almost from the beginning and who have attended a large number of its meetings. It has added to our knowledge, enlarged our experience, and broadened our intellectual grasp of pharmacy, and last, but not least, it has been the means of bringing together, introducing to each other, and cementing friendships between men who practice a common avocation in districts as wide apart as Inverness and Cornwall. In this latter function the excursion on the last day has played no inconsiderable part. Amongst the critics of the Conference there are some persons who affect to sneer at the excursion as if it were sheer frivolity, and was at variance with the avowed scientific objects of the Conference. I beg to differ, and to claim for the excursion day a very high place in the work of the Conference. It affords the opportunity, as no other arrangement could do so well, for men to meet; and I am quite sure that my own experience is by no means singular when I tell you that many, very many, of the best friends I have in pharmacy

were first known to me through the opportunity of one of the Conference excursions, and, further, I could not exaggerate to you the benefit which I have received from the numerous conversations and informal discussions which always take place on those days. But it is with societies as with individuals, they tend to decay, and already more than once we have the alarm—the Conference is on its last legs! I do not believe it, as I feel sure it fulfils a purpose in the realm of pharmacy which is too important for the Conference to be left to decay, and that if we neglect the trust which has been handed down to us, our successors will revive it. I would ask every member of the Conference to get at least one other member to join, and I do not think he can use a stronger argument than that, apart from the opportunity of attending and taking part in this annual scientific gathering of pharmacy, the 'Year-Book' which he will receive is worth many times the subscription. The 'Year-Book of Pharmacy' should find a place on the desk of every chemist and druggist in this land. In it he will find abstracts of papers from a larger number of sources than he can possibly consult for himself, and many of these papers may be of great value to him.

There is no occasion to disguise the fact that we do not get as many, or possibly as good, papers sent to the Conference as we should like, but when we consider the needs of a weekly press and the number of small societies, which absorb in the aggregate a large number of papers, our experience need cause us neither surprise nor alarm. I should like, however, to ask many of those who are doing original work, and writing papers in connection with pharmacy, to consider whether there is any place so suitable for them to be read as at these meetings. The authors may feel certain of a larger audience to listen to their papers, and a far more capable set of men to discuss them than can be found at any other time or place. In provincial towns the papers are read to a few local men, and the discussion is taken part in by fewer still, and even at the monthly meetings at Bloomsbury Square the discussions have a great tendency to fall into the hands of very few men. However capable these men may be, they cannot possibly have the wide and varied experience of the aggregate of the men who attend this Conference. I would therefore venture to urge thoughtful pharmacists to contribute papers to this Conference, and I should like them to come in such numbers, that we may be compelled to add another day or two to our meeting.

I mentioned just now the friends whom we have made at these Conference meetings, and before I close I must briefly allude to those we have lost. The first name that will occur to you, I am sure, is that of our genial botanist, the late Professor Bentley, who was President at Nottingham in 1866, and in Dundee in 1867. Many of us knew him first and best at Bloomsbury Square as our dear and honoured teacher, but to many others the Conference must have been the means of their meeting him, and by all was he respected and beloved. He had reached a good ripe age, and of him it might be said—as of many other men who have lived and been true to themselves and

their calling—"He has done his work well and earned his rest." The next, an even greater loss to us as a Conference, because of his younger age, and the promise there was in him of greater achievements for pharmacy, is our late Treasurer, Mr. R. H. Davies. I, with many others, made his acquaintance through this Conference, and I feel, as I am sure many of you do, that I have lost a personal friend with whom intimacy would have ripened year by year into stronger bonds.

Gentlemen, in conclusion, during the important business of the next two days I am your chairman and presiding officer, and in exercising the functions of that office, I will endeavour to secure a fair hearing for the many-sided opinions, which in the discussions on the papers are sure to find expression, but I should be afraid of the position if I did not know that the honour of this Conference as a whole is as dear as personal honour to every member of it, and that in those discussions no member will withhold facts which he may be able to contribute to the better understanding of the papers.

Mr. MICHAEL CARTEIGNE, in proposing a vote of thanks to the President for his address, said there was a special fitness in Mr. Martin occupying that position, since he did not think they had had a Newcastle man at the head of affairs since Mr. H. B. Brady, when the Conference was founded. Two out of the three founders were present to-day, Mr. Reynolds and Mr. Schacht, the latter having, he believed, the honour of having first suggested the idea of holding such annual meetings. He had never listened to an address with so much interest as he had that morning. They had had many extremely valuable addresses, some on scientific subjects, others on education, and others on sectional subjects, but at no time within its history had the Conference had put before it a few plain facts so tersely and plainly. If there was one thing he appreciated it was to see a man occupying a position of this kind who had an individuality and backbone. The characteristic of this address was manliness from beginning to end. Mr. Martin had spoken plainly, not of their virtues only, but of their faults and failings, and of the difficulties, largely due to ignorance, which beset the path of pharmacy. It was not his part to criticise or comment on the address, but he might say that he thoroughly agreed with what had been said as to the relation between medicine and pharmacy. It was a fact patent to all intelligent men, not necessarily pharmacists, that in many cases the man of medicine could not prescribe. He begged to move a hearty vote of thanks to the President for his admirable address.

Mr. G. C. DRUCE having seconded the motion, Sir HENRY ACLAND said there was one matter he had forgotten to mention before. They often heard that they were in a state of evolution, but that there was a process of evolution backwards as well as forwards; in pharmacy, however, as far as he could judge, after listening to the President's address, the evolution was forward. When they visited the Museum they would see that the University had within the last three or four years established a special reader in *materia medica*, pharmacy, or pharmacology, whichever it might be called; and he would point out that it would be very difficult to define the limits between those three subjects, and that one of the great difficulties of the future was how far experiments on living animals, and so on, should form part of the necessary studies of students.

Whether in pharmacy and materia medica, or whether only in medicine, knowledge would go on, but one person could not hold it all. Still, the University had very properly instituted a special course of materia medica, and he was sure they would all be glad to hear that Dr. Lauder Brunton had been appointed Examiner.

The motion was put by Mr. Cartelghe and carried unanimously.

The PRESIDENT, in acknowledging the vote of thanks, said he was aware that of late years the medical curriculum included a clinical study of drugs; but there was a time when the knowledge of drugs was to the medical student a minus quantity. It seemed to him of vital importance that whatever else a man knew, he ought to know something about the treatment and cure of the patient he visited.

RECEPTION OF DELEGATES.

Mr. W. A. H. NAYLOR (Hon. Sec.) then read the following list of delegates:—

Pharmaceutical Society of Great Britain.—Messrs. M. Cartelghe (President), W. G. Cross (Vice-President), R. Hampson (Treasurer), Messrs. Atkins, Bottle, Gostling, Grose, Hills, Martin, Martindale, Schacht, Southall, and Young; the Editor, Sub-Editor, and Secretary.

North British Branch.—Messrs. J. Laidlaw Ewing (Chairman), C. Kerr (Vice-President), Currie, Davidson, Gibson, Lunan, and Maben.

Pharmaceutical Society of Ireland.—Messrs. G. D. Beggs (Vice-President), Conyngham, and Wells, jun.

Aberdeen and North of Scotland Society of Chemists and Druggists.—Messrs. Johnston, Kay, and Paterson.

Brighton Association of Pharmacy.—Messrs. W. H. Gibson (President) and W. W. Savage.

Leeds Chemists' Association.—Messrs. R. Reynolds (President) and G. Ward.

Liverpool Chemists' Association.—Messrs. Conroy, Smith, Symes, and A. S. Buck.

London Chemists' Assistants' Association.—Messrs. Gane, Harrison, Jones, Parry and Strother.

Sunderland Chemists' Association.—Messrs. Harrison and Ranken.

Manchester Pharmaceutical Association.—Messrs. Cooper, Kemp and Johnstone.

Nottingham and Notts Chemists' Association.—Mr. C. A. Bolton.

Glasgow and West of Scotland Pharmaceutical Association.—Messrs. W. L. Currie (President) and A. Kinninmont.

Midland Pharmaceutical Association.—Messrs. R. D. Gibbs (President), F. G. Gibson (Vice-President), Prosser, Alcock, Perry, A. Southall, C. Thompson, H. Hutton, W. Jones, J. Barclay, J. Liverseege, and C. F. Jarvis.

Western Chemists' Association of London.—Messrs. Martindale, J. H. Mathews and R. H. Parker.

Bournemouth Chemists' Association.—Messrs. Bridge (President), Hardwick, Trove, Spinney, and Bitson.

Cambridge Chemists' Association.—Mr. R. S. Campkin. Letters of apology for their absence had been received from Messrs. F. B. Bengier, E. C. Stanford, Peter Boa, Ebert (Chicago) N. M. Grose, E. F. Harrison, Walter Hills, J. C. C. Payne, L. Siebold, and Peter McEwan.

REPORT OF THE EXECUTIVE COMMITTEE.

Mr. NAYLOR (Hon. Sec.) then read the following report of the Executive Committee:—

Report of the Executive Committee.

In presenting the thirty-first annual report your Committee is glad to be able to state that general interest in the work of the Conference shows no sign of diminution. Increased membership is still, how-

ever, a desideratum, for although the last two annual meetings have been exceptionally well attended, the number of enrolled members represents no marked increase.

With the view of bringing the Blue List up to date, it has been completely revised by a sub-committee appointed by your Executive. Several new subjects have been introduced, the majority of which are specially adapted for investigation by pharmacists, while others which have been exhausted, or do not appear of sufficient importance, have been expunged. The form of the circular has also been subjected to some modification. Only one application for a money grant in aid of research has been received during the year, the sum of £3 having been granted to Mr. H. Bowden in furtherance of his investigation of *Hemidesmus indicus*, a report of which is to be presented to the present meeting. Mr. R. A. Cripps has been unable during the year to continue his work on ipecacuanha, for which grants have been previously made to him, but he hopes shortly to resume his examination of this drug. Mr. W. Elborne, B.A., who was last year the recipient of a grant, is also unable at the present time to supply a further instalment of his work on coto bark.

The Conference has lost by death several valued members during the past year. Of these, Professor Bentley was probably the most widely known. He was one of the founders of the Conference, and filled the office of President for two consecutive years—at Nottingham in 1866, and at Dundee in 1867. His long association with pharmacy as a professor, and his devoted enthusiasm to botany, brought him into contact with distinguished men from all parts of the world. His treatises relating to botany and materia medica have long been and still are justly valued. In the last annual report reference was made to the resignation of Mr. R. H. Davies, as Honorary Treasurer of the Conference, owing to prolonged illness. In recognition of his services he was last year elected a Vice-President. To the deep regret of his numerous friends the illness terminated fatally, and in December last your Committee had the melancholy duty of directing that a letter of condolence be sent to Mrs. Davies in her bereavement. Mr. Davies was a frequent contributor to these meetings, and his papers on various chemical subjects bespeak a mind that was imbued with the fine spirit of science.

Professor J. M. Maisch, of Philadelphia, an honorary member of the Conference, and the author of valuable pharmaceutical works, also died last autumn, shortly after receiving the Hanbury medal. For twenty-six years he acted as permanent Secretary to the American Pharmaceutical Association. Lastly, we have to record the loss of Mr. W. D. Savage, of Brighton, a veteran pharmacist and former Vice-President of the Conference, whose death took place only a few weeks ago. Through the decease of Mr. R. H. Davies a vacancy occurred in the Vice-Presidency, to fill which your Committee elected Mr. J. H. Mathews, of London. Two honorary members have also been elected during the year, Professor Joseph P. Remington, of the Philadelphia College of Pharmacy, and Dr. Anton von Waldheim, President of the Gremium of Pharmacists of Vienna.

Mr. Louis Siebold, F.I.C., F.C.S., was re-appointed editor of the Year-Book, and the MS. of parts I.-IV. inclusive is now in the hands of the printers. It is believed that the earlier publication of the volume, to which reference was made last year, has been appreciated by members generally.

The reception of the President was held in the Christ Church Hall last night. This and the conversations which followed were largely attended, and much appreciated by members of the Conference and their friends.

FINANCIAL STATEMENT FOR THE YEAR ENDING JUNE 30, 1894.

THE HON. TREASURER IN ACCOUNT WITH THE BRITISH PHARMACEUTICAL CONFERENCE.

July 1, 1893.	Dr.	£ s. d.	£ s. d.	June 30, 1894.	Cr.	£ s. d.	£ s. d.
To Assets forward from last year—				By Expenses connected with Year-Book:—			
Balance in hand at Bank			84 10 7	Printing, Binding, Publishing, etc.		262 9 8	
Cash in Secretary's hands			1 2 8	Postages and Distributing		24 12 11	
Messrs. Churchill's Account			85 16 5	Advertising and Publishers' charges		21 8 7	
June 30, 1894.				Editor's Salary		150 0 0	
To Sale of Year-Book by Publishers			20 0 0	Foreign Journals for Editor		5 17 6	
„ Advertisements, 1893 volume		80 8 3					465 8 8
„ „ 1892 „		1 14 0		„ Unofficial Formulary:—			
			82 2 3	Advertising		0 5 0	
„ Members' Subscriptions, Amount received from July 1, 1893, to June 30, 1894			485 8 10	Publishers' Commission		0 7 8	
„ Index Book, Sales by Publishers		0 0 0					0 12 3
„ „ Secretary		0 7 6		„ Sundry Expenses:—			
			0 7 6	Assistant Secretary at Nottingham		10 0 0	
„ Liabilities on Outstanding Account, Messrs. McCorquodale and Co.		8 15 6		Copies of President's Address		0 15 0	
Messrs. Butler and Tanner		1 18 7					10 15 0
			5 14 1	„ Assist. Sec.'s Salary from July 1, 1893, to June 30, 1894		45 0 0	
„ Unofficial Formulary, Sales by Publishers			8 12 0	„ Rent of Office		10 0 0	
„ Unused Cheques			0 7 2				55 0 0
„ Sundries			0 15 0	„ Blue List, Printing		8 15 6	
				Postages		2 11 8	
							6 7 2
				„ Postages			11 14 7
				„ Printing and Stationery			17 9 0
				„ Bank Charges, as per Bank Book			1 4 4
				„ Petty Cash Expended			5 19 5
				„ Liabilities of last year, since paid			8 4 6
				„ Outstanding Assets—Messrs. Churchill's Account			82 18 5
				„ Sundries			0 0 5
				„ Balance at Bank		0 10 9	
				„ Balance in Secretary's hands, for Postage, 14s. 7d.; Petty Cash, 2s. 5d.		0 17 0	
							1 7 9
				„ Grants for Research			8 0 0
							£669 16 6
			£669 16 6				

THE BELL AND HILLS FUND.

1893.	To	£ s. d.	£ s. d.
July 1.	To Balance in hand	14 13 9	
	„ One Year's Dividend on Consols	9 14 5	
			24 8 2
	By Purchase of Books for Nottingham		9 7 11
			16 0 8
Assets—			
Cash—Balance at Bank		15 0 8	
Consols		800 0 0	
	Examined and found correct { J. WILFORD, } Auditors.		
			C. CLAYTON,

The TREASURER (Mr. John Moss) being called upon to read the financial statement, said he must first say a word in reference to his predecessor, the late Mr. R. H. Davies. He thoroughly agreed with everything which had been said by the President, and in the report of the Executive. Knowing Mr. Davies personally for a great many years, he knew how true those words were. He was a most painstaking man, a man of great accuracy and minuteness, and in every way a man of science; one who knew thoroughly every subject on which he professed to speak. With regard to the financial statement, it showed to some extent the depression which had been such a marked feature lately in all parts of the world, but not so much as might have been feared. For a voluntary body representing the professional, scientific, and social side of pharmacy to pursue its course so evenly was evidence of a strong desire on the part of pharmacists as a body for something which merely commercial questions could not satisfy. Still, the number of members was not satisfactory, and many thought that if they had better means of making known the advantages which the Conference could confer on individual pharmacists, the number would represent not 10 per cent. but more like 50 per cent. of the pharmacists in the United Kingdom. If ever that could be accomplished they would be able to do a great deal more good, and many publications which now had to be charged for might be given to the members free. The great thing

to aim at was for each member to act as an apostle, and bring in new disciples.

The PRESIDENT having certified that the accounts had been duly audited, moved the adoption of the report and financial statement.

Mr. UMNEX seconded the motion, which was carried unanimously.

THE UNOFFICIAL FORMULARY COMMITTEE.

Mr. MARTINDALE next read the report of the Unofficial Formulary Committee, as follows:—

To the British Pharmaceutical Conference in session.

Since our last meeting the Committee have, with the sanction of the Executive, produced a new issue of the 'Unofficial Formulary,' which is now ready for sale. They have added four new formulæ, viz.:—*Collodium Stypticum*, *Extractum Belladonna Folii Alcoholicum*, *Liquor Bromo-Chloral Compositus*, and *Syrupus Acidi Hydriodici*. Several alterations and corrections have been made, which further experience of the preparations had rendered necessary. These consist principally in lessening the acidity of some of the syrups, thereby rendering them more stable and palatable, and in an improved formula for *Collodium Belladonna*. The latter presented difficulties in the way of preparing it from a liquid extract sufficiently

concentrated to be stable. They have overcome these by using a solid alcoholic extract of belladonna leaf, which must be assayed at the time of preparing the collodion, so as to obtain an uniform product.

WM. MARTINDALE,
Chairman of the Formulary Committee.
(To be continued.)

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

ACCIDENTAL POISONING BY LINIMENT.

An inquest was held on July 25 by Mr. S. Smelt, deputy city coroner, on the body of Hannah Mather, aged 73 years, who lately lived in Queen's Road, Manchester. The deceased had suffered from bronchitis, and on Monday night drank by mistake for medicine a spoonful of a liniment which she was using for outward application. Death resulted on Tuesday. A verdict of accidental death was returned. The coroner remarked that there ought to be legislation compelling dispensers of medicine to use a distinctive shape of bottle for poisons. In Germany a bottle was used for poisons of a shape that could not be mistaken, and in some hospitals in this country fluted bottles coloured blue were used, so that people could tell them in the dark. If there had been a law compelling the use of distinctive bottles for poisons this accident would not have happened.—*Manchester Guardian*.

POISONING BY CARBOLIC ACID.

Mr. T. J. Sworder, coroner, held an inquest at The Oak, Stanstead Abbots, on Tuesday, July 17, upon the body of George Frederick Winteron, aged 3 years and 3 months, the son of a tailor of that place, who died on Saturday last through drinking a dose of carbollic acid by mistake.—*Hertford Chronicle*.

POISONING BY CHLOROFORM.

Mr. A. Braxton Hicks held an inquiry, on July 24, into the death of Septimus Collins Burton, aged 35 years, a chemist's assistant, late in the employ of Mr. Farmer, a chemist, of 106, High Street, Putney, who was found dead in bed on the morning of July 21. It was proved that the deceased, who was married, and has left three children, suffered from sleeplessness and neuralgia. To obtain sleep he was in the habit of taking large quantities of chloroform, sometimes as much as half a pound a day. Medical evidence showed that death was due to chloroform, but how the poison was obtained was unexplained. It was suggested that it had been purchased from a wholesale house. The jury returned a verdict of "Death from misadventure," and added a rider that the attention of the Privy Council should be drawn to the large quantities of chloroform sold by wholesale or retail chemists. The coroner remarked that two pound bottles of chloroform had been found in the deceased's room. He would have the matter fully inquired into.—*Morning*.

POISONING BY POTASSIUM CYANIDE.

On Saturday, July 14, Mr. W. Wynn Evans, the East Denbighshire coroner, held an inquest at the Fairfield Tavern, Wrexham, on the body of a tailor, named John Henry Williams, aged 37.—The deceased's landlady said he came home on Friday morning, and said he had to go to work in the afternoon. He had been drinking since the previous Saturday, and had brought something home to steady his nerves. He went to bed, and when she went to

call him at dinner time she found he was dead.—Dr. Parry Jones said the symptoms were consistent with poisoning by cyanide of potassium.—Mr. C. G. Caldecott, manager to Mr. J. F. Edisbury, chemist, High Street, Wrexham, said the deceased came into the shop, and said he wanted some cyanide of potassium to clean some gold lace. As witness knew deceased, and also knew that tailors used the poison in their business, he supplied him with half an ounce.—Wm. Wynn, a fellow workman of the deceased, said deceased told him some time ago that cyanide of potassium, in very small doses, was a grand thing to take after anyone had been on the spree.—The coroner said there was a doubt as to whether it was the intention of the deceased to take his life, and he thought that taking the evidence into consideration, the jury would be justified in bringing in a verdict of "Death from misadventure."—This was accordingly done.—*Onwestry Advertiser*.

POISONING BY ATROPINE.

On July 16, an inquest on the body of Mr. Pelham Parker, who died under peculiar circumstances, was held at the Prince of Wales Hotel, Montague Street, Blackburn.—Dr. Gray said he was deceased's medical attendant. He was called to Mr. Parker at 1.45 p.m. the previous day, when he found him suffering from atropine poisoning, and unconscious. Atropine was the active principle of belladonna. A small bottle (produced), labelled "Atropine Eye Drops—Poison," was given to witness as the one taken from deceased. Witness had sent similar bottles containing laudanum to deceased for his son's earache.—Margaret Parker, the widow, said that her husband was in the habit of having warm baths on Sunday mornings. He had one on the previous day, and then returned to bed. About eleven o'clock she entered his bedroom and saw him standing with a small bottle in his hand. He said it was laudanum, and he was taking it to make him sleep. Witness took it from him, and two hours afterwards the deceased became very ill. She gave him an emetic of mustard and water, which he took willingly, and after he had been sick she thought all the danger was over. He came downstairs and read the paper, and appeared to be all right up to about two o'clock, when he became unconscious, in which state he remained until 2.30 on Monday morning, when he died.—The jury retired to consider their verdict, and upon their return Mr. Whittle, the foreman, said that they had come to the conclusion that Mr. Pelham Parker had met his "Death by misadventure."—*Lancashire Evening Express*.

Books, etc., received.

ONTARIO COLLEGE OF PHARMACY. Syllabus for 1894-95. Pp. 64. From the College.

THE INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND. Register for 1894-95. Pp. 103. From the Secretary.

INVESTIGATION OF THE COMPOSITION OF THE AIR IN THE SEWERS OF SYDNEY, WITH SPECIAL REFERENCE TO THE PRESENCE OF GERMS. By J. MCGARVIE SMITH. Pp. 11. From the Author.

CHOLERA—NOTIFICATION OF DIARRHŒA. From the Local Government Board.

REPORTS ON THE WORK OF THE LEATHER AND TEXTILE INDUSTRIES, DYEING, AND ART CLASSES OF THE YORKSHIRE COLLEGE, LEEDS. For the Session 1894. From the College.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Hall, Hill, Johnson, Parker, Proctor.

THE CHEMISTRY OF IPECACUANHA.

BY DR. R. H. PAUL AND A. J. COWNLEY.

In a previous paper on this subject* we showed that, contrary to the generally received opinion, the substance hitherto known as emetine is a mixture of two or more alkaloids, and that in order to determine the value of different kinds of ipecacuanha from the amount of alkaloid contained in them, further knowledge of these substances was requisite. Our inquiry is now sufficiently advanced to admit of the results being published. But before entering upon a further statement of the results we have obtained in our investigation of ipecacuanha, it is desirable to summarise the accounts given by previous inquirers, because of the manifold discrepancies they present in regard to the character of the substances obtained, and also because of the uncertainty prevailing as to the nature of the drug operated upon.

The investigation of ipecacuanha from a chemical point of view was first undertaken by Pelletier shortly after Sertürner's discovery of morphine. He showed† that the medicinal properties of the drug were due to a "proximate principle" or "matière vomitive," to which he gave the name of emetine, from *emetere*—to vomit, and a formula for its preparation was introduced into the French Codex in 1818.‡ The product so obtained—amounting to about 16 per cent. of the drug—was little more than a concentrated alcoholic extract. It had the form of transparent scales of reddish-brown colour, acid reaction and bitter taste, very deliquescent, soluble in all proportions in water or alcohol, but insoluble in ether. The aqueous solution gave a green colour with ferric salts and copious flocculent precipitates on addition of basic lead acetate or infusion of nut galls. It was, in fact, a pharmaceutical preparation rather than a distinct chemical substance, and was essentially a saline compound of the basic constituents of ipecacuanha, with an acid somewhat analogous to lactic acid.

Subsequently, Pelletier succeeded, in conjunction with Magendie, in obtaining a purer product of distinctly basic character, which was submitted to analysis by Dumas,§ and found to have an elementary composition, which was represented as corresponding with the formula $C_{15}H_{24}NO_4$.

This base was described as a white pulverulent substance, sometimes slightly yellowish, and becoming coloured on exposure, but not deliquescent; melting about 50° C., very slightly soluble in cold water, freely soluble in alcohol, and insoluble in ether. It had a marked alkaline reaction and neutralised acids, but did not form crystallisable salts, though acid solutions sometimes showed signs of crystals. An aqueous solution did not give a precipitate on the addition of basic lead acetate. It was, therefore, very different from the emetine of the French Codex, and Magendie found it to be three times as effective medicinally.

* *Pharmaceutical Journal*, liii., 61.

† 1817. 'Recherches chimiques et physiologiques sur l'ipecacuanha'; *Annales de Chimie et de Physique*, iv., 3; and *Journ. de Pharm.*, [2], iii., 145; iv., 323.

‡ *Codex Med.*, 1818, p. 179.

§ 'Recherches sur la composition élémentaire et sur les propriétés caractéristiques des bases salifiables'; *Ann. de Chim. Phys.*, [2], xxiv., 180.

The following are the analytical data given by Dumas:—

	Found.	Calculated.
Carbon	64.57	64.24
Hydrogen...	7.77	8.89
Nitrogen...	4.30	4.96
Oxygen.....	22.95	22.61
	99.59	100.20

Various methods of preparing emetine were subsequently suggested by Calloud, Merck, Reich, and Lepat; but probably none of them furnished a perfectly pure and chemically individual substance.

The examination of the alkaloid obtained from the official Brazilian ipecacuanha by Reich* is chiefly noticeable for the results of the elementary analysis leading to the formula $C_{30}H_{30}N_2O_8$.

	Found.	Calculated
Carbon.....	63.114	63.49
Hydrogen	7.991	7.93
Nitrogen	6.109	7.40
Oxygen.....	22.786	21.18
	100.	100.

The ipecacuanha then employed for medicinal purposes in France was probably the officially recognised drug imported from Brazil under the name of Rio ipecacuanha, the produce of a plant belonging to the genus *Cephaelis*, and growing in the province of Mato Grosso, situated in the basin of the River Paraguay.† The Codex of 1758 enumerated three kinds of the official drug‡—ipecacuanha fusca, ipecacuanha cineritia, and ipecacuanha candidior,—which would probably correspond with the three varieties—brown, grey, and white—mentioned by Pelletier in his memoir as being the kinds most used.§ The botanical source of these varieties is uncertain, for Pelletier's statement that the brown ipecacuanha examined by him was the produce of *Psychotria emetica* was subsequently corrected by Guibourt.|| Besides the varieties attributed to the genus *Cephaelis*, two other kinds of ipecacuanha appear to have been official at that time, the "striated"¶ and "undulated."*** Other kinds of ipecacuanha were imported from Pará and Bahia under names taken from the provinces of Brazil, where they were collected. Some of them were possibly derived from plants of the genus *Cephaelis*, and others from species of *Lonidium*, etc.

The gradually increasing scarcity and high price of the Brazilian drug, as well as the success attending the importation of cinchona bark from New Granada, subsequently led to the introduction of a drug from that part of South America under the name of Carthagena ipecacuanha, obtained from a plant growing in great abundance on the banks of the Magdalena river, and considered by Guibourt†† to be a different and botanically undetermined species of *Cephaelis*. In 1869

* 1863. 'Archiv. der Pharmacie,' [2], 113, 193.

† See Weddell, 'Ann. des Sciences naturelles,' ii., 193.

‡ *Codex Med.* 1758, p. 63.

§ *Journ. de Pharm.*, iii., 148.

|| Guibourt, *Histoire abrégée des Drogues simples*, 2nd Ed. I., 298.

¶ Described by Guibourt as "Radix Psychotrie," *Ibid.*, p. 301.

*** Referred by Guibourt to a species of *Richardsonia*, *Ibid.*, p. 302.

†† 'Histoire naturelle des drogues simples,' iii., 82, 1850.

Lefort directed attention to this drug,* pointing out that, although differing in appearance from Brazilian ipecacuanha, it might be equally useful medicinally, and could, in that case, be recognised officially as a valuable supplement to the Brazilian drug. But before its use in pharmacy could be adopted, better knowledge of its components and of its actual relation to the official drug as a therapeutic agent was requisite.

In order to solve that problem, and, with the view of definitely settling the question whether the ipecacuanha of New Granada could be substituted for the official drug, Lefort made a comparative examination of the two kinds, by determining the amount of alkaloid contained in them respectively.†

Following in the track of the observations made by Pelletier and Dumas, that the alkaloid of ipecacuanha formed with tannin a compound characterised by its very sparing solubility in water, Lefort had recourse to that method for ascertaining the amount of alkaloid in the ipecacuanha of New Granada as compared with that of Brazil. The dry powdered drug was exhausted with strong and weak alcohol successively, the alcoholic liquor evaporated to a syrupy consistence, and the residue mixed with from five to twenty volumes of water. To the filtered liquor a concentrated solution of tannin was added in slight excess, and the precipitate thus formed was well washed, dried, and weighed.

Operating in this way the conclusion was arrived at that the ipecacuanha of New Granada contained rather less alkaloid than that of Brazil, the relative amounts of tannate obtained being 1·341 and 1·449 per cent.

Another method adopted for comparing the two kinds of ipecacuanha as to their contents of alkaloid was based upon the sparing solubility of the nitrate in water. The results so obtained were much the same as in the previous case so far as the amount of alkaloid was concerned; but the identity of the basic constituents in the two different kinds of ipecacuanha appears to have been too readily assumed by Lefort.

In a subsequent memoir, published during the same year, Lefort gave the results of a more particular study of the properties and composition of the alkaloid obtained from ipecacuanha.‡ The method adopted for its extraction consisted in treating the syrupy residue of an alcoholic extract with caustic potash and chloroform. After evaporating the chloroform solution, a product was obtained consisting chiefly of the base mixed with a resinous substance. These were separated by treatment with a very dilute acid, and by adding just enough ammonia to the clear solution, the base was precipitated almost free from the resinous substance, the last portions of which were removed by digesting the precipitate with ether, after washing with water and drying.

The base thus obtained was a very light powder,

of a white or grey colour, according to the degree of purity, almost inodorous and of bitter taste. It melted at 70° C., and on exposure acquired a brownish colour, but did not deliquesce. It was very sparingly soluble in cold water (1 in 1000), readily soluble in alcohol and chloroform, but very slightly soluble in ether, and it was uncrystallisable. The base was readily dissolved by caustic potash or soda, and the solutions rapidly absorbed oxygen from the atmosphere. It was less freely soluble in ammonia, and when mixed with lime or magnesia, it became yellow on exposure. It was readily dissolved by most acids, neutralising them and forming soluble uncrystallisable salts; with nitric acid it formed a very slightly soluble salt, which was considered to be the most distinctive characteristic of the base. Potassium iodide and alcoholic solution of iodine gave precipitates very sparingly soluble in water. Mercuric chloride and potassium hydrargyroidide gave white precipitates, insoluble in water and soluble in alcohol. The platinochloride was soluble in water, but only sparingly soluble in alcohol. Ammonium molybdate gave a precipitate as well as basic lead acetate.

The base obtained by Lefort was not analysed, but with the aid of the analytical data obtained by Pelletier and Dumas he endeavoured to ascertain its molecular weight from the saturating capacity, and the composition of its salts, by determining the amounts of sulphuric acid and chlorine in the neutral sulphate and hydrochloride. On that basis, and assuming the alkaloid to be identical with the substance analysed by Dumas, it was inferred that its formula was $C_{20}H_{41}N_3O_8$.

	Calculated.	Dumas.
Carbon	64·28	64·57
Hydrogen	7·86	7·77
Nitrogen	5·00	4·30
Oxygen	22·85	22·95
	99·99	99·59

The subject was next taken up by Professor Glénard,* who applied the method of treatment with lime and ether for the extraction of the basic constituent of ipecacuanha, obtaining it in that way colourless and in relatively large quantity, a result that was not consistent with the description of emetine then accepted.

A dry alcoholic extract of the drug was warmed with an equal quantity of water, mixed with one and a half times its weight of lime, and the pulverulent mixture percolated with hot ether, in the proportion of one litre to 100 grammes of extract. By that treatment it was assumed that the whole of the alkaloid might be extracted. The ether solution was then shaken with sufficient water and hydrochloric acid to form a salt, and after separating the ether, the base—precipitated from the aqueous solution by ammonia, washed, and dried—presented all the characters attributed to emetine. By careful evaporation of the aqueous solution of hydrochloride, the salt was obtained in a crystalline condition. This result, contrary to the previous experience of Lefort and others that all the salts of emetine were uncrystallisable, enabled Glénard, by repeated recrystallisation, to prepare

* Carthagena ipecacuanha was imported into France in boxes or casks by way of Havre, while the Brazilian drug was imported in serons by way of Bordeaux.

† Examen comparatif des ipecacuans du Brésil et de la Nouvelle Grenade ou Carthagène. *Journ. de Pharm. et de Chimie*, [4], ix., 167, March, 1869.

‡ Recherches sur la préparation, les propriétés et la composition de l'émétine. *Journ. de Pharm. et de Chimie*, [4], ix., 241, April, 1869.

* 1876. 'Recherches sur l'alkaloïde de l'ipecacuanha.' *Annales de Chimie et de Physique*, [5], viii., 233.

product of greater purity than had hitherto been obtained.

The analysis of this base gave results very different from those obtained by Dumas, as shown below:—

	Glénard.		Dumas.
Carbon.....	72.43	72.08	64.57
Hydrogen	8.64	8.59	4.30
Nitrogen	5.28	5.42	7.77
Oxygen	13.65	13.91	22.95

These data, leading to the formula $C_{15}H_{22}NO_3$, were further confirmed by analysis of the crystalline hydrochloride:—

	Found.	Calculated for $C_{15}H_{22}NO_3 + HCl$.
Carbon	63.00	63.26
Hydrogen	8.15	8.08
Nitrogen	4.75	4.92
Oxygen	11.64	11.24
Chlorine	12.46	12.47

By these results Glénard was led to the conclusion that the substance analysed by Dumas, as well as that subsequently obtained by Lefort, could not have been sufficiently purified.

As a consequence of the question raised by Glénard as to the purity and individuality of the substance obtained by previous experimenters, a further paper was published by Lefort and Wurtz,* in which they suggested an improved method of preparing emetine by mixing an aqueous solution of the alcoholic extract of ipecacuanha with a saturated solution of potassium nitrate. The washed precipitate of nitrate, requiring 100 parts of water for solution, was dissolved in hot alcohol, mixed with lime and, after evaporating off the alcohol, the dry residue was extracted with ether. The base was then submitted to further purification until almost colourless, and was assumed to be absolutely pure. Analysis gave results corresponding with the formula $C_{25}H_{40}N_2O_6$.

	I.	II.	III.	Calculated.
Carbon ...	69.79	69.47	69.01	69.42
Hydrogen 8.15		8.18	8.14	8.27
Nitrogen... 5.15		5.84	5.49	5.78
Oxygen ...16.30		16.51	17.36	16.53—100

As further confirmation of the formula based on these results, an analysis of the nitrate showed that its composition would be represented by the formula $C_{25}H_{40}N_2O_6 + 2NO_3H$.

Whatever may have been the chemical character of the substances subjected to analysis for the purposes of the investigations already referred to, there can be little doubt that the substances met with in trade under the name of emetine were impure and sometimes contaminated with a considerable amount of resin or of the constituent of ipecacuanha which resembles tannin. That circumstance was pointed out by Podwysotski,† who proposed the use of ferric chloride to get rid of this impurity. The product he obtained was snow white, it melted at 62° to 65° C., had a strong alkaline reaction, was readily soluble in ether, and very sparingly soluble in water. By the slow evaporation of an ether solution of the base partial crystallisation took place, but none of the salts were obtained in a crystalline state. The base was sparingly soluble in

cold petroleum spirit or benzene, but easily soluble when heated, separating again on cooling in white flocks.

Some years afterwards the alkaloid of ipecacuanha was again submitted to investigation by Kunz,* who adopted a modified form of the method suggested by Podwysotski for its preparation. The product he obtained was amorphous and perfectly colourless, but rapidly became yellow on exposure. It was by no means insoluble in caustic alkalies, very sparingly soluble in cold water, cold petroleum spirit, or ether, but more freely by heating. By the rapid evaporation of a concentrated ether solution, distinct acicular crystals were sometimes obtained. When perfectly free from moisture or adherent petroleum ether, the melting point was from 68° to 74° C. The retention of minute traces of solvent was also considered to have been the cause of the differences between the analytical results of previous observers, and when that was provided against, analysis gave results leading to the formula $C_{30}H_{40}N_2O_6$.

In none of the memoirs above referred to is there any statement as to the kind of ipecacuanha operated upon, and it was probable that some of the discrepancies they present might be ascribed to differences in the drug examined. The general probability that ipecacuanha might contain more than one alkaloid was recognised by Glénard as well as by Lefort and Wurtz, but in neither case was any definite conclusion arrived at on this point, and the alkaloid obtainable from ipecacuanha has hitherto always been regarded as a substance having distinct chemical individuality.

We have already shown that this is not the case, and further inquiry has shown that in the ipecacuanha of Brazil, as well as that of New Granada, there are at least two distinct bases presenting well-marked differences in their physical characters and salts.

One of them is soluble in caustic alkali, and can be obtained in a crystalline state from an ether solution. The other is insoluble in caustic alkali, and it appears to be uncrystallisable. There is a further distinction between the salts of these two bases: those of the first-mentioned being uncrystallisable, while the halogen salts and the nitrate of the other base can be crystallised.

For reasons stated below we propose to retain the name of emetine for the base insoluble in caustic alkali, and to apply to the other base, which has now been isolated, the name of cephaeline.

Both these bases are present in Brazilian ipecacuanha and also in Cartagena ipecacuanha. In the latter drug cephaeline appears generally to preponderate over emetine, and probably that is also the case in the stalky portion of the Brazilian drug. But if emetine be the active constituent of ipecacuanha, it would seem probable that the New Granada drug has a medicinal value little, if at all, inferior to that of the Brazilian drug now met with in commerce.

In the examination of Brazilian ipecacuanha the following method was adopted.†

A quantity of the drug was extracted with

* 1877. 'Mémoire sur la préparation et la composition de l'émétine.' *Ann. Chim. Phys.*, [5], viii., 277.

† 1880. 'Pharmaceutisches Zeitschrift für Russland,' ix., 1. See also *Pharm. Journ.*, [3], x., 642.

* 1887. 'Beiträge zur Kenntniss des Emetine.' *Archiv. der Pharmacie*, xxv., 461.

† The sample operated upon contained a considerable proportion of stem.

alcohol, the liquor mixed with basic lead acetate until no further precipitate was formed, the filtered liquor evaporated to dryness, and the residue dissolved with weak acid. The clear solution was mixed with ether, ammonia added in slight excess, and shaken. The ether solution of alkaloid was then shaken out with weak sulphuric acid, and the base precipitated from the aqueous solution by soda in excess. The precipitate after washing and drying amounted to 1.34 per cent. It still retained some base soluble in caustic soda, for the separation of which repeated treatment was necessary.

The product thus obtained was therefore dissolved in acid and shaken with caustic soda in presence of ether, this operation being repeated until the base soluble in caustic alkali had been completely separated. The insoluble base was then converted into hydrochloride, the salt re-crystallised from water,* and the base finally precipitated by ammonia.

The alkaline solution acidulated and then shaken with ether and ammonia gave the base soluble in caustic alkali, amounting to 0.6 per cent.

In the examination of New Granada ipecacuanha the powdered drug was mixed with lime and extracted with amyl alcohol, the subsequent separation of the bases being effected as in the previous instance.

EMETINE.—This base is apparently amorphous, and almost colourless; it melts about 68° C., is strongly alkaline to litmus, and neutralises acids completely. On exposure to light it acquires a yellowish colour. It is readily soluble in alcohol, ether, chloroform, or benzene; but only sparingly soluble in hot petroleum spirit or in water.

On evaporating any of these solutions the base is left in the form of a transparent varnish.

The sulphate, acetate, and oxalate are very soluble in water or alcohol, and apparently uncrystallisable; the hydrochloride, however, may be obtained in a crystalline condition by evaporating a water solution slowly, or by adding ether to an alcoholic solution. It crystallises from a water solution in radiating groups of silky filaments.

A five per cent. solution of the hydrochloride mixed with potassium bromide or iodide gives dense precipitates, which dissolve on addition of alcohol, and by slow evaporation both the hydrobromide and hydriodide of the base crystallise in tufts of silky needles.

The nitrate is very sparingly soluble in water, and separates as a resinous mass on adding potassium nitrate to a five per cent. solution of the hydrochloride. It is more freely soluble in alcohol, and by gradually adding ether to the solution is deposited in crystalline tufts.

The platinochloride is a pale buff coloured amorphous precipitate, almost insoluble in water or alcohol.

Analysis of the base gave the following results, corresponding very closely with those obtained by Glénard, and with the formula $C_{15}H_{22}NO_2 = 248$:—

* In order to obtain a crystallisable salt the base must be in a pure state. The presence of any considerable amount of the base soluble in caustic alkali prevents crystallisation.

	I.	II.	Mean.	Calculated.
Carbon	72.23	71.80	72.01	72.58
Hydrogen	8.71	9.02	8.86	8.87
Nitrogen	—	5.75	5.75	5.64
Oxygen	—	—	13.38	12.91
			100.00	100.00

By titrating the base it was found to require for complete neutralisation 14.56 per cent. HCl.

Base. HCl
0.23 required 4.3 C.c. $\times 0.078 = 0.335 = 14.56$ per cent.

This corresponds to 12.71 per cent. HCl in the salt, the calculated quantity being 12.83 per cent.

The hydrochloride dried until constant at 100° C. did not show any further loss at 120° C.

0.163 gave 0.2828 = 0.2105 = 12.91 per cent.
Calculated for $C_{15}H_{22}NO_2 \cdot HCl = 12.83$.

The platinochloride dried until constant at 100° C. was partially decomposed at 120° C.

Pt.
0.208 gave 0.45 = 21.63 per cent.
Calculated for $(C_{15}H_{22}NO_2)_2PtCl_2 \cdot 2HCl = 21.52$ Pt.
Molecular weight 906

CEPHELINE.—This base, when precipitated from a solution of one of its salts by ammonia, is colourless, but, like emetine, it acquires a yellow colour on exposure to light: it is very much less soluble in ether than emetine, and is very sparingly soluble in cold petroleum spirit, but with the aid of heat it is more freely dissolved, and, on cooling the solution, is again deposited in a flocculent form. By evaporating a solution in alcohol, ether, or petroleum spirit, the base is left in the form of a faintly yellowish transparent varnish; but in a closed vessel a concentrated ether solution deposits after some time bunches of delicate silky crystals, which appear to be formed more readily in the presence of water. The ammonia precipitate melts at about 102° C. The crystals from ether melt in a capillary tube at 96° to 98° C. By exposure on a watch glass to a temperature of 100° there is a loss of weight amounting to 4.78 per cent.; at 120° C. there is no further loss, but the substance then acquires a brown colour without melting, and apparently undergoes some alteration which has not yet been studied.

The salts of cephaeline are apparently uncrystallisable, but otherwise much resemble the corresponding salts of emetine. The platinochloride is yellow and decidedly darker in colour than the corresponding salt of emetine.

Analysis of the anhydrous base gave the following results corresponding with the formula $C_{14}H_{20}NO_2 = 234$:—

	Found.	Calculated.
Carbon	71.28	71.79
Hydrogen	8.69	8.54
Nitrogen	6.24	5.94
Oxygen	13.79	13.73
	100.0	100.0

By titrating the base, it was found in two experiments to require for neutralisation 15.66 and 15.67 per cent. HCl, the calculated quantity for the formula given above being 15.598 per cent. The mean of these results would give 15.64 for the percentage amount of HCl in the salt, as against 13.49 calculated.

The platinochloride gave 22.38 per cent. platinum, the calculated quantity being 22.21 per cent. The physiological action of these two bases is

now being investigated, and for the present we are unable to do more than state that both emetine and cephaeline act as emetics in doses of about one sixth of a grain, causing at the same time a feeling of considerable depression.

It may be inferred from the foregoing description of the characters of these two bases and of their salts, that the only instance in which a base of definite chemical individuality has hitherto been obtained from ipecacuanha was the investigation of the drug by Glénard. The accounts given by other chemists of the products obtained by them are evidence that they either consisted mainly of cephaeline, or were indefinite mixtures of that base with emetine. Their statements that the base which they took to be emetine was soluble in caustic soda and in hot petroleum spirit, but only sparingly soluble in ether, show that it contained but little, if any, of the base isolated by Glénard. The methods of preparation adopted by Podwysotski and Kunz also suggest the probability that the product they obtained was chiefly cephaeline. As a consequence, the analytical data given by these chemists are of little value.

Glénard's results, however, are of a different nature. The methods of preparation and purification adopted by him, viz., extraction by means of lime and ether, and re-crystallisation of the hydrochloride, are precisely the conditions most favourable for eliminating cephaeline and ensuring the production of pure emetine. There was therefore every probability that, by this fortunate coincidence, a definite product would be obtained. Moreover, in regard to the characters and composition of emetine, Glénard's results are so completely in accord with those we have obtained, that there is no doubt as to the identity of the substance described by him under that name.

In conclusion it may be stated that, consistently with the facts above stated, examination of the substance met with in trade under the name of emetine, has shown that it is a mixture of the two alkaloids above described.

PATENT FOR A MEDICINAL PREPARATION.

"COMPLETE SPECIFICATION, No. 13,317, A.D. 1893.

"A New or Improved Lotion for the Cure of Ringworm.

"I, Thomas John Mott, Dairy Farm, Littleport, Cambridgeshire, farmer, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

"My invention relates to a new or improved lotion for the cure of ringworm, and has for its object to provide a lotion which will quickly and effectually cure that disease.

"In carrying my invention into practice I take of the following ingredients in or about the proportions stated below:—White copperas, 1 oz., Acetate of lead, 1 oz., Sal ammoniac, 1 oz., which are added to one pint of water, and when dissolved it is ready for use.

"The lotion is applied by means of a sponge about every six hours in ordinary cases, but could of course be applied more or less frequently, according to the acuteness of the disease.

"Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The new or improved lotion, consisting of white copperas, acetate of lead, sal ammoniac, and water, in or about the proportions herein stated, and for the purpose specified."

The Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, AUGUST 11, 1894.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.O.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMERIDGE, Secretary, 17, Bloomsbury Square, London, W.O.

Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STREET BROTHERS."

THE COUNCIL MEETING.

WINDING up the business of the past session, and providing for the holiday interval, which will intervene before the next meeting of the Council in October, constituted a large portion of the proceedings at the meeting last Wednesday.

Consequent upon the resolution passed last month in reference to the use of the metric system in the examination of candidates, the Boards of Examiners have considered the subject, and agree in the opinion that it is undesirable to adopt Mr. MARTINDALE's suggestion. Certain minor alterations of the Regulations were, however, recommended, and they were adopted by the Council.

The reports of the Finance and Benevolent Fund Committees did not offer any unusual features. Two grants were ordered to be paid, one of twenty pounds and the other of ten pounds.

The report of the General Purposes Committee included the reports on the Council Prizes Examination and the examinations for the PERRERA medal and scholarships, giving the names of the successful candidates, which will be found at page 121.

It is to be regretted that there has been really no competition for the Manchester Association Scholarship, and that the one candidate who presented himself for examination has failed to reach the standard required for the award of the scholarship. Those more especially interested in this endowment may, however, find some satisfaction in the fact that it has been made the means of assisting a scholar from the district to continue his studies in the Society's Research Laboratory, and to acquire a position on the teaching staff.

In a communication from Mr. Cox, of Plymouth, it was announced that the local chemists' association had passed a resolution approving of the Pharmacy Act Amendment Bill.

On the recommendation of the Committee proceedings were ordered to be taken against a number of persons for infringements of the Pharmacy Act.

LORD SALISBURY ON SCIENTIFIC IGNORANCE.

IN officiating as President of the British Association at the meeting in Oxford, the Marquis of SALISBURY has had to perform a task of more than ordinary difficulty. Being Chancellor of the University as well as President of the Association he had to tender as well as accept the welcome accorded by one body to the other. As President representing British science, and as Chancellor, those eager to learn from its high priests, the position was rendered still more embarrassing by the necessity of having, as a layman, to deliver an address to the most competent scientific audience in the world.

Lord SALISBURY was, however, fully equal to the emergency. His address did not present a review of the past year's scientific progress; but it was unprecedented for the novelty of its subject matter, for it surveyed the no less interesting and more important area of ignorance. Directing attention to that vast region of impenetrable mystery, in relation to which the knowledge we possess is but a small oasis in the desert, his Lordship selected for his theme three or four of the most important physical problems which it has been the effort of the last century to solve.

First among these scientific enigmas was the nature and origin of the chemical elements. Referring in the first instance to the almost irresistible conviction that the existence of these bodies is a strange anomaly concealing some much simpler state of facts, it was shown that hitherto all attempts to trace a common origin have failed as signally as the transmutation attempted by the alchemists of the Middle Ages. The subsequently renewed hope that the atomic doctrine of DALTON might lead to a solution has, when subjected to the tests of the laboratory, always received the clear and certain reply that facts do not offer the faintest foundation for the theory advanced on that basis. The discovery of spectrum analysis, by means of which such marvellous additions have been made to our knowledge, has added new difficulties and left us as ignorant as ever as to the nature of the capricious differences by which elementary atoms are distinguished, and as to the causes to which those differences are due.

The brilliant revelation of the periodic law by MENDELÉEFF, and its subsequent remarkable confirmation, dimly point to some identical origin of the co-ordinate families of elements. But that discovery has rather thickened than dissipated the mystery. The application of the comforting word "evolution" is inadmissible for alleviating our perplexity and masking the gap in our knowledge, since the elements do not breed, and consequently their ordered differences cannot be ascribed to accidental variations, perpetuated by heredity under the influence of natural selection. Greatly as DALTON'S, KIRCHHOFF'S and MENDELÉEFF'S successive

triumphs of research have added to our store of knowledge, they have done but little towards solving the problem which the elementary atoms present. The dream which lured the alchemists to their tedious labours has neither been realised nor refuted, and the boundary of our knowledge in this direction remains where it was centuries ago.

The next instance given of a riddle which has hitherto defied the scrutiny of science is the entity called the "ether." Since the time of YOUNG and FRESNEL the conception of this entity has received notable extension through the researches of MAXWELL and HERZ, showing that the undulations by which electricity travels through space probably take place in the same medium. But though the mystery of the ether has thus been made more fascinating, it remains as inscrutable as ever. Even its solitary function of undulating is performed in a fashion so abnormal as to cause infinite perplexity. Instead of transmitting impulses by waves travelling backwards and forwards in the path of their advance, the ether undulates athwart the path of the wave's advance. Lord KELVIN'S recent discovery of a condition under which a fluid may be conceived to undulate in this eccentric manner without outraging the laws of mathematics was merely mentioned by Lord SALISBURY as a subject on which he could not judge whether it is to be regarded as furnishing a permanent solution of the difficulty or merely what diplomatists call a *modus vivendi*. In any case it leaves our knowledge of the ether in a very rudimentary condition, while in regard to the counteracting and complementary forces of positive and negative electricity, the theory of electrical ether waves leaves our knowledge of their cause as slender as that possessed by FRANKLIN a century and a half ago.

But among the instances where obscurity hangs over problems which the highest scientific intellects have been investigating for generations there is none so striking as animal and vegetable life. The artificial production of compounds which are naturally found only in vital organisms has been considered to afford sufficient reason for demurring to the use of the term "vital force" to define the mysterious impulse which strikes across the ordinary laws of matter and twists them for a moment from their path. But Lord SALISBURY remarked that the counterfeit production of these compounds does not enable us to bring an organism into existence and cause it to run its natural course of change, and he pointed to the cause by which those results are effected, as the unknown force which continues to defy not only our imitation, but our scrutiny.

The concluding portion of the address was devoted to reviewing the deficiency of our knowledge in regard to the cause and origin of life.

the problem arose many millions of years ago. In treating of the Darwinian doctrine of the origin of species and the remarkable influence which it has exercised, the conflicting views of biologists and mathematicians, in regard to the difficulties arising from it, were criticised with a keenness approaching the satirical. This was especially the case in the reference to WEISMANN's argument, that the principle of natural selection must be accepted because "it is inconceivable that there should be another principle capable of explaining the adaptation of organisms without assuming the help of a principle of design." This use of the argument of design as a *reductio ad absurdum* Lord SALISBURY regards as an illustration of the revenge so surely brought by the whirligig of time. He objects to such an argument as that used by WEISMANN, as being out of place in science, although it may sometimes be admissible in politics, and holds that if facts will not provide a sound theory, confession of ignorance must be our only reasonable answer to the riddles which nature propounds.

THE BRITISH PHARMACOPOEIA.

WE are informed by the Secretary of the General Medical Council that, in connection with the subject of the Imperial extension of the Pharmacopoeia, and the proposal of the Medical Council to extend the usefulness of the work to the colonies and India, replies have been received by the Council, through the Colonial Office, from the Bahamas, Barbados, Bermuda, British Honduras, the Cape of Good Hope, Cyprus, Jamaica, Malta, Queensland, St. Helena, Sierra Leone, South Australia, Tasmania, Western Australia, and Zululand. Replies from other colonies are expected. A representative from Canada has visited London and has had interviews with members of the Council on the subject.

In all cases the proposal of the Council has been accepted. In some of the colonies neither climatic nor other conditions point to any special adaptations of the Pharmacopoeia, but offers are made to collect and forward any desirable information. In others medical and pharmaceutical committees have been appointed to consider and report on the matter. In some colonies the prevailing high temperature leads to requests for ointments of commensurate melting-point, for extracts having the minimum of moisture, and for pill masses less liable to become hard. The omission of costly drugs that are without special advantages and can easily be substituted is recommended in some of the communications. Several suggestions concerning individual preparations are made. Most of the valuable indigenous *materia medica* seem, as might perhaps be expected, to have already found their way into the British Pharmacopoeia.

THE CONJOINT EXAMINING BOARD.

THE Secretary of the Conjoint Examining Board in England of the Royal Colleges of Physicians and Surgeons states that the following new regulation will come into force on and after the 1st October next, namely:—"A candidate referred in chemistry and physics will be required before being admitted to re-examination to produce a certificate that he has received further instruction in those subjects to the satisfaction of his teachers, at an Institution recognised for the purpose by the Examining Board, for a period of not less than three months subsequently to the date of his reference."

INDIAN MEDICAL CONGRESS.

THE objects of this Congress, which will be held from December 24 to 29, 1894, are to bring together medical men from all parts of the Indian Empire to discuss Indian diseases, and to place on permanent record some of the work which is now lost to science for want of proper publication. The work of the Congress will be divided into the following sections:—1, Medicine and Pathology; 2, Surgery, including Ophthalmology; 3, Obstetrics, and Diseases of Women and Children; 4, Public Health; 5, Medico-Legal Medicine and Insanity; 6, Pharmacology, specially Indigenous Drugs. Although the Congress is primarily an Indian one, invitations have been sent to medical men in other countries, some of whom have already accepted, and it is believed that many more will come. A special committee has been formed to arrange for the accommodation of visitors and to provide for their comfort. The local secretaries of this committee are:—(1) Surgeon-Captain H. W. PILGRIM, General Hospital, Calcutta; (2) Dr. PRANDHAM BOSE, M.B., Calcutta Medical School, Calcutta, to whom, or to the honorary central secretaries, applications should be made for rooms. The price of accommodation in Calcutta may be taken from Rs. 7 to Rs. 14 a day for Europeans, and from Rs. 3 to Rs. 5 for Indians. Tickets of membership may be obtained from either the honorary central secretaries in Calcutta, or from the local secretaries, in the different parts of the Indian Empire. Members are requested to notify to the central secretaries, or to the local secretaries of their districts, their intention to read papers and the titles of the same, which should reach the central secretaries not later than October 15, 1894.

PROCEEDINGS UNDER THE PHARMACY ACTS.

THE *Manchester Evening News* remarks that the Pharmaceutical Society is "doing good service to the community by suing unqualified persons who sell poisons. One of the greatest dangers to society is the ease with which deadly drugs may be purchased, and a stricter enforcement of the Acts regulating their sale is highly desirable."

INTERNATIONAL EXHIBITION AT ANTWERP.

THE tenth international exhibition of hygienic and alimentary products will be held at Antwerp during September, under the auspices of the "Association internationale pour le progrès de l'Hygiène." The secretary of the executive committee is MONS. A. COPERMANS, pharmacien, Place de Meir, 85¹, Antwerp.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, August 8, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT,

MR. W. GOWEN CROSS, VICE-PRESIDENT,

Messrs. Atkins, Bottle, Gostling, Grose, Hampson, Harrison, Johnston, Martin, Martindale, Newsholme, Schacht, and Storrar.

The minutes of the last meeting were read and confirmed.

THE LATE MR. SAVAGE.

The PRESIDENT reported the receipt of a letter from Mr. W. W. Savage, Brighton, thanking the Council on his own and his mother's behalf for the letter of sympathy which he—the President—had been authorised to write.

MR. G. W. SARGENT.

The PRESIDENT read letters which had been received by himself and the Vice-President from Mr. Sargent. They had come to the conclusion that these letters were unsatisfactory, and recommended that Mr. Sargent's offer to resign his membership be accepted, and his name be removed from the roll of members. He would move a resolution to that effect.

The VICE-PRESIDENT seconded the motion, which was carried unanimously.

THE REGULATIONS OF THE BOARD OF EXAMINERS.

The PRESIDENT said the resolution passed at the last meeting had been submitted to the Boards of Examiners, and they had recommended certain alterations in the Regulations to the effect that in the practical examination in chemistry candidates should be familiar with the construction and use of the balance, and have a practical knowledge of the British and metric systems of weights and measures; but the Boards did not consider it desirable to require, in addition to the practical knowledge of the metric system now exacted for the chemistry part of the examination, a further practical examination in that system in dispensing, or an oral examination in posology. The President, in moving the reception and adoption of the report, and that the proposed alterations be approved by the Council, said he could now speak with certainty on a point as to which he was not absolutely sure at the last meeting, viz., that every candidate both in the north and south used the metric system of weights and measures in his daily work in chemistry, so that practically the suggestions of Mr. Martindale were already in operation. The Boards did not consider it desirable at present to examine in practical dispensing and posology in the metric system. They took the view that the requirements at present in force were quite sufficient. The members of the Scotch Board, in particular, were very strong on the point, and both Boards were agreed. Such a test could not be satisfactorily gone through without considerably more time being allowed for the examination, and it was felt that if a candidate could perform the weighing and measuring necessary for his chemical work, it would be very difficult to say that he was incompetent to dispense a prescription in which the same weights and measures were used. Both Boards were alive to the object which Mr. Martindale had in view, but they believed that even

if dispensing in the metric system were included in the examinations, and the students were examined in posology in those weights, it would not effect what Mr. Martindale desired; that, in fact, the men would think in the English system, and translate into the other; and that until, in fact, a large amount of practical work was done in dispensing in this system throughout the country, the candidates would never have that real practical acquaintance with the system which was aimed at, and that a mere examination would not be sufficient for that purpose. As regarded the safety of the public, the Boards were unanimous that the amount of knowledge exacted from candidates was sufficient to ensure this in any cases in which prescriptions in the metric system were presented.

MR. MARTINDALE said he was sorry the Boards of Examiners had taken this view of the subject. It seemed that though a knowledge of the metric system was required from the candidates, they were not to be trusted to use for practical dispensing a system which he hoped would come into use within the present generation. If they were not to be trusted now, he feared the matter would be put off for an indefinite time. He feared that, as happened in France, it would require some Imperial decree to enforce it, or there would be very little chance of the metric system being generally introduced. It was stated in France, during the time of Louis Philippe, that it was not the needs of commerce which opposed the complete introduction of the system, but the indolence of the people, and he was afraid that it was something of the same sort with British pharmacists and the Boards of Examiners. They feared they would have so much more work to do that they dared not face the subject. He was sorry for the result, for he feared it would delay the introduction of the metric system for an indefinite time.

The PRESIDENT said the Boards of Examiners had no fear of additional work for themselves, but they had to consider as practical men the additional work which would be thrown on the candidates, and how far, having regard to their powers under the Act, they could carry their requirements from time to time. They had made considerable progress during the last few years, and the principle of *festina lente* applied to examinations as well as other things.

The motion was then put and carried.

DIPLOMAS.

The undermentioned, being duly registered as Pharmaceutical Chemists, were respectively granted a diploma stamped with the seal of the Society:—

Anthony, Everard Percival.
Ashby, Charles Edmund.
Athey, George Hedley.
Butler, Ernest Charles.
Cowin, William Stephen.
Cox, Harry Bertrand.
Davies, Robert Fisher.
Dyson, Herbert.
Foden, Thomas Henry.
Gamble, Frederic William.
Gillitt, Albert Ambrose.
Greig, John.
Harvey, Thomas Featherstone.
Hayward, Walter Edwin.
Henry, Thomas Anderson.
Highfield, Henry.
Hill, Aubrey Thomas.
Jackson, Thomas.
Lander, Arthur.
Martin, George Hymers.

Maskew, William.
 Mercer, Frank Norland.
 Roberts, George Daniel.
 St. Cyr, Etienne Laurent Nelvil.
 Southall, Horace.
 Turner, John William James.
 Ward, Joseph William.
 Williams, William.

ELECTION OF MEMBERS.

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Pharmaceutical Chemists.

Ashby, Charles Edmund Sidcot.
 Cowin, William Stephen Braddan, I. of M.
 Cox, Harry Bertrand Shepton Mallet.
 Davies, Robert Fisher Clydach.
 Dyson, Herbert Nottingham.
 Gamble, Frederic William London.
 Gillitt, Albert Ambrose.....Wellingborough.
 Harvey, Thos. Featherstone...Sibley.
 Henry, Thomas Anderson.....Sevenoaks.
 Hill, Aubrey Thomas.....Wisbech.
 Jackson, Thomas Kirkham.
 Lander, Arthur St. Keyne.
 Martin, George Hymers.....Gateshead.
 Maskew, William New Southgate.
 Mercer, Frank Norland.....Farnworth.
 Norman, Edwin Weston-super-Mare.
 Roberts, George Daniel.....Gloucester.
 St. Cyr, Etienne Laurent Nelvil...London.
 Southall, Horace.....Birmingham.
 Turner, John William James..Sheffield.

ELECTION OF ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Hughes, Thomas John Bethesda.
 Lloyd, Henry Morgan Merthyr.
 Scott, Henry Fife Bowmore.
 Williams, Frederick London.

ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Adams, William Wright Birmingham.
 Ahier, Ernest Jersey.
 Allen, John Harry Stanley Leicester.
 Arundel, Edmund Manchester.
 Aves, Ernest Harold Mansfield.
 Baker, William Charles.....Edinburgh.
 Berrill, Edith Annie London.
 Bloor, Frederick Arthur Southport.
 Blyth, Isabella.....Sunderland.
 Bostock, John Wrexham.
 Boyce, Herbert George Dowtham Market.
 Brawn, Harry Samuel Spalding.
 Brees, John Soley Llandidloes.
 Burgess, Sydney Robert Luton.
 Burrell, Benjamin Lawson ...Leeds.
 Burrows, Harry Southgate.
 Coleman, John Harold Wolverhampton.
 Cooper, George Henry Oldham.
 Cundall, Thomas Bowser Pocklington.
 Davies, David Evans Pontypridd.
 Delaney, Edwin Louis London.
 Douthwaite, John Fruithoe.
 Ellington, Charles Sampson ...Rochester.
 Elwell, Frederick Budd.....Landport.

Evans, Evan Castell Llanarth.
 Flood, Fanny London.
 Gaul, Ernest George London.
 Harbin, George Albert Landport.
 Harper, Theophilus Belfast.
 Heekes, John William London.
 Hendry, Fred Harry Hull.
 Hick, Wm. Henry Henwood...London.
 Hirst, Edward Savile Town.
 Holmes, John Bradford.
 Hoole, Herbert Edward.....Sleaford.
 Hough, Thomas Northwich.
 Hughes, Job.....London.
 King, Ebenezer Thomas.....Reading.
 Knight, George Thomas Halesowen.
 Lawson, Albert Edward Shrewsbury.
 Lee, John Cuthbert Wainfleet.
 Lewis, David Evan Cardigan.
 Male, Elliott Wm. Graves.....Soham.
 Marsh, Alfred Edward Luton.
 Mitchell, Donald.....Inverness.
 Murray, Alexander Edinburgh.
 Nicholls, Ralph Devonport.
 Oldham, Harry Hyde.
 Parker, Herbert Charles Stamford.
 Parry, Lewis.....Liverpool.
 Perrett, Henry John London.
 Pitt, Charles Frederick Bristol.
 Potter, Thomas Burbidge Leicester.
 Prior, James Siddall Manchester.
 Richards, Emrys Pontypridd.
 Shattock, John Bellett Bradford.
 Smedley, Walter Graham Northampton.
 Sonley, Walter.....Littleborough.
 Sproston, Francis John Ardwick.
 Stow, Norman Vincent Castle Northwich.
 Strother, Alfred Emmerson ...Newcastle-on-Tyne.
 Thorne, Alfred John Tunbridge Wells.
 Townsend, William Alfred ...Bristol.
 Trounson, Herbert James London.
 Vogt, George Kendal.
 Ward, George Stafford Gloucester.
 Ware, Alan Henry Exeter.
 Wolstenholme, Austin Whiley...York.
 Young, James Clements.....Manchester.

ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Agar, John Parriok Knutsford.
 Atkins, William Newcastle-on-Tyne.
 Atkinson, Frederick Darlington.
 Ball, Ernest Harry Bolton-le-Moors.
 Bryan, David Allen.....Holywell.
 Cashmore, Montague.....London.
 Cowling, Ernest.....Wallingford.
 Crane, William Thomas.....Northampton.
 Davies, William Osborne.....Llandidloes.
 Dawson, Frederick James Botden...Winterton.
 Deck, Reginald Southampton.
 Dennis, James Edward.....Broadstairs.
 Downing, Alfred.....Plymouth.
 Duck, Frederick Edwin...Hull.
 Evans, Harry John Hackney.
 Glover, Charles Crofts.....Ashby de la Zouch.
 Greaves, Alfred Ellis.....Boscombe.
 Hillier, Henry Edgar.....Marlborough.
 Knowles, Charles John.....Forest Gate.
 Little, William Penrice.....Newcastle-on-Tyne.
 Lucas, Alfred Richmond.
 McKechnie, Donald Neil.....Edinburgh.
 Mitchell, Austin.....Sheffield.
 Orrell, William Herbert.....Bolton.
 Patterson, Arthur Colling.....Barnard Castle.

Roberts, John Henry West... Carnarvon.
 Sharp, Herbert Manchester.
 Smith, Albert Wareham.
 Stedman, Charles Richard... London.
 Valentine, William Herbert... Bridgnorth.
 Wadlow, Ernest Harry... Bridgnorth.
 Wearing, John St. Just.
 Whittle, William Wilford... Melton Mowbray.
 Willocks, Edmund Squire... Fratton.
 Woodward, John William... Uttoxeter.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

RESTORATION TO THE REGISTER.

The name of the following person was restored to the Register of chemists and druggists:—

Samuel Henry Venables Gorleston, Suffolk.

REPORT OF THE FINANCE COMMITTEE.

This report was of the usual character, and recommended various accounts for payment, also the purchase of £100 Consols on the Benevolent Fund donation account.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report, which he said called for no special comment, either as regarded the receipts or payments. The recommendation to invest £100 on the Benevolent Fund account was one which he quite concurred in, as he had often noticed that it had a beneficial effect on the subscriptions.

The report was unanimously adopted.

REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included recommendations of the following grants:—

£10 to the widow (44) of a former subscriber to the Society. She had a grant of £15 in 1885, and one of £5 in January, 1888, is recovering from a long illness, and has two children of 11 and 8 years respectively (Liverpool).

£20 to the widow (42) of an associate who subscribed to the Fund. Since her husband's death she has been a lecturer and demonstrator in cookery, but has broken down in health, and the application was on behalf of her two girls, aged 7 and 12 respectively (London).

One other application had not been entertained.

The VICE-PRESIDENT, in formally moving the reception and adoption of the report, said it contained no special features, and it was unanimously adopted without comment.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
June ... { Day . .	626	36	16	24	
{ Evening .	229	19	6	11	

	Circulation of Books.	Total.	Town.	Country.	Carriage paid.
June	218	134	84	18s. 3½d.	

Donations to the Library had been announced (*Pharm. Journ.*, July 14, p. 34), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

For the Library in London—

Frankland, Micro-organisms in water.
 Chambers' Encyclopaedia.
 Quain, Dictionary of Medicine, 2nd ed.

For the Library in Edinburgh—

Pereira, Selecta à prae scriptis, new ed., 2 copies.
 Quain, Dictionary of Medicine, 2nd ed.
 Vines, Text-book of Botany.
 Oliver, Systematic Botany.
 Sawyer, Odorographia, 2nd series.
 Phillips, Materia Medica.

The Committee had also recommended that a new book-case be erected in the west Library (old Council room).

The Committee had further recommended that the Librarian be authorised to attend the annual meeting of the Library Association at Belfast in September.

Museum.

The Curator's report had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
June . . . { Morning	611	41	10	23	
{ Evening	88	12	1	3	

Donations to the Museum had been announced (*Pharm. Journ.*, July 14, p. 34), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Curator had submitted a report of the first annual meeting of the Museums Association, held in Dublin on June 20.

The staff of the Society's School had attended and reported on the various classes.

The Committee recommended that the Library and Museum in London and Edinburgh be closed in the evening during August and September, also that the Library and Museum in London be closed entirely from September 1 to 14, and in Edinburgh from August 1 to 15.

The Committee recommended that certain cleaning and repairs be carried out during the vacation.

Also that the Inaugural Sessional meeting take place on Wednesday, October 3, at 3 p.m.

A letter was read from Mr. E. F. Harrison, resigning his position as assistant lecturer in chemistry. A communication had also been received from Professor Dunstan, pointing out the importance of having some systematic and practical teaching in physics, and suggesting that Mr. H. A. D. Jowett, B.Sc., be appointed assistant lecturer in the place of Mr. Harrison, and that Mr. Jowett should undertake a course of instruction in physics and practical physics, separate from the subject of chemistry.

The Committee recommended that the suggestion as to the teaching of physics be adopted, and that Mr. Jowett be appointed assistant lecturer in chemistry during the ensuing season, with an annual stipend of £50, he undertaking the instruction in physics; and that £30 be granted for the purchase of physical apparatus.

In consequence of the resignation of the present lecture-room attendant, the Committee recommended the appointment of a new lecture assistant, with a stipend of £40 per annum.

The Committee having considered the communication from the Colonial Office concerning the new poison law in Jamaica, recommended that the President be requested to call the attention of the Marquess of Ripon to clauses 7 and 25, of law 34 of 1894.

The PRESIDENT, in moving the reception and adoption of the report, said the greater part of it was merely formal, and called for no remark. The resignation of Mr. Harrison necessitated a new election, and Professor Dunstan attended the Committee in person.

and explained that Mr. Jowett had done extremely good work in the Research Laboratory, and had been so industrious that he had passed his B.Sc. examination. He had filled up his spare time—which he got goodness only knew where—in such an acquisition of practical physics as was highly creditable to him. In these circumstances the Committee thought it desirable to utilize his services. They were not in a position to recommend the foundation of what was generally termed a physical laboratory, but they would place at the disposal of students one of the laboratories and the lecture room, and give them an opportunity of handling the apparatus and performing physical experiments. It was not intended that the office should be held for a definite time, but they desired to encourage young men to come forward and from time to time hold this office. The stipend would be nominal, but it would encourage capable and deserving men, like Mr. Jowett, to get on the scientific ladder, and become a credit to the school, as well as to themselves. As to the lecture-room attendant, they were not making a new appointment, but simply converting a weekly payment into an annual one; and they found a number of candidates for a post affording opportunities of gaining knowledge and of doing practical work. The fact that such knowledge could be acquired was proved in the case of Mr. Bodey, who, commencing his career at University College, Bristol, as a boy under Professor Ramsay, subsequently served under his successor, Mr. Sidney Young, and coming to them (the Pharmaceutical Society) when about twenty-one, at a small weekly stipend, had, through his industry and perseverance, now obtained a teachership of chemistry under the School Board in the North of London. This showed the work they were able to encourage, and also that they were ready to help in the advancement of deserving students.

Mr. MARTINDALE having seconded the adoption of the report, it was put and unanimously carried.

GENERAL PURPOSES COMMITTEE.

The report of this Committee included the following reports on the Prize Examinations:—

Practical Chemistry.

Professor ATTFIELD had reported that there had been sixty-three students in this class, rather below the average of the last ten sessions. The records of the daily work and weekly revision classes showed that the session had been an average one as regards the general mental calibre of the students and the work done.

Chemistry.

Professor DUNSTAN had reported that there were six candidates for the prizes, all of whose papers were highly creditable, the lowest award being more than 50 per cent., the two Bell scholars heading the list.

Materia Medica.

Professor GREENISH had reported the total number of entries as twenty-four, the average attendance being twenty. The general conduct of the class had been good, and the progress made above the average. Five students only competed for the prizes, but the work done was extremely satisfactory.

Pharmacy and Practical Pharmacy.

Mr. INCH reported that seven candidates had entered for the prize examination, and that the work and attendance during the summer term had been most satisfactory.

Botany.

Professor GREEN had reported that seven candidates competed for the prizes in this class, all of whom did well, and four particularly so.

Herbarium.

Professor GREEN had reported the receipt of two collections, one by Mr. John Wishart, of Ince, and one by Mr. Charles Kent, of Brighton. He recommended the award of a bronze medal to the former and a certificate of honour to the latter.

Prize Awards.

Acting on the foregoing reports, the Committee had recommended that the following awards be made:—

Practical Chemistry.

Silver Medal.....Charles Edmund Ashby.
Certificates of Honour... { Thomas Anderson Henry.
Charles John Taylor.
Arthur Lander.

Chemistry.

Silver Medal.....Thomas Anderson Henry.
Certificates of Honour... { Charles Edmund Ashby.
Thomas Jackson.
Aubrey Thomas Hill.

Botany.

Silver Medal.....Aubrey Thomas Hill.
Certificates of Honour... { Thomas Anderson Henry.
Charles Edmund Ashby.
Charles John Taylor.

Materia Medica.

Silver Medal.....Thomas Anderson Henry.
Certificates of Honour... { Charles John Taylor.
Arthur Lander.

Pharmacy

Silver Medal.....Charles John Taylor.

Council Examination Prizes.

Messrs. D. B. Dott and J. Jack, who had been appointed to conduct this examination, had reported that fifteen candidates competed for these prizes, and made the following awards:—

Pereira Medal (Silver); and Books value £5, presented by the late Thomas Hyde Hills.

Aubrey Thomas Hill.

Pharmaceutical Society's Medal (Silver); and Books value £3, presented by the late Thomas Hyde Hills.

Charles Edmund Ashby.

Pharmaceutical Society's Medal (Bronze); and Books value £2, presented by the late Thomas Hyde Hills.

Frederic William Gamble.

The following are the mottoes adopted by the fifteen candidates for the Council Prizes, and are arranged in order of merit:—1, Cantab; 2, Palmam qui meruit ferat; 3, Liber; 4, Semper eadem; 5, Dum spiro spero; 6, Excelsior; 7, Sapere aude; 8, Meconium; 9, Conatur; 10, Post fata resurgo; 11, Adjuvante; 12, Nil desperandum; 13, Crassula; 14, Aide toi le ciel l'aidera; 15, Hope.

THE JACOB BELL MEMORIAL SCHOLARSHIPS.

The examiners appointed to conduct the examination for the Jacob Bell Scholarships had reported that twenty-two candidates had competed for the scholarships at the following centres:—Aberdeen, 1; Birmingham, 2; Bristol, 1; Carlisle, 1; Edinburgh, 1; Leeds, 1; Liverpool, 8; London, 7; Newcastle, 1; Manchester, 2; Northampton, 1; York, 1.

The envelopes bearing the mottoes of the successful candidates had been opened by the Committee appointed to make the award, and had been found to contain the names of the following:—

Harold Brown Southport.
John Robert Walker Cockermouth.

The Committee had awarded the Scholarships to Mr. Brown and Mr. Walker, subject to the approval of the Council.

The following are the mottoes of the other competitors, placed in order of merit:—

3, Nil desperandum (No. 1); 4, For God's sake; 5, Spero magnopere; 6, In medias res; 7, Neutral; 8, Time flies; 9, Ego and Perseverance, equal; 10, "979"; 11, Dum spiro spero (No. 1); 12, Homo Latinissimus; 13, L'union fait la force; 14, Mente Manuque; 15, Cogito ergo sum; 16, Dum spiro spero (No. 2); 17, Nothing succeeds like success; 18, For God and country; 19, Ne cede malis; 20, Nulla dies sine linea; 21, Nil desperandum (No. 2).

MANCHESTER PHARMACEUTICAL ASSOCIATION SCHOLARSHIP.

The Committee reported that one candidate sat for the examination for this Scholarship, but that he had failed to obtain the standard of marks entitling him to the award of the Scholarship.

REDWOOD SCHOLARSHIP.

The PRESIDENT reported that the Research Committee had had three applications for the Redwood Scholarship, and had suggested that the Scholarship be awarded to Mr. T. A. Henry, one of the Bell scholars of the present year. The Committee recommended that this suggestion be adopted.

The PRESIDENT moved the adoption of this portion of the report, and the consequent award of the prizes.

The resolution was carried unanimously.

A resolution was also passed authorising the payment of £45 to Mr. Tickle to enable him to continue his attendance in the Research Laboratory another year.

The PRESIDENT said the report of the Research Committee was made on the preceding evening to the General Purposes Committee, and he had also had an opportunity of seeing the report of the Examiners on the Manchester Pharmaceutical Association Scholarship. Finding the Examiners were not able to award the Scholarship, the Council could not do otherwise than accept the report, but he had communicated with Mr. Bengier and Mr. Woolley, the President of the Association, and they had in turn communicated with the founder of the Scholarship, and they concurred in the suggestion that the money, which would otherwise be lying idle, should be allowed to Mr. Tickle to enable him to continue his attendance in the Research Laboratory for another session. It would be some gratification to those gentlemen to know that their similar action last year, when the money was allotted to Mr. Jowett, had been productive of good results, that gentleman being now appointed an assistant lecturer in the Society's School, especially as Mr. Jowett came from the district in which the money was raised.

Votes of thanks were unanimously passed to Messrs. Gerrard, White, and Pinches for conducting the Jacob Bell Scholarship examination, and to Messrs. Dott and Jack for conducting the Council Prizes examination.

REPORT OF EXAMINATIONS.

July, 1894.

	Candidates.		
	Examined.	Passed.	Failed.
England and Wales:—			
Major	47	26	21
Minor	291	122	169
Total	—338	—148	—190
Scotland:—			
Major	8	2	1
Minor	137	57	80
Total	—140	—59	—81

First Examination.

Examined.	Passed.	Failed.
490	237	253

28 Certificates by approved examining bodies were received in lieu of the Society's examination.

CONFERENCE OF LIBRARIANS.

The PRESIDENT said that a letter had been received from Mr. Macalister, hon. sec. of the Library Association, announcing the approaching annual meeting at Belfast, to be presided over by Lord Dufferin, and saying he believed it would be one of the most successful and practical meetings yet held; also inviting the Council to nominate delegates to attend the meeting. Their librarian (Mr. Knapman), the President added, would attend, and he would suggest that he be appointed a delegate. He did not know whether Mr. Atkins or any other gentleman interested in libraries would like to be appointed also. No doubt it would be an excellent meeting, and Irish hospitality was proverbial.

Mr. ATKINS was sorry he could not see his way to attend the meeting; otherwise he should have been glad to do so.

Mr. Knapman was accordingly appointed a delegate to attend the Conference.

THE PHARMACY BILL.

The PRESIDENT also announced the receipt of a letter from Mr. Cox, hon. sec. of the Three Towns and District Chemists' Association, enclosing a resolution passed on July 12 in support of the Pharmacy Bill recently drafted, and also thanking the Council for their donation recently made to the Society.

CARBOLIC ACID AS A POISON.

The PRESIDENT likewise read a letter from Mr. Sidney Taylor, Deputy Coroner for Buxton, enclosing the recommendation of a jury, at a recent inquest over which he had presided, that carbolic acid be scheduled as a poison. The President added that he would propose that the Secretary be instructed to write to the Deputy Coroner asking him to forward the recommendation to the Privy Council, and this was agreed to.

THE HOLIDAYS.

The PRESIDENT announced that the Council would not meet in September, the next meeting being held on the 3rd of October, and at three o'clock in the afternoon of that day, following the meeting of the Council, the inaugural address would be delivered.

The Council then went into committee, as usual, to consider the legal portion of the report of the General Purposes Committee. This included the monthly letter from the solicitor as to the progress of cases placed in his hands.

A large number of fresh cases of infringement of the Pharmacy Acts were reported to the Committee and in each case proceedings were recommended.

On resuming, the report and recommendations were adopted, and a resolution was passed authorising proceedings against the persons named in the resolution.

British Pharmaceutical Conference.

MEETING AT OXFORD.

FIRST DAYS' PROCEEDINGS.

(Continued from p. 110).

READING OF PAPERS.

The reading of papers was then proceeded with, the first two being considered together.

NOTE ON THE STABILITY OF THE ALKALOIDAL TINCTURES.

BY R. H. FARR AND R. WRIGHT, F.C.S.,
Pharmaceutical Chemists.

The question of the stability or otherwise of galenic preparations like tinctures is of considerable importance from a medical and pharmaceutical standpoint, because it is evident that in so far as such preparations are liable to undergo alteration in composition, either through the separating out of any of the principal constituents, or through changes taking

place in the characters and properties of any of the active principles, by so much will the preparations themselves be rendered uncertain in strength and, consequently, unreliable in effect. The question assumes an added importance on account of the present disposition of opinion in favour of standardised preparations; and still more so in view of the fact that it is more than probable that the publication of the forthcoming edition of the British Pharmacopœia will witness a considerable extension in the application of the principle of standardisation to preparations of potent drugs.

Now, if it were proved impossible to keep a preparation up to standard strength after being standardised, this fact would in itself constitute a great, if not an insuperable barrier in the way of carrying out any such system of standardisation as we have advocated for several years past. During the progress of our work on tinctures we therefore took the precaution to preserve specimens of each of the tinctures operated upon, intending, as soon as time and oppor-

Table showing Results of Determinations of Alkaloidal Tinctures.

Tincture.	Date of First Estimation.	Percentage of Alkaloid.	Date of Second Estimation.	Percentage of Alkaloid.
Aconite.....1	Jan. 6, 1891	·054	March, 1894	·054
2	Jan. 9, 1891	·050	Dec. 7, 1893	·048
3	Jan. 9, 1891	·066	Dec. 8, 1893	·060
Average.....	—	·056	—	·054
Belladonna.....1	Aug. 18, 1891	·024	March, 1894	·024
2	Aug. 18, 1891	·026	March, 1894	·025
3	Aug. 24, 1891	·039	Nov. 14, 1893	·039
4	Aug. 24, 1891	·038	Nov. 14, 1893	·038
Average.....	—	·032	—	·032
Cinchona.....1	March, 1893	1·29	April, 1894	1·27
2	March 27, 1893	1·00	Feb. 22, 1894	·95
Average.....	—	1·14	—	1·11
Colchicum.....1	Nov. 14, 1890	·096	April, 1894	·092
2	Nov. 14, 1890	·058	April, 1894	·058
3	Dec. 9, 1890	·079	Dec. 21, 1893	·080
4	Dec. 9, 1890	·080	Dec. 19, 1893	·076
Average.....	—	·078	—	·077
Conium.....1	Oct. 6, 1890	·158	March, 1894	·154
2	Oct. 16, 1890	·090	Dec. 15, 1893	·090
3	Oct. 16, 1890	·098	Dec. 15, 1893	·096
Average.....	—	·115	—	·113
Gelsemium.....1	Oct. 22, 1891	·020	April, 1894	·019
2	Oct. 16, 1891	·047	Nov. 30, 1893	·048
3	Oct. 16, 1891	·068	Dec. 5, 1893	·066
Average.....	—	·045	—	·044
Hyoscyamus.....1	July 23, 1891	·012	March, 1894	·012
2	July 23, 1891	·011	March, 1894	·011
3	March 20, 1891	·013	Nov. 17, 1893	·0125
4	March 20, 1891	·0135	Nov. 17, 1893	·013
Average.....	—	·0124	—	·0121
Jaborandi.....1	Feb. 14, 1891	·112	March, 1894	·106
2	Feb. 14, 1891	·080	March, 1894	·081
3	Feb. 16, 1891	·134	Nov., 1893	·130
4	Feb. 16, 1891	·140	Nov. 28, 1893	·136
Average.....	—	·116	—	·113
Lobelia.....1	July, 1892	·028	April, 1894	·029
2	July 22, 1892	·044	Nov. 21, 1893	·044
3	July 22, 1892	·042	Nov. 22, 1893	·041
Average.....	—	·038	—	·038
Stramonium.....1	Sept., 1891	·032	March, 1894	·032
2	Sept., 1891	·030	March, 1894	·030
3	Sept., 1891	·027	March, 1894	·028
4	Sept., 1891	·030	March, 1894	·029
Average.....	—	·030	—	·030
Veratrum Viride.....1	July, 1892	·184	April, 1894	·176
2	July, 1892	·212	April, 1894	·192
3	Dec. 15, 1891	·140	Dec. 9, 1893	·138
4	Dec. 15, 1891	·158	Dec. 12, 1893	·150
Average.....	—	·178	—	·164

tunity would allow, to turn our attention to the question as to whether or not those tinctures, the active principles of which are capable of ready and accurate determination, suffered any diminution in strength when kept for a length of time. It was also thought that inferentially the results of this inquiry might tend to throw light upon the same question in its application to other tinctures not brought under examination, or at any rate that they might not be without interest in their bearing upon that point. All the tinctures examined have been kept for twelve months, at least, the majority of them for a space of two or three years. The processes employed for the determination of the alkaloids have been precisely the same as those originally followed, and will be found published in the individual papers, references to which are given in the 'Year-Books' for 1890-93.

The results obtained prove that the strength of these tinctures, so far as can be judged from the determination of their alkaloidal constituents, remains approximately the same for a considerable length of time, and it may fairly be assumed that when preserved under normal conditions, such preparations remain constant in composition. The only cases in which any notable loss of alkaloid is apparent are those of the tinctures of cinchona and green hellebore; and this loss is doubtless due to the mechanical carrying out of solution of traces of alkaloid by deposited resinous and extractive matter. The average loss in the most extreme case, that of the tincture of green hellebore, does not amount to 5 per cent. of the alkaloid originally present.

GRAVIMETRIC AND VOLUMETRIC METHODS FOR THE DETERMINATION OF THE ALKALOIDS IN ALKALOIDAL TINCTURES.

BY E. H. FARR AND R. WRIGHT,
Pharmaceutical Chemists.

Probably the first systematic attempt to devise a method for the approximate determination of the alkaloids in galenical preparations was made by A. B. Lyons (*Amer. Journ. Pharm.*, Dec., 1886, and Jan., 1887), who recommended for that purpose the titration of acidulated solutions of the crude alkaloids with Mayer's reagent. This process was found to have many disadvantages, and Lyons himself has admitted that the results obtained by it have at best only an approximate value. The chief drawbacks of the method are that the amount of the volumetric solution used up varies with the acidity of the alkaloidal solution, the volume of the liquid, and the amount of alkaloid present. To which must be added that most of the precipitates produced are also soluble in the mother liquor, and hence it is necessary to make a correction for the solubility of the alkaloidal precipitate. These facts have served to bring the method of titration by Mayer's solution into disrepute, and although in the hands of an analyst accustomed to work with it the process may be capable of yielding fairly accurate results, it is impossible that the use of such a process will ever become general.

A gravimetric process for the determination of the alkaloids in certain extracts and tinctures was subsequently proposed by J. U. Lloyd ('Proc. Amer. Pharm. Assoc.', 1891). This consists in mixing a measured volume of the preparation to be assayed with ferric chloride, adding to the mixture a sufficient quantity of sodium bicarbonate to form a magma, and extracting the alkaloid with chloroform. In some cases a process of purification was recommended, which consisted in shaking out the alkaloids with acidulated water, rendering the solution alkaline, and extracting with chloroform. Lloyd's assay process was very severely criticised by J. B. Nagelvoort, and there is no doubt that the figures obtained by this process are liable to

be as much below the mark as those yielded by that of Lyons are above it.

In 1889 a series of papers on tinctures was published by F. W. Fletcher (*Chemist and Druggist*, January, 1889), in which definite proposals were made for the fixing of minimum standards of strength for tinctures containing alkaloids, and processes for the isolation and gravimetric determination of the alkaloids were given.

A. H. Allen, in his 'Handbook of Commercial Organic Analysis' (2nd edition, vol. iii., part ii., p. 181), has recommended a process of titration, the crude alkaloid, obtained by shaking out, being dissolved in ether or chloroform and the solution titrated with $\frac{\text{HCl}}{50}$, methyl orange being used as indicator; and in

a paper on neutrality, read before the London Chemists' Assistants' Association (*Pharm. Journ.*, [3], xii., 774), also gave a useful table, showing the behaviour of the more important alkaloids towards methyl orange, phenol-phthalein, and litmus.

The subject of the titration of alkaloids has also been dealt with by R. A. Cripps (*Pharm. Journ.*, [3], vol. xii., p. 511), who, in a valuable contribution to the literature of the subject, has shown how, by the aid of delicate indicators like methyl orange, iodeosine, gallein, etc., minute quantities of alkaloids can readily be determined. In a note published in the *American Pharmaceutical Review*, November, 1892, Professor C. Caspari maintained that the alkaloidal residues yielded by gravimetric methods invariably contained from 10 to 20 per cent. of impurities, and asserted the marked superiority of volumetric processes of determination. He advocated a process consisting in the solution of the crude alkaloid in excess of $\frac{\text{HCl}}{10}$, and titrating back with $\frac{\text{N}}{100}$ alkali, using Brazil wood as indicator.

Lastly, in a paper read before the American Pharmaceutical Association last year, entitled "The Value of Titration with Volumetric Acid Solution as a Means of Assaying Drugs and Galenical Preparations," Messrs. Caspari and Dohme have claimed to show that the determination of alkaloids in galenical preparations may be effected more accurately by titration than by the usual plan of weighing.

As during the course of our work on the subject we have employed gravimetric processes of determination almost exclusively, it appeared to us absolutely necessary to test the conclusions advanced by Caspari and Dohme, in order to ascertain whether they had any foundation in fact. With this object in view, each of the alkaloidal tinctures previously submitted to examination was prepared in quantity sufficient to admit of the determination of the alkaloids being carried out by the following processes:—

1. Two gravimetric determinations by methods described in our notes on tinctures.
2. The tincture was evaporated, the residual liquor rendered alkaline, and the alkaloid extracted with chloroform. Except in the cases of veratrum, lobelia, and colchicum, the alkaloid was once purified by shaking out with acidulated water, rendering the solution alkaline, and again extracting with chloroform. The chloroformic solution was then washed with a little distilled water before being titrated. When ammonia was used as a precipitant of the alkaloid the washing was repeated until the water, on separation, ceased to become pink on addition of phenol-phthalein. The chloroformic solution thus obtained was utilised for the direct titration of the alkaloids with $\frac{\text{HCl}}{20}$, methyl orange, iodeosine, and phloxine being used as indicators in the separate experiments.

ments. In using methyl orange, a little distilled water is added along with two drops of the indicator; but with iodeosine or phloxine a single drop of a 1% solution is sufficient, and this is shaken up with the chloroformic solution until the chloroform has become distinctly coloured. The indication of the end of the reaction is in the case of methyl orange the appearance of a slight pink colour in the aqueous layer, and where iodeosine or phloxine is employed the decolorisation of the chloroform marks the end of the reaction.

3. The alkaloid as obtained by the usual gravimetric process was dissolved in a calculated excess of standard acid (usually 4 or 5 C.c.), the indicator added, followed by the addition of standard Ba2HO until the neutral point was reached. These determinations are preferably made in a white porcelain dish in which the alkaloid has previously been obtained, the slight changes in colour are thus more easily recognised.

The indicators used were methyl orange and Brazil wood, supplemented where the volume of the tincture available would allow by iodeosine and phloxine. In this case the indication of the end of the reaction, when methyl orange is employed, is the disappearance of the pink tint, and with Brazil wood the production of a purple colour. In the employment of iodeosine and phloxine as indicators, except in direct titration, we have followed the plan recommended by Cripps in the paper referred to above, of adding to the acid alkaloidal solution sufficient neutral ether to leave a distinct supernatant layer when shaken up with the solution. The indication of the end of the reaction is the production of a pink tint in the lower layer. In the determinations, the results of which are recorded in the table, $\frac{N}{30}$ hydrochloric acid has been employed, as

an acid of this strength will be found generally suitable for use in determining alkaloidal residues from tinctures. A standard acid of this strength will also keep indefinitely. Of the alkalies, barium hydrate is undoubtedly by far the most suitable, both because it gives a quicker reaction than potassium or sodium hydrate, and also because the absorption of carbon dioxide is soon evidenced by the turbidity of the solution. The exact strength of the solution employed is not very material, so long as its value in terms of the standard acid is known; and owing to the facility with which it absorbs carbon dioxide from the air, it is necessary to ascertain its neutralising power before each determination. It is, perhaps, not advisable to work with a stronger solution than one of $\frac{N}{30}$ strength.

Each C.c. of such a solution will contain $\frac{0.0171 \text{ Gm. HCl}}{20}$. Ba2HO, and will neutralise 0.4 C.c. $\frac{\text{HCl}}{20}$.

The following were the indicators used:—

Methyl Orange.—A tincture containing 1 grain of methyl orange dissolved in a fluid ounce of proof spirit.

Brazil Wood.—The U.S.P. test solution. This is made by boiling 50 grammes finely cut Brazil wood with 100 C.c. distilled water for half an hour, replacing the water lost from time to time. The mixture is allowed to cool, the liquor strained off, water added to 100 C.c., and a further addition made of 25 C.c. alcohol and the whole filtered.

Iodeosine and Phloxine.—An aqueous solution containing 1 part in 1000 fluid parts.

The following is the list of the equivalents from which the results recorded in the table have been calculated.

Tincture of	HCl	Alkaloid.
Aconite 1 C.c.	$\frac{\text{HCl}}{20} = .03225 \text{ Gram.}$	Aconitine.

Tincture of	HCl	Alkaloid.
Belladonna	$\frac{\text{HCl}}{20} = .01445 \text{ Gram.}$	Atropine
Stramonium		or Hyoscyamine.
Hyoscyamus		
Cinchona 1 C.c.	$\frac{\text{HCl}}{20} = .0154 \text{ Gram.}$	mixed Alkaloids.
Gelsemium	" = .0183 "	Gelsemine.
Conium	" = .00625 "	Conine.
Opium	" = .01425 "	Anhydrous Morphine.
Jaborandi	" = .0108 "	Pilocarpine.
Nux vomica	" = .0182 "	Mixed Alkaloids.
Lobelia	" = .01425 "	Lobeline.
Veratrum	" = .0253 "	Mixed Alkaloids.
Colchicum	" = .0165 "	Colchicine.

In the case of cinchona, nux vomica, and veratrum the equivalents are calculated by taking the mean of the molecular weights of the chief alkaloids.

The results obtained are embodied in the accompanying table (see page 126).

Notes on results.

1. Volumetric methods appear useless for the determination of the alkaloids of aconite, the large proportion of aconine present (equivalent .02715) making the readings much too high.
2. They are also useless in the case of preparations of colchicum, which appears to contain a small percentage of an alkaloid having definite basic properties, probably colchicine, with a considerable proportion of some other possibly equally active but chemically indifferent substance.
3. Gelsemium contains two alkaloids, gelsemine and gelseminine, the former crystalline, the latter amorphous. Gelseminine is said to be present in the drug only in small proportion. The formula of gelsemine has been given by Gerrard as $\text{C}_{24}\text{H}_{39}\text{N}_3\text{O}_4$, by Sonnenschein as $\text{C}_{22}\text{H}_{35}\text{N}_3\text{O}_4$, by Cushing as $\text{C}_{19}\text{H}_{29}\text{N}_3\text{O}_4$, while the latest researches of L. Spiegel cause him to hesitate between the formula given by Gerrard and the alternative formula, $\text{C}_{22}\text{H}_{35}\text{N}_3\text{O}_3$, with which some of the results of his experiments agree better.

The figures given in the table are calculated upon the basis of the alternative formula of Spiegel.

4. The titration of the cinchona bases is attended with great difficulty, owing to the end reaction being almost unobservable. With extreme care fairly accurate results may be obtained, but our experience with this tincture has been such as to cause us unhesitatingly to condemn the application of any volumetric process to the assay of this tincture. In several instances the results indicated by titration were exactly twice as great as those obtained by weighing.
5. The volumetric determinations of the alkaloids in the tinctures of veratrum examined yielded results approximating very fairly to those of the gravimetric determination, but the formula weights of the alkaloids of veratrum differ so widely that such comparative accuracy could by no means be generally relied upon.
6. The tinctures which lend themselves most readily to determination by titration are those of belladonna, henbane, stramonium, conium, jaborandi, lobelia. Nux vomica and opium (for morphine). As a general process the following method of determination is put forward with some degree of confidence as one which would, we think, be found in some cases almost equally reliable and somewhat more expeditious than gravimetric processes. "From 25 to 50 C.c. (in the case of hyoscyamus 100 C.c.) of the tincture to be determined is introduced into a porcelain dish and evaporated over a water-bath, with addition of water if necessary, until all alcohol has been driven off. The residual extract is acidified and filtered through cotton wool into a stoppered separator, the dish and filter being

Table showing Comparative Results obtained in Determining Tinctures (a) Gravimetrically and (b) Volumetrically.

Tincture.	Alkaloid by weight mean of two experiments.	Alkaloid indicated by direct titration of chloroformic solution with $\frac{N}{20}$ HCl.			Alkaloid indicated by dissolving crude alkaloid in excess of $\frac{N}{20}$ HCl and titrating back with $\frac{N}{100}$ Ba ₂ HO.			
		Methyl Orange.	Iodoesine.	Phloxine.	Methyl Orange.	Brasil Wood.	Iodoesine.	Phloxine.
Aconite	1		·018	·019	·020		·018	·018
	2		·014	·019	·022		·022	·025
Belladonna	1		·022	·022	·022	·022	·020	·020
	2		·031	·032	·031	·032	·032	·030
Cinchona	1		·074	·144	·078		·072	·071
	2		·087	·087		·052		
Conium	1		·047	·042	·042	·042	·042	·042
	2		·024	·024	·024	·023	·024	·024
Colchicum	1		·024		·005			·005
	2		·028		·006		·005	
Gelsemium	1		·019	·018	·019	·017	·018	·018
	2		·024	·020	·027	·024	·024	·024
Hyoscyamus	1		·005	·005	·005	·005	·005	·005
	2		·009	·010	·008	·008	·008	·0086
Jaborandi	1		·020	·018	·017	·017	·017	·017
	2		·018	·017	·018	·018	·017	·018
Lobelia	1		·009	·009	·008	·008	·008	·008
	2		·009	·009	·007	·008		
Nux Vomica	1		·043	·044	·043	·042	·041	
	2		·066			·066	·066	·065
Opium*	1		·100		·095	·094	·095	·094
	2		·100		·099	·099	·097	·099
Stramonium	1		·011	·011	·011	·011	·010	·010
	2		·017	·017	·017	·017	·016	
Veratrum Viride ...	1		·023	·022	·019	·020	·019	
	2		·027	·020	·023	·021	·024	·019

* For the opium determinations a solution of anhydrous morphine obtained in estimating the tincture by the B.P. process was employed; this was dissolved in excess of $\frac{N}{20}$ HCl.

N.B.—Inst ad of distilling the chloroform from the chloroformic alkaloidal solution by means of a gentle heat, and dissolving the alcohol in $\frac{N}{20}$ HCl, then a kaloid may be determined by shaking out with a measured excess of $\frac{N}{20}$ HCl, and titrating back with $\frac{Ba_2HO}{20}$.

washed with acidulated water, and the washings added to the contents of the separator. The acid liquid is then shaken with two successive portions of chloroform and the latter drawn off. The separated chloroform is washed with a little acidulated water, and after separation the latter is removed and added to the contents of the separator. The liquid in the separator is then made alkaline and the alkaloids taken out by shaking with three successive small quantities of chloroform. The chloroformic solutions are drawn off into a cylinder provided with a good cork, and when ammonia has been employed as the precipitant, washed with distilled water until the washings cease to give a pink tint with phenol-phthalein. A drop of $\frac{Iodoesine}{1000}$ solution is then added, and the whole well shaken until the chloroform is distinctly tinted, $\frac{HCl}{20}$ is then

carefully run in from a burette graduated to tenths of a C.c., the mixture being well shaken after each addition of the acid until the colour is discharged from the chloroform. The reading is now taken, and the amount of alkaloid calculated from the proper equivalent. This process is not applicable to tincture of lobelia, the alkaloid from which must be obtained in ethereal or chloroformic solution by the process published in the *Chemist and Druggist*, vol. xlii., p. 464. It is only necessary to say, in conclusion, that while we admit that the application of volumetric methods of determination to the alkaloids obtained from tinctures is sometimes useful as affording a check upon the

results obtained by gravimetric methods, we still maintain that the results yielded by the latter are, if anything, the more reliable of the two. And while the former may be more in favour with scientific chemists and thoroughly competent analysts, the latter are the processes for the practical pharmacist.

The PRESIDENT said these papers were very valuable, but would have been much more so if the authors had prepared large diagrams containing the tables referred to.

Mr. WRIGHT said he took the trouble to do this last year, and was rather surprised to find that no one attempted to make any use of the diagrams, which he had spent many hours in preparing.

Mr. UMNEY said there were three things quite clear, first, that this paper could not be discussed, because it covered such a vast field that it was impossible to take it in on merely hearing it, and though he sympathised with Mr. Wright, he must say that the tables would have been of some service in following the paper. In the next place, pharmacists throughout the world were very much indebted to the authors for having cleared up matters which had been in doubt for years. They had been using tinctures of belladonna, henbane, colchicum, cinchona, etc., without being at all sure whether they were at all uniform in strength, or whether their potency could be accurately determined, but they had now, as the result of an immense amount of experiment, some definite information on these matters. Thirdly, they had

definite opinion that at least ten or a dozen of these tinctures could be standardised, and he hoped when the new pharmacopoeia came out, the leading tinctures which physicians were accustomed to prescribe would be put in a standardised form, so as to be at any rate a little in advance of the pharmacy of the last half century.

Mr. MARTINDALE also spoke of the great importance and interest of these papers, especially as regarded the keeping properties of tinctures. As far as he gathered there were two which did lose a notable amount of their properties on keeping, one of which he thought was conium.

Mr. WRIGHT said conium was fairly stable, the two he specially mentioned were cinchona and veratrum.

Mr. MARTINDALE said he was going to suggest that in those cases an acetic tincture might be made. In the case of conium, if that were found to change, the alkaloid might be fixed by acetic acid, but that might not apply to cinchona. He agreed that in many cases the gravimetric method of analysis was superior to the volumetric for this reason, that, as Mr. Umney once said, he believed in what he could see and weigh, and, he would add, in what could be crystallised; or if the percentage could not be given in crystallisable salts or alkaloids—as in the case of jaborandi, which contained a liquid alkaloid, likely to be contaminated by the so-called principle jaborine, which might itself be a derivative from the decomposition of pilocarpine—yet at all events the crystallisable salt, the nitrate, was insoluble in alcohol, and a process might be devised for getting that crystallisable body in a definite condition and weighing it, if the percentage of liquid alkaloid were at all doubtful.

Mr. GROVES said he would like to know the exact conditions under which the tinctures were kept. He would also remark that many of these drugs contained more than one alkaloid, and that these varied in strength, and some had no activity at all, so that the mere determination of the total alkaloids, though useful for some purposes, did not indicate the activity of the drug.

Mr. PARKER asked if any investigation of vinum colchici had been made by the authors.

Mr. MOSS agreed with the President as to the great desirability of having diagrams of the tables in such papers; they assisted the mind, and obviated a great strain on the memory in endeavouring to follow the paper. Even if the diagrams were not referred to at set time, he had no doubt they were of great assistance. Mr. Martindale had drawn attention to the great constancy of these tinctures after being kept two or three years, which was very striking. This, of course, only referred to the total amount of alkaloids, whether determined gravimetrically or volumetrically, and did not touch the point raised by Mr. Groves as to their activity. Another point to which attention was directed was the different results obtained with regard to tincture of colchicum by the two methods. In the first paper he thought the final strength of the tincture of colchicum, No. 1, as about twice that of No. 2; and although the two tinctures remained constant, he thought the difference between the two strengths suggested a difference in the character of the drug from which they were prepared; probably they were from different samples, or from different sources. He wished to add his testimony to the infinite pains the authors must have taken over a long period to produce these results.

Mr. ALCOCK asked if the tinctures on re-examination were found pure and bright. They all knew that there was often a deposit in a tincture some time after it was prepared, and the question of what was contained in that deposit might be cleared up if it were ascertained that the alkaloidal tinctures remained bright,

or if a loss of alkaloid accompanied the appearance of sediment.

Mr. SYMES thought, on the whole, the results adduced seemed to show that the volumetric method was reliable, and might even be of value in checking the gravimetric method.

Mr. LLOYD WILLIAMS said in many cases one could not determine a tincture by the volumetric method, because the actual composition of the salts was unknown, and the probable composition varied so much that there was no absolute certainty about the method, and he preferred the gravimetric. In that there was something which could be seen, and was in a state of tolerable purity. In neither case could you determine the absolute quantity of material present, but you could certainly get results which, if the investigator used the same methods, were comparable amongst themselves. In making volumetric determinations of tinctures he had found that extreme difficulty arose in dealing with different samples unless he always standardised against a practically pure salt of known composition, and always kept to it as the standard of comparison.

Mr. CONROY said he had a great admiration for the immense amount of work which the authors must have gone through, and he was very pleased to hear that after going through this stupendous labour they found, on re-examination of the tinctures, that they practically retained their full strength. He would suggest that if on a future occasion the tests were repeated, it would be well to test the deposits also in the case of cinchona and veratrum. They might then be able to say definitely whether the deficiency was due to decomposition or dissipation.

Mr. GERRARD was very pleased to find that the tinctures maintained their character so well, as it would tend to give the medical profession confidence in prescribing them. In many cases they possessed advantages over the pure alkaloidal preparations, in that they contained the constituents of the drug in the natural state of combination. With regard to the comparative merits of the gravimetric and volumetric methods, he was rather in favour of the latter, for this reason: In working, as the authors had done, on a small quantity of material, taking 25 or 50 Cc. of tincture and evaporating to an extract, it required very careful work indeed to deal accurately with such a small quantity. He knew, from some amount of experience, what difficulties occurred in getting the pure residue to titrate from, and unless they titrated the residue side by side with the pure base, as suggested by Mr. Williams, he felt sure they would include in the residue some foreign bodies. It was not easy to get an absolutely pure residue from such small quantities, and if it contained a little resinous or changed matter of some description, and you dissolved it in a solvent, treated it with an acid, and neutralised it, what you neutralised was only the alkali, and what you weighed might be something other than the base. He would ask the authors whether they weighed or measured the tincture previously to the examination, because the difference in the two processes might account for slight differences in the results. They had spoken of the different figures obtained in the case of gelsemine to those obtained by himself, but he thought that might be fairly accounted for by the fact that they were working with small quantities, whilst he worked with as much as $\frac{1}{2}$ cwt. of material, and even then he found it exceedingly difficult to obtain the alkaloid in a pure white condition. He could easily imagine that with the small quantities they used there would be a difference in the figures.

The PRESIDENT said he should like to emphasise what had been said as to the gratitude they all owed to Messrs. Farr and Wright for their work, especially as it was work which did not appeal to everybody, for

it required great patience and determination to go on making experiment after experiment without obtaining any brilliant results. The first paper on the stability of alkaloidal tinctures was very valuable; but with regard to the second one, he did not think the results of the experiments altogether warranted the strong condemnation of the volumetric method of determination for cinchona. In the first case the alkaloid by the gravimetric method gave .074, and by the other method .144 and .145; in the second experiment the weight by the gravimetric method was .087, and by the same reagents .087 and .086, so that it looked as if there were something wrong somewhere. In the first experiment the result by the volumetric method was nearly double, and in the other they were nearly identical. That could hardly be taken as a conclusive experiment. He agreed with Mr. Groves that it was not easy to fix the clinical value of a tincture by the amount of one alkaloid present. He was not quite sure that they could be perfectly certain of having that alkaloid in a pure form, or that they always knew which was the important one. In the case of the aconitine products there was a difficulty in knowing exactly what you had, and in the case of gelsemine the authors themselves said there was a considerable difficulty in this matter. But this did not detract from the value of the investigation as far as it went.

Mr. WRIGHT, in reply, said he quite agreed that it was impossible to ascertain the exact clinical value of a tincture by determining the alkaloids it contained; all they contended for was that if you knew the exact amount of alkaloid it would yield, and fixed a minimum standard of alkaloid for it, there was a far better guarantee for the clinical value than under the haphazard method of making tinctures which had been followed up to the present time. With regard to the comparative value of gravimetric and volumetric processes for the determination of alkaloids and alkaloidal residues, he was inclined to agree with Mr. Gerrard, especially in the case of gelsemine. In the case of several tinctures they employed the same method, and got some very peculiar results, first of all an alkaloid which had exactly the saturate base of Mr. Gerrard's gelsemine, and on adding chloroform after exhausting the tincture with ether they got a further quantity which had a saturating power considerably in excess of that obtained by using ether. That went to prove that there were two separate alkaloids in gelsemium, one having the molecular form stated by Gerrard, and another having a lower molecular weight. This was a subject which required further investigation, and he had, in fact, commenced upon it. Mr. Martindale suggested the use of acetic acid in making tincture of conium to fix the alkaloid, but in conium the alkaloid was already fixed. In fact, in his own opinion, this was one of the most stable tinctures, although the alkaloid was said to be volatile. He believed it existed in combination with some organic acid. The tinctures were not kept in any special way; some were in full bottles, some partially so, many in the laboratory, some in the cellar—no special precautions were taken. With regard to colchicum wine they had made no special investigation, but he recently ascertained for a medical man that the tincture of colchicum was slightly stronger than the wine, and contained rather more of the active principle; probably the tannin in the wine fixed some of the alkaloid. With regard to Mr. Moss's remark on the subject of the diagrams last year, he was glad to find that they produced more impression on friends at a distance than they appeared to do on those present. Generally speaking the tinctures were pure and bright; in the case of cinchona and veratrum there was a deposit, and no doubt the slight loss of alkaloid in those cases was due to the fact that some was

carried out of solution by the depositing matter. He was inclined on the whole to maintain that the gravimetric process was more reliable than the volumetric, with this caution, that there was, in one or two cases, the greatest difficulty in getting rid of the last trace of resinous matter. In the case of gelsemium there was some colouring matter present which they had to devise a special process for getting rid of; it was certainly not an acid resin, and there were two other tinctures in which the same difficulty occurred. In veratrum the resinous matter clung most persistently to the alkaloid, and if further work showed that the volumetric method was reliable in this case, he should admit that it had the advantage. The same with regard to lobelia; the alkaloid there was combined in some very peculiar manner with some other substance, and it was very difficult to get the alkaloid. The advantage of the gravimetric method was that when you saw a substance you knew you had it, but, on the other hand, when you weighed, you weighed everything you had, and if there were any foreign matter present that was included. They had condemned the volumetric method for cinchona because they obtained results just double those obtained in the other way.

(To be continued.)

Parliamentary and Law Proceedings.

PROCEEDINGS IN THE COURT OF CHANCERY.

REVOCATION OF A PATENT FOR A MEDICINAL PREPARATION.

In the Chancery Division of the High Court of Justice, on Tuesday, August 7, Mr. Justice North heard a petition presented by the Pharmaceutical Society for the revocation of Patent No. 20,062, A.D. 1893, the "complete specification" of which is as follows:—

Complete Specification.

An Improved Medicinal Preparation for the Cure of Indigestion and like Complaints.

I, Elizabeth Vaisey, of Thames Villa, Shillingford, Wallingford, in the County of Berkshire, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an improved medicinal preparation for the cure of indigestion and like complaints, and consists, for example, for a two ounce bottle, as follows:—

Diluted prussic acid	½ drachm.
Bicarbonate of potash	1 drachm.
Compound tincture of lavender ...	2 drachms.
Distilled water, add to make up...	2 ounces.

These should be well mixed together, and two tea spoonfuls of the preparation taken in water.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

A medicinal preparation consisting of the above mentioned ingredients combined in or about the proportion stated.

Dated this 24th day of October, 1893.

Mr. R. Wallace appeared for the petitioners, and said: If your Lordship pleases, this is a petition for the revocation of Letters Patent, presented under the 26th section of the Patent Designs and Trade Marks Act, 1883. The leave of the Attorney-General has been obtained for the presentation of the petition. The Pharmaceutical Society of Great Britain are the petitioners.

Mr. Justice North: Wait a moment. I do not quite understand how you come under the 26th section. It says it may be presented—

Mr. Wallace: By the following persons, by the Attorney-General in England and Ireland, or by the Lord Advocate in Scotland—

Mr. Justice North: Or by any person authorised by the Attorney-General in England or Ireland.

Mr. Wallace: We are authorised by the Attorney-General to present the petition. I appear for the Pharmaceutical Society of Great Britain. That is a society incorporated by Royal Charter and by Act of Parliament, 15 and 16 Vict., cap. 56. Its object is the protection of chemists and druggists by the Act, and by an Act of 1868 it was also entrusted with certain duties to protect the public with regard to the sale of poisons. Now, my Lord, section 16 of the Pharmacy Act says that nothing hereinbefore contained shall interfere with the business of any legally qualified apothecary or any member of the Royal College of Veterinary Surgeons, nor with the making and dealing in patent medicines; and it is because of that section that we come before your Lordship, and because of a decision in the First Queen's Bench Division, 1893, p. 686, the case being the Pharmaceutical Society v. Piper.

Mr. Justice North: You have not told me what you want to do. To revoke a patent granted to whom?

Mr. Wallace: A patent has been granted to Elizabeth Vaisey for a poison, because of this decision, under which it was held that the Pharmaceutical Society had not power to restrain the sale of poisons when a patent had been granted. That was under the section I have just read. The consequence was, patents were taken out for all kinds of things so as to prevent the Pharmaceutical Society protecting the public under the Act of Parliament. A great many invalid patents have been taken out. This is about the fifth or sixth I have applied to revoke under the same conditions, and the respondent has never appeared to the petition.

Mr. Justice North: What case is it you refer to?

Mr. Wallace: The Pharmaceutical Society v. Piper. That was the case of a preparation which contained morphine and other poisons.

Mr. Justice North: It is not lawful to retail or dispense poisons unless the man is a pharmaceutical chemist or a chemist and druggist under the Act?

Mr. Wallace: Yes, my Lord. Then the head-note to that case says "That the prohibition in the Act against the sale of poisons by other than registered chemists was not confined to the sale of scheduled poisons in their simple state, or of the preparations of such poisons, but extended to the sale of a compound containing a scheduled poison as one of its ingredients; and further, that the exception in section 16 in favour of patent medicines extended only to medicines which were the subject of Letters Patent, and not to proprietary medicines." The Society cannot protect the public as long as Letters Patent have been granted; that takes the vendor of the medicine out of the Act. They take out these worthless patents with the object of preventing the Pharmaceutical Society proceeding against them, under their Charter and under the Act. This patent is No. 20,062 of 1893, and is for an improved medicinal preparation for the cure of indigestion and like complaints, and it says "The invention relates to an improved medicinal pre-

paration," and so on, "and consists, for example, for a 2oz. bottle as follows:—Diluted prussic acid, $\frac{1}{2}$ drachm; bicarbonate of potash, 1 drachm; compound tincture of lavender, 2 drachms; distilled water, add to make up 2 oz." So that, my Lord, there is a large amount of prussic acid in this. That is the complete specification filed. There is nothing in this to show the exact quantities, and when I tell your Lordship that there are about ten or twelve different standards of prussic acid, and that one drachm is sufficient to poison an individual, it is quite evident, without any evidence, that this patent is taken out merely for the purpose of evading the Act. There is no sufficient description, and it is quite evident that this is merely to protect the sale of poison by the patentee, and to evade the Act and this decision. My Lord, I have here a book containing the various strengths of prussic acid, and nothing is said in the patent as to which of these is to be used, and no directions are given.

Mr. Justice North: It does not say how much it is to be diluted.

Mr. Wallace: No, my Lord; that is the point. The different strengths are—the British Pharmacopoeia, 2 per cent.; in France, 10 per cent.; in Vancoulin's, 3.33 per cent.; in Scheele's, 4.45 per cent.; in River's acid, 10 per cent.; in Robiquet's, 50 per cent.; in Schrader's, 1.5 per cent.; and there are various other acids to choose from. Of course, particulars of objection have been presented, but the grounds that I put before your Lordship are the two grounds above mentioned, that there is no sufficient description of the invention, and that it is manifest this is taken out with the object of defeating the powers of the Pharmaceutical Society. The petition has been served personally.

Mr. Justice North: I do not quite see that your last objection is a good one.

Mr. Wallace: Which one, my Lord?

Mr. Justice North: The object with which it is taken out. It may be quite a legitimate object.

Mr. Wallace: Well, my Lord, if the patent were a good patent, and you could show that there was invention in it, and that it was a new cure, of course Letters Patent might be granted.

Mr. Justice North: You were putting two grounds, Mr. Wallace. Your first was a good one, that the patent is bad; but your second, that it was taken out to prevent the powers of the Pharmaceutical Society applying to it, may be a perfectly legitimate one.

Mr. Wallace: Yes, my Lord, provided it was a good patent.

Mr. Justice North: I mean you are putting it as a second ground, and as a second ground it does not seem to me to be well founded.

Mr. Wallace: Of course that is only a presumption on my part. That is a thing, of course, which I could not prove; it is only because so many others have done it.

Mr. Justice North: You say it is insufficient in the directions?

Mr. Wallace: Yes; and that there is no invention in the use of prussic acid, which everybody uses, which is a well-known drug for that purpose.

Mr. Justice North: I do not think that is enough either. You may have an entirely new compound made up of old drugs.

Mr. Wallace: Yes, my Lord, but then there is no new compound here. You are only directed to mix prussic acid with a base and with tincture of lavender; the tincture of lavender only being for scent. There is not anything new in the patent.

Mr. Justice North: That may be; but you put it that the use of prussic acid is not new. That would not be enough.

Mr. Wallace: If there were some new compound

made, of course that new compound would be subject matter for a patent, but here the bicarbonate of potash is only the base for holding the prussic acid, and the tincture of lavender is a well-known flavouring mixture, and then there is only distilled water besides. Practically it is for prussic acid pure and simple, which is a well-known drug, and is prescribed by physicians. Now, my Lord, the petition recites the facts I have told your Lordship, but we have no affidavit verifying it, because we were not able to find the President of the Pharmaceutical Society on Saturday, but we will verify the petition.

Mr. Justice North: Is he the only person competent to verify it?

Mr. Wallace: He has gone into the whole matter, and he made the declaration which was before the Attorney-General. In fact, my Lord, all we have to do is to make the declaration into an affidavit. The Patent Office official is here with the declaration which was before the Attorney-General. We did not know until yesterday that the revocation would be consented to, but no one is here to consent.

Mr. Justice North: Well, let us go on with the petition.

Mr. Wallace: Well, my Lord, the petition recites the facts as to the Charter being granted and so on, and then it recites what the patent is for, and the claim, and in the fourth paragraph it says, "The use of diluted prussic acid—"

Mr. Justice North: I was looking at the sixth paragraph.

Mr. Wallace: Yes, my Lord. "The said Elizabeth Vaisey has failed in the said specification to declare the nature of her invention, and has not stated sufficiently the proportion of the various ingredients set out in the complete specification which it is necessary to use in order to carry out her alleged invention. It is stated in the said specification that one of the component parts is diluted prussic acid, but no direction is given as to the strength of the prussic acid which is to be used. In the claim the words 'Combined in or about the proportion stated' appear. Your petitioners submit that the statements are vague and misleading, and impose upon persons who may desire to use the said invention the necessity of ascertaining by trial and experiment what is the proper strength of prussic acid to be employed, and, further, to ascertain by trial and experiment what is the exact proportion of the various compounds to be used. For the above and other reasons your petitioners submit that the alleged invention claimed is one for which Letters Patent ought not to have been granted." Then it recites the facts I have been telling you as to the case of Piper, and prays that the patent may be revoked. Particulars of objection have been presented in accordance with the Act.

Mr. Justice North: If you have not the evidence, all I can do is to order it to stand over until you have. No one appears for the respondent?

Mr. Wallace: No, my Lord. We have an affidavit of service. We wish to save these people as much expense as possible, and, in fact, to save expense on each side. Her only statement when she was served with the petition was that she had used it for twenty years. That, of course, would not be any ground. We will file the affidavit, my Lord, in the same form we have it here. Subject to filing the affidavit verifying the petition, if your Lordship would grant the revocation of the patent I think it would save expense to both the Pharmaceutical Society and the respondent. It is quite evident that the patent is not one which it is wished to defend. On one occasion before, my Lord, it was allowed to stand over to go into the witness list, and it caused a great deal more expense.

Mr. Justice North: I did not propose it should go into the witness list.

Mr. Wallace: Subject to filing an affidavit verifying the petition, will your Lordship allow the patent to be revoked?

Mr. Justice North: Yes. But I think it must be in the paper to be disposed of after the affidavit is filed. You see the respondent does not appear. The office copy affidavit ought to be produced now.

Mr. Wallace: We could get it done to-day, I believe, and I could mention it again.

Mr. Justice North: It may be at the head of the paper on Thursday, if you like, at the sitting of the Court. Then the order may be made without anything further being done, excepting your telling me you have the affidavit.

On Thursday, August 9,

Mr. R. Wallace, in answer to his Lordship, said he had now an affidavit verifying the statements in the petition.

Mr. Justice North: Then the order may go, to be dated to-day.

Dispensing Memoranda.

(Continued from Vol. XLI., p. 1047).

[649] The following prescription was recently sent to a pharmacy by a customer who complained that she could not get it uniformly dispensed where she was staying:—

R	Bismuthi carb.	℥i.
	Tinct. calumb.	℥iil.
	Spirit. chlorof.	℥iiss.
	Sod. bibor.	gr. xl.
	Mucil. tragac.	℥iv.
	Aq. ad.	℥vi.

M. Sumat ℥i. ter in die post cibos.

[650.] As illustrating how confusion may be caused by inaccuracy in copying, the following French prescription seems worthy of publication:—

Sulfate de quinine	7 grammes.
Bi-Carbonate de Soude.....	7 grammes.
Poudre de Douver	7 grammes.

Melez de divide. On prendre trois par jour avant les repas.

Several words are misspelt, the word "grammes" in two different ways. The figure "7," as written, is in each case crossed by a horizontal line, as is commonly done in France and Germany.

Answers to Correspondents, etc.

H. Lucas.—1. *Lysimachia vulgaris*; 2. *Erythraea castrum*.

Edward A. Burgess.—Kindly send popular name in printed characters, as it is difficult to decipher in writing. Can you also send a leaf of the plant?

"*Trifolium*."—It is *Trifolium fragiferum*.

Books, etc., received.

GUY'S HOSPITAL REPORTS. Edited by W. HALL WHITE, M.D., and W. H. A. JACOBSON, M.A., M.Ch. Vol. I. Pp. i.-xl., 1 to 738. 10s. 6d. London: J. and A. Churchill. From the Hospital.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Campbell, Hogg, Ingham, McDermont, Naylor, Thompson.

Blaud's Pills.

BY JOSEPH INCE.

Dr. Blaud, the inventor of this preparation, was Head Physician of the Hospital of Beaucaire, Gard, and corresponding member of the French Academy of Medicine. The original formula was much lauded in contemporary journalism, and was specially commended by M^{érat} and de Lens, as well as by M. Bouchardat.

According to Auguste Blaud, nephew and successor, the formula, which was not a secret remedy, was first given in 1831, and was inserted in the *Nouveau Codex Français*, p. 555, formula 612, date 1866, and has since that time up to the present been prepared in exact accordance with the directions which are here translated.

Blaud's Ferruginous Pills.

Sulphate of protoxide of iron, purified, dried and powdered, thirty grammes	80
Carbonate of potassium, pure, dried, thirty grammes	80
Gum arabic in powder, five grammes	5
Water, thirty grammes	30
Simple syrup, fifteen grammes	15

Dissolve the gum in a porcelain capsule, by the heat of a water-bath, in the quantity of water prescribed; add the syrup and the sulphate of iron; stir for some moments in order to render the mixture homogeneous; add the carbonate of potassium previously powdered, constantly stirring with an iron spatula, and continue heating until the mass has acquired a pilular consistence, rather more hard than soft. Withdraw from the source of heat and divide the mass into 120 pills, which must be dried in the stove (drying closet) and silvered. Put the pills into well-corked bottles: each pill weighs about 40 centigrammes.

The pills as so made have a very attractive appearance, the name Blaud being stamped on each. Judging by a sample forwarded by Auguste Blaud, February 16, 1892, the shape is permanently retained, and the ferrous salt is in an unchanged condition.

A vigorous protest appeared in the *Journal de Médecine de Paris* (Nov. 15, 1891) against the idea that novelty is to supersede older and tried remedies, and it was pointed out that at least as regards ferruginous preparations we may be content to abide with those already sanctioned by authority and by experience.

The illustration drawn from the *Codex formula* of these "pilules ferrugineuses" was viewed with satisfaction by the pharmacy at Beaucaire.

Variations have been constantly attempted, with more or less success, in the manufacture of a pill that shall contain a non-oxidised carbonate of iron. The *Pilula Ferri* of the *British Pharmacopoeia* seems to leave nothing to desire; the mass is readily made, and the pills keep their shape. The formula is based upon the judicious use of glycerin, which is undoubtedly a desirable introduction. Other antecedent formulæ have been constructed on a similar principle, and with equal advantage. It is just to the original inventor to state, that while these adaptations of the *Codex* form may be recommended as effective remedies, they do not yield a more permanent product than the original.

The Asafœtida Plants.

BY E. M. HOLMES, F.L.S.,

Curator of the Museums of the Pharmaceutical Society of Great Britain.

Up to the present time several plants yielding a milky juice, having the odour of asafœtida, have been discovered in various countries, extending from Turkestan and Kashmir to the north-west of Persia; but, with the exception of Kämpfer, who in 1687 observed its collection in the neighbourhood of Diagun, in the province of Laristan, of Bellew, who witnessed the collection of an asafœtida in the neighbourhood of Candahar in 1857, and of Wood, who, in his journey to the source of the Oxus, found it to be produced in the mountains around Saigan, no one has actually seen the drug collected, and in neither case has the plant yielding it been identified with absolute certainty. It seems, however, that it may be possible by a process of elimination to ascertain which of the plants do not yield the commercial article, and that thus the plants which actually do yield it may be determined.

Dr. J. E. T. Aitchison, C.I.E., F.R.S., who hopes to determine the source of several of the fetid gum resins concerning which much uncertainty still prevails, has just forwarded his first contribution towards that end. In a letter received from him, from Kashmir, he says that he has come upon *Ferula Narthex*, Boiss., at the very locality, he believes, where Falconer originally found the plant in 1838, since which time no one has found it, so far as he is aware. This is the plant that has twice flowered at Edinburgh, and once at Kew, and is still in cultivation in various botanic gardens. It was noticed by Mr. W. R. Laurence, F.C.S., C.I.E., on his official tour through Jammu and Kashmir in 1893, when it was in flower, between Astor and twenty miles north, near Doian. Dr. Aitchison has obtained, through this gentleman, roots and stems with the remains of leaves and flowers, in very bad condition so far as botanical specimens go, but sufficient for the identification of the species. He states that "the people at Astor do not in any way collect the gum resin asafœtida, but people passing through Astor on the road from Kashmir to Gilgit collect the leaves and young flowering shoots and employ them in place of other vegetables. Those who use them are usually Hazaras or Afghans; they of course consider this to be the plant of their own country (*F. fetida*, Regel) from which the commercial product of their country is produced. As far as Laurence knows, and from all the information I have heretofore been able to collect, no asafœtida of any sort is collected anywhere in Kashmir territory, and any that may possibly pass through Kashmir to India must be collected somewhere in Afghanistan proper, and come into Kashmir *via* the western and northern routes."

Dr. Aitchison has also been able to clear up another doubtful point. In the 'Flora of British India' (vol. ii., p. 708) *Ferula fetidissima*, Regel, is given as a synonym of *Ferula Jaeschkeana*, Vatke. Some years ago (*Pharm. Journ.* [3], xix., p. 44) I pointed out that although the two plants are as like each other in foliage as are *Ferula fetida* and *Dorema ammoniacum*, yet that *F. Jaeschkeana*, Vatke, at all events in the dried state, had not the slightest odour of asafœtida, and could not possibly be iden-

tical with *Ferula fatidissima*, Regel. Dr. Aitchison now writes that *Ferula Jaeschkeana* is plentiful all around Gulmerg (8600 feet) near Srinuggur, in Kashmir, and that "anyone who had ever seen the plant in a living state and examined its milky juice, would never for a moment consider that asafoetida or any alliaceous gum resin could be obtained from it. The juice is strongly celery-scented and pleasant to a European's sense of odours, and in no way resembles that of the asafoetida-producing *Ferulas*. From Jaeschkes' oral description to me of the nauseous odour of one of his Umbelliferae I still expect someone to find an asafoetida-producing *Ferula* in Lahul."

It is therefore evident that although there may be a number of plants capable of yielding an asafoetida, the drug is only collected in certain localities, and not from all the species capable of yielding it.

PREPARING TEETH FOR MICROSCOPIC STUDY.

BY W. E. CHRISTENSEN, D.D.S.

When the tooth has been extracted, it must immediately be brought into some conserving fluid—as alcohol or watery solution of bichloride of mercury—to prevent the pulp from shrinking. Also, in all further manipulations, as cutting, sawing, or grinding the sections, careful attention must be given that the tooth or section is at no moment without an excess of moisture. If teeth of rabbits or dogs are used, it must be remembered that the tissues of the pulp stick more to the wall of the pulp-chamber than in human teeth. This is important at the first opening of the tooth. If human teeth are taken from dead bodies, it must not be more than six hours after death.

In order to enable the preparing drugs to enter the pulp, it is necessary to open the tooth and partially expose the pulp in such a manner that the pulp is not hurt. For this purpose we make a section with a sharp, fine saw on both sides of the tooth about midway of the crown, and cut off the part with a pair of strong excising or splitting forceps. The end of the pulp will then be exposed without being hurt. At the apex of the root a short piece is cut off in a similar way. For fixation of the tissues, the tooth is placed in a saturated solution of bichloride of mercury in water for about eight to twelve hours, after which it is washed in running water for two hours.

To harden the tissues of the pulp, the tooth is then placed in alcohol of low degree, the strength of which must be gradually increased from 30 to 50 per cent., and from 50 to 70 per cent., leaving the tooth from eight to twelve hours in each of the three stages. From the bichloride of mercury there will be left a black precipitate on the specimens which can now be removed by placing them for about twelve hours in 90 per cent. alcohol, to which $1\frac{1}{2}$ to 2 per cent. tincture of iodine has been added. The iodine is removed by placing the specimens in pure alcohol until they recover their former white appearance. After the process of hardening in alcohol, the teeth can be cut in two or three sections by means of a fine, sharp scroll-saw. The next step is to stain the specimens. There are a

great number of dyes used for staining preparations for microscopic studies. Dr. Weil, in the description of his method, mentions a great many, but he says he has obtained the best results with "aqueous borax-carminc," prepared in the following manner:—

Eight grammes of borax is powdered in a mortar together with 2 grammes of carmine, and then mixed with 130 grammes of aq. dest. After twenty-four hours the solution must be well filtered, and is then ready for use.

The sections, when taken from alcohol, are washed in running water for about fifteen minutes, and then transmitted to the dye for twelve to twenty hours, in which time they will become intensely coloured. The excess of dye is removed by placing the sections in 70 per cent. alcohol, to which 1 gramme of hydrochloric acid has been added to each 100 C.cm. for as long as they have been in the dye. It is then well to place them in 90 per cent. alcohol for about twelve hours, and afterwards in oil of cloves for one or two hours. This last procedure makes the specimens more transparent.

We have now come to the treatment with Canada balsam. This must in the meantime have been prepared in the following manner: A quantity of Canada balsam, as obtained from the druggist, is placed in an evaporating dish, and kept over boiling water until the balsam, by cooling, becomes solid and brittle like glass. This takes from twenty to thirty hours, according to the quality of the balsam.

When the sections are taken from the oil, they must be cleaned with pure xylol, and then quickly immersed in chloroform, to remain twenty-four hours. Then sufficient of the hardened Canada balsam is added to the chloroform to give a weak solution, and after another twenty-four hours the solution must be saturated with Canada balsam; but the solution containing the specimens is then again put into an evaporating dish, and placed over hot water until the balsam once more becomes solid. As the chloroform boils at a low temperature (60–61° C.), the heat from the water must, to begin with, not be higher than about 60° C.; later it can be increased, but altogether slowness of the solidifying process is in favour of the results. Consequently, the procedure takes from twenty to thirty hours.

When the balsam, by cooling, becomes solid and brittle, the specimens can be cut out with a small, sharp chisel, and with a fine, sharp scroll-saw be cut into sections suitable for grinding. The grinding is done as when small sections of bone are ground for microscopic study, always under application of excess of water. The pressure must be very gentle, especially when the specimen gets thin; the result now depends somewhat upon the skilfulness of the operator. When the section is thin enough, which must be controlled under the microscope, it must be carefully cleaned in distilled water, and finally mounted in Canada balsam.

This whole procedure may at first seem rather complicated, but the results certainly repay the labour.—*The Dental Cosmos*, through *British Journal of Dental Science*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

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Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STREET BROTHERS."

ORDO RERUM.

THE calling of a pharmacist is not one that can be tied up by hard and fast rules. The exigencies of the work are such that he must in case of need and pressure depend on the loyal help of his employes of every rank—that of his fully qualified "Major" or pharmaceutical chemist, as well as of his errand boy. His hours of labour cannot be regulated by any eight or ten hours' bill. He must be at the beck of the public whenever pain, suffering, and disease make their urgent call. So that however much he may desire to enjoy a little well-earned leisure, the pharmacist can never feel certain that this will not be disturbed by the night bell. In establishments where relays of qualified assistants alternately work the early and late duties of attendance, the labour and strain of nervous tension is less irksome, if it be more intense while it lasts, so that—in those especially where both qualified assistants and juniors are employed—a certain amount of regularity can and must be maintained, as regards hours of labour and the details of the work to be done. Much, therefore, of both these conditions becomes a matter of routine. On the whole, the pharmacist's work possesses the charm of variety, but unless the daily routine of it becomes constituted into rules, written or unwritten, a pharmacy would lack that first law of heaven—order. To rule properly, therefore, in many cases means that these regulations must be compiled in a formal manner and issued with the authority of the proprietor, in fact, that an *ordo rerum* must exist, as of old, embodying the ripe judgment of those who have gone before. Some have found it necessary to commit their "wise words" to print, and we have no doubt the well-lubricated card is to be found in many establishments at the present time. We have three such before us at the present time. In "The Rules, etc.," compiled by a revered father in pharmacy, besides the "Rules for the House" we have others bear-

ing on promptitude, attention, order, accuracy, safety, neatness, delivery, interference, and success in business. The delicate ethical relations between the prescriber and the pharmacist are carefully noted, and it is discreetly directed how they are to be treated. Another *ordo rerum* gives a number of "Hints and Suggestions to Assistants" on dispensing, and it has printed in red ink on the face of it the following in regard to the "Sale of Poisons":—

"Assistants must have a perfect knowledge of the Poison Schedule of the Pharmacy Act, 1868, and they must carry out the regulations of that Act in every detail. A copy of the Schedule is displayed in the Pharmacy for reference, so that no plea of ignorance of its contents will be admitted."

The third appeared in the *American Druggist*, and has been re-published by a contemporary in this country. It is not adapted to English pharmacy, as it would destroy the good feeling between employer and employed which exists to a greater extent with us than appears to be the case across the Atlantic (a system of fines forms part of it, and the employes are "to embrace every suitable opportunity to recommend our own specialities, and to sell as many of them as possible"). The qualified assistant with us is now a responsible agent, one who must use his discretion and knowledge in the interests of the purchaser as well as of his employer. He must sell or not sell as his judgment directs, if he considers the purchaser is not a proper person to be entrusted with what he demands, be it morphine or opium, or a nostrum containing these in disguise.

In directing the ways of a pharmacy, especially in regard to the manner of conducting the sale of poisons, we are of opinion that much may be done by judicious rules, and by frequent attention being drawn to them. They will not, of course, replace the necessary personal admonition and supervision by the principal, any more than would the written prayers presented to Jove replace the invocation, if the god were merely addressed "Oh! Jupiter, these are my sentiments," and the supplicant then went to sleep. Still, rules, especially in regard to the sale of poisons, will help to maintain order in a well-regulated pharmacy. They will not, of course, exonerate the principal from the neglect of duty on the part of an employe in conducting a sale of poison, but they will tend to extenuate the offence. In framing rules the principal of a pharmacy must not be a martinet. Much is best unwritten, else the finely balanced relations of employer and employe are lost. But by carefully directing, in outline, how cases are to be treated as they arise, he will do much to help his employe to act when left to his own resources. Each establishment needs to draw up its own regulations, as no two are exactly alike in every respect.

THE NOSTRUM TRADE.

A MEDICAL correspondent writes to point out, as complementing and corroborating the tenour of the article on this subject which appeared in our issue of July 28 (see p. 75), an article appearing in the *British Medical Journal* of the same date, under the heading, "The Spirit of Quackery within the Pale of the Profession," by Dr. J. WEST WALKER. In illustration of this he quotes the following passage:—

"When I send to a consultant I invariably ask myself what novelty shall I have to procure, and this, notwithstanding it is the rule to have my surgery well supplied with most of the established therapeutic agents. The recently-born mineral water or proprietary dietetic, the endless variety of the carbon derivatives with their break-jaw names, the latest importation from America, some form of course of antiseptic, the newest tabloid, capsule, or cachet, some drug, it may be, not to be found in the Pharmacopœia nor the usual trade lists, but only to be obtained from a particular chemist; these and such like form a tempting catalogue of choice novelties from which selection may be made according to fancy."

We are glad to find that the inconvenience of the employment of the latest pharmaceutical novelties is felt not only by dispensing chemists, but also by medical practitioners.

UNVEILING A STATUE OF SYDENHAM.

AN interesting ceremony took place at Oxford on Thursday, August 9, when the Chancellor of the University, the Marquis of SALISBURY, K.G., attended at the University Museum for the purpose of accepting, on behalf of the University, a statue of THOMAS SYDENHAM, presented by the Warden and two Fellows of All Souls' College. There was a large and distinguished gathering, and Lord SALISBURY was asked to accept the statue by Sir HENRY ACLAND, Regius Professor of Medicine in the University, who referred to the fact that SYDENHAM was a Fellow of All Souls' for several years in the troublous period of the Commonwealth, and pointed out that the statue was placed between those of HUNTER and HARVEY, who with SYDENHAM built on the foundation prepared by ARISTOTLE and HIPPOCRATES—two of the most marvellous men of their time. Like his great contemporaries—BOYLE, NEWTON, and LOCKE—SYDENHAM was an observer and interpreter of Nature, observing fact under every condition of being and change, and interpreting as far as the knowledge and means available made interpretation possible. This method of observation and experiment was now accepted as the only basis of therapeutics.

The Marquis of SALISBURY, in accepting the statue, said, on behalf of the University of Oxford, that he accepted with great pleasure and gratification the splendid present made by Sir HENRY ACLAND and the Warden and another member of All Souls'

College. Perhaps it was to the blame of their college that they had not before made this gift to the University of Oxford. But it had fallen now, he thought, on a happy time that they should be able to present it, because it formed the completion of the figures of these ancestors of medical science, which, like the old Romans, they placed in the entrance of that palace of science; and it came at a time when they were able to see how great had been the growth of the cultivation and renewal of the study of Nature of which this splendid Museum had been the out come and was the seed. Perhaps at an earlier time they should not have appreciated how much had been done in that respect, and perhaps they should not have felt as they felt now how thoroughly appropriate it was that the great masters and heroes of medical science should be conspicuous ornaments of that Museum. For the Museum marked the growth of the new study, and it had arisen chiefly by the efforts and under the authority of Sir HENRY ACLAND, the great representative of medical science at that University, and in honouring SYDENHAM, as they did, they were honouring his great successor, to whom, more than to any other man, the renewal of the study of Nature in the University was due, and to whose efforts and to whose memory that splendid building and the more splendid incorporal construction in which it was built would be a lasting and brilliant testimony.

NEW CONSTITUENT OF THE ATMOSPHERE.

At the meeting of the chemistry section of the British Association on Monday last, the discovery of a new gas in the atmosphere was announced by Lord RAYLEIGH and Professor RAMSAY. Whilst working upon the density of gases Lord RAYLEIGH found that the density of nitrogen obtained from the atmosphere was greater by about half per cent. than that of the same gas obtained from other sources. Professor RAMSAY took up the investigation, and it was found that, on passing electric sparks through air and absorbing the resulting nitrous fumes, a residue remained, the spectrum of which differed from those of oxygen or nitrogen, having a single blue line much more intense than the corresponding line in the nitrogen spectrum. The gas may also be isolated by exposing atmospheric nitrogen to the action of magnesium. As the magnesium gradually absorbs the nitrogen, the density of the residue rises to nearly 20. Professor EMERSON REYNOLDS suggested that if the new substance proved to be an element it would occupy a place in MENDELÉEFF's table among the platinum metals. It appears probable, however, that it is simply an allotropic modification of nitrogen, which it resembles in its extreme inertness. The gas constitutes about 1 per cent. of the atmosphere, and about 100 C.c. of it has so far been isolated.

PHARMACEUTICAL EDUCATION.

In the Journal for September 16, 1893, particulars were published of classes and courses of laboratory instruction, suitable for pharmaceutical students, at various institutions throughout the country. The information then given having been found useful, it is proposed in an early issue of the Journal to bring it up to date and supplement it by other matter of special interest to students. It is requested, therefore, that divisional and local secretaries and secretaries of local pharmaceutical associations will assist the Editor by forwarding as early as possible detailed information of any suitable classes, etc., in their respective districts—in botany, chemistry, materia medica, pharmacy, and physics.

UNIVERSITY OF LONDON.

THERE now seems to be a better prospect of a satisfactory agreement being arrived at in connection with the proposed reconstitution of the University of London as a teaching as well as an examining body, for at the last meeting of the Senate of the University it was resolved as follows:—

"That it is desirable to memorialise Government to take immediate steps for the appointment of a statutory commission to frame statutes in general accordance with the report of the Gresham Commission, but with power to make such modifications as may seem to them expedient after considering any representations made to them by the Senate, Convocation, or any other bodies affected."

UNIVERSITY DISTINCTIONS.

At the recent examinations of the Durham College of Science, R. R. HALLAWAY, a student of the Pharmaceutical Society and son of Mr. JOHN HALLAWAY, local secretary for Carlisle, passed the first associateship examination and gained the T. Y. HALL scholarship, which is tenable for three years, and is worth, in the aggregate, about thirty-five pounds per annum. Another pharmaceutical student, LEOPOLD D'E. LENFESTY, son of Mr. W. G. LENFESTY, a member of the Pharmaceutical Society, has passed the Intermediate Examination in Science of the University of London; and A. W. SIKES, B.Sc., an associate of the Society, has passed the Intermediate Examination (honours) in Medicine of the same university.

THE SALE OF CARBOLIC ACID.

ACCORDING to the *Sheffield Telegraph*, on August 13, before commencing an inquiry at Bakewell, the coroner (Mr. SYDNEY TAYLOR) said he would like to refer to a matter which occurred at the last inquest. The jury in that case made a strong recommendation that carbolic acid ought to be scheduled as a poison, and he wrote to the Secretary of the Pharmaceutical Society, enclosing him the recommendation of the jury. The Secretary replied that the Council of the Society had three times officially resolved that carbolic acid ought to be scheduled so as to prevent its common sale, but so far the Privy Council had not thought it to signify approval of the suggestion. The coroner added that he had since written to the secretary of the Privy Council, giving him the effect of the jury's recommendation, to which he had only received a formal acknowledgment.

Provincial Transactions.**FEDERATION OF LOCAL PHARMACEUTICAL ASSOCIATIONS.**

A meeting of delegates appointed by the various pharmaceutical associations was held at the Randolph Hotel, Oxford, on Monday, July 30, 1894.

The following associations were represented:—

The Cambridge Pharmaceutical Association, by A. S. Campkin.

Exeter Pharmaceutical Association, by H. W. Gadd. Glasgow and West of Scotland Pharmaceutical Association, by W. L. Currie.

Liverpool Chemists' Association, by Dr. Symes.

London Chemists' Assistants' Association, by E. H. Gane.

Manchester Pharmaceutical Association, by H. Kemp.

Midland Pharmaceutical Association, by C. Thompson.

Nottingham and Notts Chemists' Association, by C. A. Bolton.

Apologies were received from J. F. Eardley, representing the Sheffield Pharmaceutical and Chemical Society; J. Harrison, Sunderland Pharmaceutica Association; J. F. Tocher, Peterhead and District Chemists' Association; and W. H. Gibson, Brighton Association of Pharmacy.

The chair was taken by Mr. W. Gowen Cross, of Shrewsbury, Vice-President of the Pharmaceutical Society, who said he was pleased to give his countenance to a movement having for its object the closer union of pharmacists. He felt sure a federation such as the one now proposed would, under certain conditions which he enumerated, receive the approval of every pharmacist who had the welfare of pharmacy and the Pharmaceutical Society at heart. He then asked the hon. secretary to read the report of the interim committee appointed at Nottingham.

The report showed that a circular letter had been issued to the various associations throughout the country, asking them to appoint delegates to represent them. The replies received were most favourable; but some associations, owing to various causes, had not yet replied. It was a source of regret to the committee that many associations had apparently ceased to exist, as evidenced by the fact that many letters had been returned marked "not to be found."

The committee is of opinion that in every town where there are half a dozen pharmacists an effort should be made to cultivate a closer bond of union by the formation of an association which should be affiliated with the Federation. Only four associations have declined to appoint delegates.

A long and animated discussion took place, in which all the delegates took part. It was agreed that the main object of the Federation was to promote a greater unity. It would not undertake any legal work, as that was already provided for; but it would assist in anything that might arise, having for its object the better protection of trade interests. Finally, it was unanimously agreed that a committee be appointed, consisting of one delegate from each of the associations represented, with instructions to draft a code of rules to be presented at another meeting to be held at a central place a few months hence.

Mr. Harry Kemp, Manchester, was unanimously elected the first President; Mr. W. L. Currie, Glasgow, Vice-President; Mr. Chas. Thompson, Birmingham, Hon. Secretary and Treasurer.

British Pharmaceutical Conference.

MEETING OF THE EXECUTIVE COMMITTEE.

A meeting of the Executive Committee was held at the Randolph Hotel, Oxford, on Monday, July 30, at 6 p.m.

Present:—Mr. N. H. Martin (President), Messrs. Atkins, Groves, Reynolds, Schacht, Martindale, J. H. Mathews, C. Umney, and Prior (Vice-Presidents), Mr. Moss (Treasurer), Messrs. Druce, Gerrard, Bolton, Holmes, Farr and Wright; Mr. H. Mathews (Hon. Local Sec.), Messrs. Naylor and Ransom (Hon. Gen. Secs.), and Mr. Nightingale (Assist. Sec.).

The minutes of the previous meeting were read and confirmed.

The Treasurer's financial statement for the year 1898-94 was read and approved.

A draft report for presentation at the annual meeting was submitted by the Hon. Gen. Secs., and agreed to.

A proposed list of officers for the ensuing year was adopted for recommendation at the general meeting for election.

The draft programme for the proceedings of the sittings of the Conference was laid on the table and approved.

The place of meeting for 1895 was considered, and it was announced that a cordial invitation from Bournemouth would be offered at the general meeting.

By a unanimous vote the Editor of the *Pharmaceutical Journal* was thanked for his liberality in providing members of the Conference and their friends individually with a free copy of a specially indited illustrated handbook of "Oxford and its University."

Six gentlemen, having been duly nominated, were elected to membership.

MEETING AT OXFORD.

(Continued from p. 128).

THE QUALITIES OF A TYPICAL DENTIFRICE.

BY ARTHUR TURNER, F.R.C.S., L.D.S.,

Dental Surgeon to the Bucks County Infirmary.

By a typical dentifrice we mean one adapted to general use, in contradistinction to powders having special properties, prescribed for use in special cases.

In building up our powder, we have first to look for a mechanical base which shall be capable of cleansing the surface of the tooth, without the possibility of doing any chemical or mechanical damage to its structure.

We must bear in mind that the enamel, though the hardest and densest tissue in the body, is not impregnable, and that the edge of the enamel-cap is bevelled off, so to speak, becoming thinner as we approach the gum. At the neck of the tooth there is often no enamel at all, and consequently, whatever dentifrice is used, will here come into contact with a more vulnerable structure—the cementum of the surface of the root. We are here referring to a normal healthy tooth. Let us take care that our mechanical base is of such a nature that its constant use can do no harm to this more delicate part.

Now we contend that the presence of pumice-stone in the base, even if used in small proportion and finely ground, cannot fail to do damage here as well as to the thinner parts of the enamel-cap; the hard angles of its particles scratch the surface of the tissues and wear them away.

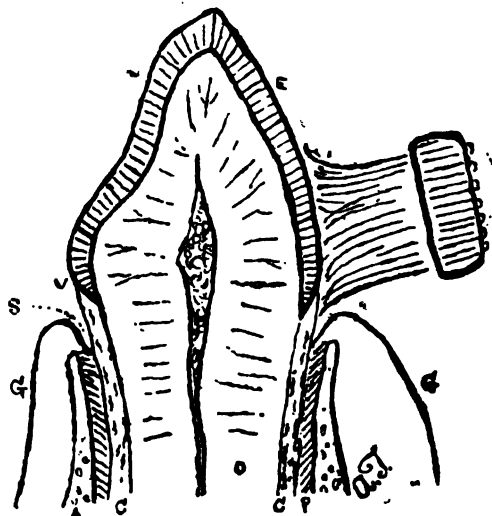
Charcoal, as a base, is objectionable on account of its colour—it is liable to accumulate in the sulcus between the gum and the cementum, forming an unpleasant looking dark line.

We are compelled then, in choosing a base, to fall back upon our old friends, the chalks of the Pharmacopœia. These fulfil as accurately as possible the required duty.

We really clean our teeth then just as we do our silver and plated goods; we have not yet found a better way. Indeed, to test the quality of our mechanical base we might do worse than to clean a new silver spoon with it, and then with the aid of a lens examine the surface of the silver to see whether it has been out. If it has suffered injury, let us by all means try to find a softer base.

To follow out the plate-cleaning idea one might, after cleaning the fronts of the incisors, give them a final dry polish with wash-leather.

On comparing the claims of the official chalks, we much prefer the *creta præparata* to the *creta præcipitata*, for every particle of the former has been suspended



Section of Crown of a Sound Canine Tooth and adjacent structures, with soft tooth-brush applied:—E, Enamel cap; C, Cementum; D, Dentine; P, Alveolo-Dental Periosteum; A, Alveolar Bone; G, Gum; V, Specially vulnerable part even in a healthy tooth; S, Sulcus between gum and neck of tooth, in which there is danger of debris or powder or food collecting.

in water by virtue of its own lightness, whereas every crystal of the *creta præcipitata* has been thrown down from a condition of semi-suspension in a denser fluid by means of its own greater density. It may be contended that the precipitated form is not entirely exclusively crystalline, but it will be admitted that it is composed largely of crystals.

The mention of crystalline calcic carbonate makes us think of it in its native form, white marble, and who would think of cleaning a delicate structure with a powder having physical properties in any degree like those of marble?

Having satisfied ourselves by means of the official test that our prepared chalk does not contain silica we have a base as nearly perfect as possible.

The presence of myriads of germs in the saliva is easily proved, and there is danger that lingering traces of either solid or liquid food may become, even in the healthy mouth, both septic in influence and acid in reaction.

We do well to counteract these tendencies by giving our base an increased acidity, and also by making it antiseptic, for it is obviously necessary for the well-being of the dental tissues that the fluids of the mouth should be kept alkaline and aseptic.

A small proportion of such an antacid as bi-carbonate of sodium gives the necessary extra alkalinity. Only a small proportion is required, because healthy saliva is itself alkaline, and our mechanical base is already slightly so.

For the antiseptic property we plead strongly for the use of oil of cinnamon. It is free from the objectionable qualities of the harsher antiseptics, such as carbolic acid or eucalyptus oil. Experiments prove it to be an efficient germ-killer. We do not think its antiseptic powers are sufficiently valued. Moreover, used in proper proportion, it is pleasant to the mouth, and imparts a most delightful sensation of cleanliness and sweetness.

Should the typical dentifrice contain an astringent? We think not. Most astringents are unpleasant, and consequently should be omitted, if only for the sake of the children who will be expected to use it.

We leave the embellishing of the preparation entirely to the skill of the pharmacist. As to colour, we see no objection to whiteness. If this be unpopular, let us be careful to use only harmless and neutral tinting ingredients.

We welcome the fashion of putting up the dentifrice in wide mouthed bottles with sprinklers, and condemn any method of putting up in which there is a temptation to dip the wet brush into the powder.

We advise putting the fullest directions on the label. These should include the rinsing of the mouth with water after using the powder, and advice as to the use of a soft brush. Warm water is indispensable in winter, especially for children. If the dentifrice be only used once a day, bedtime is better than morning, but both are to be preferred.

Mr. GROVES (who had taken the chair during the temporary absence of the President), said the paper was a very useful one, but did not call for much comment or criticism. He did not agree with the statement that astringents should be avoided because they were unpleasant; he thought the real question was the utility of the dentifrice, and in some cases the addition of an astringent would be decidedly advantageous.

Mr. MOSS asked if silica would be considered objectionable, provided it were in the form, as in some of the infusorial earths, of very fine powder.

Mr. UMNEY said he did not know anything about tooth powder, but he denied the statement that precipitated milk was thrown down from a condition of semi-suspension. When properly prepared it was made from two solutions in suspension, and it was only a question of trying these solutions to a very great dilution to get a chalk in a state of almost impalpable powder. It is prepared from two solutions—chloride of calcium and carbonate of sodium; but there were all kinds of products passing under the name of precipitated chalk, which differed as much from one another as shoddy from broadcloth.

Mr. MARTINDALE suggested that unless a tooth powder had something in it to take a grip of the teeth it would always answer its purpose. Cinnamon had been noticed as a flavouring ingredient, but he thought any essential oils, when combined with other bases, such as carbonate of soda, would soon lose their flavour.

Mr. TURNER, in reply, said he only objected to the inclusion of an astringent as a normal ingredient. There were many cases where it was required, and it should be supplied. If silica could be found in such a fine state that it would not scratch, he

saw no objection to its use. By a condition of semi-suspension he meant that at the moment of precipitation chalk was formed; it was suspended just for the moment, but began to fall immediately, in contradistinction to prepared chalk, which was suspended long enough to be carried away by the water. A great deal of harm was done by "gripping" tooth-powders, especially those containing pumice-stones. Of course, if oil of cinnamon were used, the powders should be moderately freshly prepared.

The Conference then adjourned until 2 o'clock.

On resuming, the following paper was read:—

EXTRACT OF NUX VOMICA.

BY E. W. LUCAS, F.C.S.

Expressions of opinion have been invited as to whether it would be desirable to replace the present extract of nux vomica by an equivalent of powdered extract in the next edition of the Pharmacopœia. The idea is not a new one, having been advocated by Duncan as long ago as 1889. The loss of moisture on keeping and the consequent increase in alkaloidal strength have been a frequent theme of discussion, and in 1891 Conroy proposed the incorporation of syrupy glucose as a means of preventing loss. Umney and Moss were rather in favour of stiffening the present extract by the addition of inert extractive matter to be obtained by a reprecipitation of the marc with very dilute alcohol. Now it is not an easy matter, except by the aid of an effective drying room or oven, to obtain extract of nux vomica so perfectly dry that it will powder, and even when powdered and diluted it is difficult to preserve in this state, owing to its very hygroscopic nature. Glucose recommends itself as a preservative agent, owing to its insusceptibility to variations of temperature, but many people object to anything not contained in the original drug being introduced into the finished preparation. Besides, it would not tend to stiffen, but rather to thin an extract already too liquid. Moss and Umney's plan for the addition of extractive matter is, perhaps, the least objectionable, but it involves increased labour and cost.

We owe our present process for the manufacture of a standardised extract and tincture to the researches of Dunstan and Short, and when first introduced it seemed to leave little to be desired. Experience however has shown, that there are several drawbacks to the process which, in the opinion of the author, might be obviated. In the first place, the extract is inconveniently thin and soon increases in strength, owing to loss of water; secondly, no provision is made for the removal of the fatty oil, and thirdly, alcohol is used in such large quantities as to make the cost of production very great. This last particularly applies to the preparation of small quantities of the extract, when, even if the spirit is recovered in the usual way, the loss may vary between ten and thirty per cent.

The author ventures to suggest the following as offering a method for the economical preparation of nux vomica extract, which while being firm in consistence and free from oil, shall be little liable to loss by evaporation, owing to the presence of glycerin in the finished product. Briefly the process is as follows:—

Take of—

Nux vomica in fine powder	16 ounces.
Glycerin.....	1 ounce by weight
Acetic acid	2 fluid ounces.
Chloroform water.....	a sufficiency.

Mix the acid with two pints of the chloroform water, and macerate the nux vomica in the mixture in a closed vessel for four days. Transfer to a percolator,

and when the fluid ceases to pass, continue the percolation with chloroform water until one gallon has been collected. The percolate is then evaporated at a low temperature—the glycerin being added towards the end of the operation—to 4 ounces by weight, and 10 grains taken, and the alkaloids determined in the usual way. From the data obtained the extract is brought to the required standard of 15 per cent. of the mixed alkaloids of strychnine and brucine.

If the corresponding dry extract is required, the glycerin must be omitted, and the evaporation continued as far as possible on a water-bath, and the extract finally freed from water in a hot oven or drying chamber, the product being afterwards rapidly powdered and mixed with sufficient inert vegetable powder—such as althaea or liquorice—to bring the final strength up to 15 per cent. The powder must then be stored in small vials, which should be hermetically sealed.

The President having remarked that the question of *nux vomica* was a perennial one,

Mr. NAYLOR said the tendency appeared to be towards the standardisation of preparations. He did not see any particular advantage in the method now suggested, though he could not speak positively, not having tried it. He had been accustomed to use a spirituous preparation of the extract, to dry it carefully, and then to make up the preparation with sugar of milk, and he found no difficulty in obtaining it in a condition of powder. He was disposed to think that a spirituous preparation made in the ordinary way would contain more extractive than when dilute acetic acid was used as the solvent. The aim was a galenic preparation, not merely to get out an alkaloid in its crude condition, and he saw no reason for adopting this method unless it possessed very decided advantages. He was distinctly in favour of a powdered extract, because they knew from experience that a fluid extract which might be standardised to-day might not be of the same strength in a week's time.

Mr. Moss concurred in the view that the present extract was much too thin for convenient use, but it would meet requirements if it were standardised to 20 per cent. instead of 15. As to powdering it, it was necessary in order to preserve the degree of standardisation to add some innocent material after drying, and he thought sugar of milk would answer every purpose.

Mr. LLOYD WILLIAMS asked if any comparative experiments had been tried, making a spirituous extract and an acetic acid one side by side, and comparing the results.

Mr. CROSS asked what was the advantage of using chloroform water over the ordinary distilled water.

Mr. BURNETT asked if Mr. Lucas had made any tincture from the extract prepared as he proposed; and was it as soluble in spirit as the ordinary one. He thought the proceedings of the last Conference had vindicated the use of chloroform water.

Mr. RANSOM said that various specimens of *nux vomica* differed very much in alkaloidal value; and whilst one might yield by this method a good extract, others might give one too hard or too soft. His usual plan was to obtain a suitable extract by mixing different samples; some which would yield a 15 per cent. extract were not much too thin, whilst others yielding 20 per cent. were equal or superior. He would also suggest if a powdered extract were desired that some of the sugar of milk, or whatever diluent were used, should be added during the process of drying, because the extract was so very hygroscopic that a good deal of moisture would be absorbed almost before it was powdered; but that would be to some extent avoided by adding the diluent before.

The PRESIDENT said the paper was a very interesting one, and they were much obliged to Mr. Lucas for it. He was quite right in saying that Messrs. Dunstan and Short devised the process for a standardised preparation, over which there was a good deal of cackling, as if pharmacy had solved the problem. Very soon after the Pharmacopœia was published, at the Birmingham meeting he read a paper on the subject, in which he gave an analysis of a number of specimens and the amount of moisture in them, collected from various sources, and showed how unstable this standardised preparation really was. Sometimes you obtained one in the ordinary course of commerce comparatively dry and relatively hard, but he showed then that the amount of moisture varied from 13 to 19 per cent. The ordinary extract, if exposed in a moist shop, rapidly took up moisture, and the standard was altered. Another weak point was that the standardisation depended on the total alkaloid, and the relative proportion of brucine and strychnine was scarcely alike in any two. In making the tincture again from the extract, his experience was that you could never re-dissolve an extract in alcohol and make a tincture which would act as well as one made from the crude drug itself. The old-fashioned method of percolating the *nux vomica* with spirit to the strength of the tincture was, in his experience, far superior to re-dissolving the extract. Mr. Lucas had made use of a solvent—acetic acid—which he ventured to think would play a very important part in future for alkaloids, and there was no doubt it was the best preservative. He did not think it desirable to introduce glycerin into extracts to be used for making pills. If a chemist dispensed them in that way he might very likely see them back again if it was in the climate of Cornwall, though they might do very well in the Indian Ocean. With regard to powdered extract, he might remind them that in the last edition of the United States Pharmacopœia there was a series of preparations called "Abstracts," which were made from these standardised extracts by the addition of sugar of milk, but after ten years' experience they had been dropped. He hoped Mr. Lucas would follow up the subject, for he should like to see a perfect process, from the pharmaceutical point of view, devised before the next issue of the Pharmacopœia.

Mr. LUCAS, in reply, said one great advantage of using acetic acid for extracting was that it was much cheaper than alcohol, of which a great deal was always lost if you had to use a large quantity to exhaust the drug; operating on small quantities from 5 to 20 per cent. was lost, and probably even more; and makers lost a good deal. Methylated spirit of the old kind might be used in making these extracts because it was all driven off again; but if you were not operating on a large scale, it was hardly worth while, and the new-fashioned methylated spirit, of course, could not be used. By using water, a great deal more extractive was obtained; with a strong spirit the amount in the case of *nux vomica* was very small. Again, the water did not extract any of the oil, while by the Pharmacopœia process nearly all the oil was extracted, which made a very disagreeable extract when used for pills. He had operated on three different kinds of *nux vomica*, and found that one yielded a great deal of extractive matter, and only a little. Most people who made it on a large scale had a difficulty in getting it solid; 15 per cent. was much too thin. Chloroform water was used in order to make it keep. In hot weather, if you percolated with very dilute acetic acid it went bad, but a little methylated chloroform preserved it. With regard to the powdered extract, he did not quite believe in it. As the President had said, the Abstracts

had been rejected in the United States; but if you required to dry the extract, he thought powdered althea would be a better diluent than sugar of milk.

NOTE ON STRYCHNOS IGNATIA.

BY F. RANSOM, F.C.S.

The seeds of *Strychnos ignatia*, Lindley, have long been known to contain the alkaloids which exist in nux vomica, Pelletier and Caventon, in 1819, having shown that strychnine and brucine were present. The drug has since been examined by various chemists, the result of whose investigations has generally indicated that strychnine is present to a much larger extent than in nux vomica. In 'Pharmacographia' it is stated that strychnine exists to the extent of about 1.5 and brucine to .5 per cent. This statement appeared to receive confirmation from Harrington in 1886 (*Amer. Journ. Pharm.*, 1886, p. 14), who examined three samples of the seed, finding on an average 1.196 per cent. of strychnine and .413 of brucine. In each case the strychnine was largely in excess, but as the method employed to separate the alkaloids in two of the instances consisted in washing the strychnine free from brucine with diluted alcohol, the accuracy of the results may be questioned. In the following year, Coblenz ('Proc. Amer. Pharm. Soc.', 1886) examined five samples of the U.S.P. abstract, which yielded total alkaloids varying from 3.88 to 4.74 per cent., of which 2.136 to 3.626 was indicated as strychnine by Schweissinger's alkalimetric method.

In order to compare the active constituents of *ignatia* with those of nux vomica, the following determinations of the seed were conducted by the methods introduced and employed by Dunstan and Short in their investigations of nux vomica and its preparations (*Pharm. Journ.*, [3], xiii., 1053). It was found desirable to use 10 grammes of the finely powdered seed, which was firstly percolated in the cold in the inner tube of a Dunstan and Short extraction apparatus, with 80 C.c. of chloroform containing 25 per cent. of absolute alcohol. When the liquid ceased to drop, the tube containing the marc was inserted into the outer tube, to which was fitted an upright condenser. The flask containing the percolate was attached, and by the heat of a water-bath the extraction was continued until the residue from a few drops of the percolate evaporated to dryness and dissolved in dilute hydrochloric acid ceased to give a precipitate with Mayer's reagent. The alkaloid was then extracted from the chloroformic solution by agitation with dilute sulphuric acid (5 per cent.), which was then rendered alkaline with ammonia, and the solution exhausted with chloroform. The chloroform, on evaporation, left the alkaloids in a practically pure and more or less crystalline condition.

An attempt was made to exhaust the powdered seed with ammoniated chloroform, but it was not found practicable to extract the whole of the alkaloid with this menstruum.

Three specimens of the seed were submitted to analysis, with the following results:—

- (1) 2.22 per cent. strychnine and brucine.
- (2) 1.72 " " " "
- (3) 3.01 " " " "

The mixed alkaloids found by Dunstan and Short in authentic specimens of nux vomica varied from 2.4 to 3.9 per cent., the average being 3.29. As shown above, the percentage in but three specimens of *ignatia* varied from 1.72 to 3.01, with an average of 2.31. It would therefore appear that in the seeds of *ignatia* the variation of total alkaloids is greater, and the average percentage less than in nux vomica.

An analysis was also made of an alcoholic extract of *ignatia* by the official process for the determination

of extract of nux vomica. It was found to contain 16.7 per cent. of moisture and 9.6 per cent. of total alkaloids. The lowest found by Dunstan and Short in their analyses of twelve trade samples of undistilled extract of nux vomica was 10.82 per cent.

Attention was then directed to the separation of the strychnine from the brucine in the alkaloidal residues obtained from "*ignatia*." The ferrocyanide method of Dunstan and Short ('Year-Book of Pharmacy,' 1883, p. 469) was employed, and the following results were obtained:—

Weight mixed alkaloids.	Weight of strychnine	Percentage strychnine.	Percentage of brucine by difference.
Gram.	Gram.		
(a) .1925	.0885	46	54
(b) .153	.075	49	51
(c) .1905	.1045	54.9	45.1

The alkaloidal residue (a) was obtained from the extract. The latter two were derived directly from the seed, and indicate percentages of .84 and 1.65 strychnine, and .88 and 1.85 brucine in the crude drug.

The average proportion of strychnine in the alkaloidal residues obtained by Dunstan and Short from the twelve commercial samples of extract of nux vomica was about 43 per cent., the highest being 50.1, and the lowest 35.8.

It appears, therefore, that although "*ignatia*" may contain a larger proportion of strychnine compared with the brucine than nux vomica, the percentage is more variable and the average percentage of total alkaloids, so far as may be judged by the examination of three specimens, is considerably less.

The glucoside, loganin, discovered by Dunstan and Short in nux vomica and its preparations (*Pharm. Journ.*, [3], xiv., 1025), appears also to be present in *ignatia*. The extract was boiled with ether and the ethereal solution separated and evaporated to dryness. The residue, when warmed with concentrated sulphuric acid, gave a dark purple coloration characteristic of the glucoside.

The results here recorded would indicate that nux vomica is the better adapted for pharmaceutical preparations, and that "*ignatia*," except for the occasional extraction of strychnine, is not likely to prove of much value for medicinal purposes, while the supply of nux vomica remains abundant.

Mr. UMNEY said he was sorry he could not add anything to the information contained in the paper; but "*ignatia*" was so scarce a drug that it was rarely met with in commerce, and was very little used, and he thought the superabundance of nux vomica would prevent "*ignatia*" being used in medicine. It was used on the Continent, but only to a small extent.

Mr. HOLMES said he had had no experience in the extraction of the alkaloid. All he could say was that the seeds varied very much, at least in size, and very likely also in the amount of alkaloid they contained, especially if the smaller seeds came from unripe fruit.

The PRESIDENT said the Conference was much indebted to Mr. Ransom for preparing this paper in addition to his other labours as hon. sec. He had so little experience of "*ignatia*" himself that he could say nothing about it.

REMARKS ON GNETUM.

BY W. ELBORNE, B.A. CANTAB.,

Demonstrator on *Materia Medica* and Pharmacy, University College, London.

Gnetum, L., is a genus of Gymnosperms, giving its name to the natural order Gnetales; the various species are trees or climbing shrubs, natives of the tropical forests of Asia and America, their stems

yielding textile fibres more tenacious than hemp, while the leaves and seeds of certain species are said to be edible when boiled. My apology for drawing your attention to this subject is on account of the stems of *Gnetum* possessing internally the remarkable ringed structure characteristic of the natural order Menispermaceæ, and consequently not unlike "*Pareira brava*"—as a casual glance at the stem of *Gnetum scandens* will show.

The structure of the wood of Menispermaceæ differs from that of other dicotyledons in that the vascular bundles of a young branch (which in most dicotyledons unite and form concentric rings of wood and liber) generally remain distinct in Menispermaceæ, and are separated by broad radial masses of cellular tissue, corresponding to the medullary rays of ordinary wood. After some time these original wood fascicles cease growing, and in the cortical cellular tissue exterior to the liber originates a second circle of bundles, similar to the first formed, excepting in the absence of spiral vessels. After these bundles have attained full development, they in turn cease to grow, and a third circle forms in the cellular tissue of the bark, and so on.

De Bary* alludes to this anomalous mode of thickening of stems and roots in dicotyledons and gymnosperms as follows:—"As is the case with almost all anatomical peculiarities, the anomalies of secondary thickening also are in part evident phenomena of adaptation, and may in part even be explained directly as the outcome of mechanical causes; they are in part unexplained anatomical characters, which must be regarded as inherited. To the first category belong the anomalies of twining and climbing liane-stems from the most different families, whose non-climbing congeners have normal growth, as in the Bignoniaceæ, Sapindaceæ, Leguminosæ, Malpighiaceæ, and others to be named below. The lianes from certain families, especially the Sapindaceæ, or at least the majority of them, show very special peculiarities. On the other hand, a remarkable uniformity is often seen between those belonging to the most different families, as e.g., *Menispermum* and *Gnetum*, *Bignonia*, and some *Apocynaceæ*."

Another point of interest in reference to the subject which I do not remember having observed in the text-books is, that while "*Abutua*" and "*Butua*" are popular Brazilian terms for *Pareira brava* (*Chondodendron*, Ruiz et Pavon) and *Abuta*, Aubl., likewise an allied genus (Menispermaceæ), yet the genus *Abutua*, Lour., is synonymous with *Gnetum*, L.

The following description is from Brandis†:—

"*Gnetum scandens*, Roxb., 'Fl. Ind.', iii., 518, syn. *G. edule*, Blume; vern. Kumbal, umbli, Bombay, is a stout climbing shrub, with opposite coriaceous elliptic-oblong petiolate leaves, 5 to 6 inches long, which turn black on drying; flowers monœcious in cylindric verticillate, paniculate spikes, with numerous short annular sheaths, the flowers mixed with articulate hairs closely packed in their axils. Male flowers monandrous, anthers of two distinct cells, opening by a slit at the apex at the end of a thick column, protruding from a thick clavate angular sheath, which splits in two. Female flowers consisting of numerous naked ovules similarly arranged and mixed with articulate hairs. Fruit an oblong one-seeded drupe, 1 to 1½ inches long, narrowed into a thick short stalk, red when ripe. The seeds are eaten. Common in the dense forests of the Western Ghats and the Konkan—East Bengal, Burma, Indian Archipelago, China. The wood of *Gnetum* consists of a large

number of distinct wedge-shaped ligneous masses, which are arranged in concentric circles, and separated by cellular tissue. It thus resembles the wood of Menispermaceæ.

Specimens of stems of *Gnetum scandens* and *G. urens*, from the Botanical Museum, Cambridge, were shown at the meeting.

Mr. HOLMES said Mr. Elborne had kindly allowed him to see these specimens, and there was certainly a similarity between menispermaceous stems and *Gnetum*, which was very remarkable, and such as hardly expected to see. He had never met with any of these stems in commerce, but it was possible they might occur from time to time, and be a cause of difficulty to the pharmacist. Hardly anything was known of the properties of the genus *Gnetum*, but an allied genus, the *Ephedra*, possessed mydriatic properties. It was desirable that the *Gnetum* should be further examined in case it came into commerce in future. He would ask Mr. Elborne if he could point out any special means of distinguishing the stem from *pareira*.

Mr. MOSS said he many years ago made an examination of *pareira* root and stem as it came into commerce, and found about three times as much stem as root came to the London drug market, and was regarded as root. He made a microscopical examination of the stem and the root, and a description of them would be found in the *Pharm. Journ.*, [3], vi., 702, with diagrams. It seemed to him that the stem now shown was somewhat larger than the usual *Chondodendron* stem, and also that the cortical portion was much more largely developed; it also had a brownish tint, though that was not much of a distinction between one stem and another. The fibro-vascular bundles seemed much more largely developed, but he did not know whether that would turn out so on closer examination. He should like to know if Mr. Elborne had made a pharmaceutical examination of the root at all. He had made some extract of *pareira* stem with a view of ascertaining whether it was of equal value with the root for medicinal purposes, but did not complete the investigation. He believed he had some of the extract still and should be pleased to hand them over to anyone who cared to pursue the subject.

Mr. REYNOLDS said he could not contribute anything to this subject, which he ventured to say was a novel one to everyone present. He would, however, mention, for the benefit of investigators of rare or unknown vegetable products from abroad, that the formation of the Imperial Institute afforded a valuable means of obtaining information with regard to such products. He knew from experience in connection with the Yorkshire College of Science that some of the professors were now engaged on products derived from the Institute, and that Sir F. Abel was always ready to render investigators every assistance in his power.

Mr. BURNETT said it struck him when they were comparing *Gnetum* with the Menispermaceæ that it was not unusual to find menispermaceous stems, very similar to the typical structure of the stems of *Pinus*, and he was not surprised to find the general superficial physical characteristics in this case also.

The PRESIDENT said they were very glad to have this contribution to their proceedings from a member of the sister university. He must say that the word *gnetum* did not convey any idea to him, or he might have brought to the meeting a collection of stems and roots with which the late Mr. Deane used to puzzle some of the students at Bloomsbury Square, amongst which were specimens of *Chondodendron*.

Mr. ELBORNE said he had not made any pharmaceutical examination in this subject which he simply intro-

* 'Comparative Anatomy of Phanerogams and Ferns,' Oxford, 1884.

† 'Forest Flora of North-west and Central India,' D. Brandis. London: 1876. Page 502.

duced it as an endeavour to explain the botanical source of some of the numerous false pareiras. With regard to distinguishing these from menispermaceous stems, there was a practical test, and that was that on the periphery of each ray of wood would be found numerous fibres; in fact, fibre was obtained by the natives from various stems of *Gnetum*, which was said to be stronger than hemp, and the presence of those fibres would be sufficient to indicate the character. Mr. Moss alluded to the bark being more developed than was usual in false pareira stems; the smaller one, which came from the forests of the Amazon, had the cortex largely developed; but the larger one, which came from the East Indies, had the bark closely adherent; they were both together in the Cambridge Museum. Mr. Burnett drew attention to the fact that certain stems possessed pitted cells similar to those of the Coniferae, and he had pointed out in the paper that there were certain plants belonging to the natural order Malpigiaceae, the wood of which possessed a pitted structure. He did not wish to magnify the subject at all, but he had some dozens of stems possessing a menispermaceous structure, and he had been endeavouring to arrive at the botanical source in a rather unusual way, by observing the absorption spectrum given by the various tinctures, but had not been able to develop the results into a paper for this meeting. He might refer to *Cocculus indicus*, which belonged to the same natural order, and afforded a very poisonous preparation, and was not unlikely to be confounded with some of the false pareira stems.

Mr. ALCOCK remarked that the stem, which he had only seen since Mr. Elborne began his reply, seemed somewhat resinous. Would not that afford a distinguishing characteristic, seeing that the Coniferae to which *Gnetum* was closely allied were very resinous, whereas the Menispermaceae would probably not be so resinous?

Mr. ELBORNE said the section of one specimen was resinous, but he should not be inclined to attach much importance to that. He did not think *Gnetum* was a resin-producing plant at all in the same sense as the Coniferae. It was probably an accidental feature in that particular case.

THE RECOVERY OF RESIDUAL TINCTURES FROM MARCS.

BY R. H. PARKER, F.C.S.

The best method for recovering the residual tincture contained in a marc will depend chiefly upon the quantity under operation and the kind of apparatus available. I propose to consider the question as though preparing from 1 to 4 pints of tinctures, etc., with such apparatus as may be found in any pharmacy. Two methods are available for the purpose in view:—Pressure and displacement by water; distillation being applicable to larger operations only.

I. Pressure.—This process is simple and expeditious, but the use of the ordinary tincture-press leaves much to be desired. The best results are obtained when the quantity of marc reaches the maximum capacity of the press. In a recent experiment with 6 pints of tinct. aurant., the tincture when filtered was only 4 ozs. short of the full quantity (the marc on drying lost 5½ ozs.). A similar quantity of tinct. gent. co. gave 6 pints of product less 3½ ozs. (the marc lost on drying 6 ozs.). This shows that the loss can easily be confined to what actually remains in the marc. The loss, however, is much greater (perhaps 30 per cent.) in such preparations as tinct. singib. fort. and linim. belladonnae. Even after hydraulic pressure the marc still retains enough spirit to repay recovery by distillation when working on a large scale. Results almost equal to hydraulic power may be obtained with a good screw press if the cup for receiving the marc be compara-

tively narrow and the marc before pressure nearly fills it. Several sizes of the cups should be fitted to the same press.

II. Displacement by Water.—A critical examination of this process does not appear to have been recorded, although many pharmacists have probably made sufficient observations upon its practice for their own guidance in the laboratory.

The use of water for downward displacement of tinctures dates as far back as 1816, when Réal's filter-press was introduced.

The results of a systematic application of the method to the preparation of tinctures generally was submitted to the British Pharmaceutical Conference at Brighton (1872) by Stoddart and Tucker, in an elaborate paper detailing the comparative examination of forty-seven tinctures, each prepared by three different processes, viz.:—(1) maceration only, (2) the pharmacopoeial combination of maceration and percolation, and (3) percolation with displacement by water. Each of these processes yielded a fair proportion of the best results as regards percentage of extractive, but it was not shown whether displacement by water produced a tincture of diminished alcoholic strength.

The use of water for upward displacement was described by Elborne in 1880 (*Pharm. Journ.*, [3], vol. x., p. 973); his results were fairly good, and might be considerably improved by a modification of his apparatus. In this instance also no determination was made of the alcoholic strength of the finished tincture.

III. In order to estimate the value and practicability of displacement by water, I will deal particularly with critical observations on the phenomena involved in the practice of displacement generally, directing attention chiefly to the contact surfaces of the two liquids and their deportment during passage through the marc.

I may say here that the discussion of the principles concerned in percolation and displacement is frequently confined to a consideration of the well-known laws of hydrostatics and hydrodynamics, as though the marc were a limpid fluid; whereas its influence is precisely as though it were a porous solid, and the passage of the liquid through it must be considered in the light of movement through capillary tubes, where hydrostatic and hydrodynamic effects are either largely discounted or altogether overbalanced by cohesive force, adhesive force, and capillarity. The effect of pressure, too, is often wrongly estimated; as a matter of fact, if the internal resistance of the marc be uniform (as it should be), the only effect of pressure is to modify the rapidity of the process; in other words, with a given speed of percolation it matters not what pressure is needed to produce it, the essential condition being that the rate of percolation shall be such that the fluid shall not pass between the particles at a greater speed than it can permeate through their tissues.

Displacement may be aptly contemplated by imagining two superposed fluids passing steadily through a vertical tube, a considerable portion of which is filled with a porous solid; evidently admixture of the fluids will tend to increase with the speed of the process, while diffusion and especially admixture due to currents induced by varying temperatures will be less in the presence of the marc than in its absence.

IV. "Downward" v. "Upward" displacement by water.—Two parallel experiments were conducted; in each case 2 ozs. cort. cinchens flav. (in No. 40 powder) and 10 ozs. proof spirit were mixed in a 12 oz. bottle and occasionally agitated during three or four days, then poured into a glass tube percolator (2 feet long, 1 inch wide) having muslin tied over the lower end and resting in a funnel and bottle receiver; as soon as the marc filled the tube, and without allowing the liquid to drain away, the upper end was closed with a

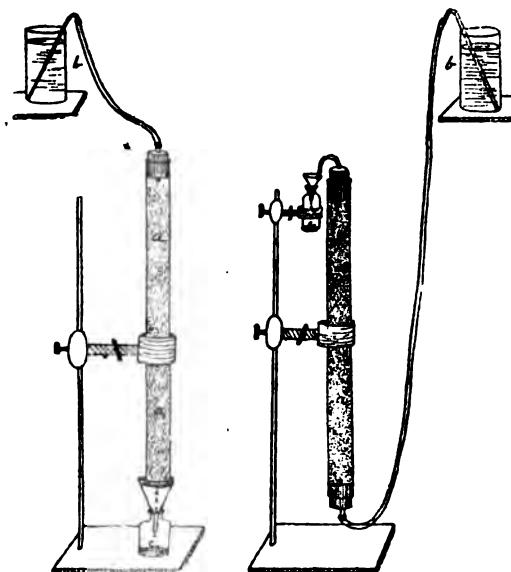
perforated cork carrying a tube connected with a water supply.

In one experiment the water was forced in at the top, and the displaced tincture collected in fractions at the bottom.

In the other experiment the water was forced in at the bottom, and the displaced tincture collected in fractions at the top.

A comparative examination of the specific gravities of the fractions will necessarily reveal the slightest admixture of water in any portion of the product.

The sketch illustrates the two experiments.



Apparatus arranged for "downward" and "upward" displacement respectively.—(a) Glass tube filled with marc; (b) Pressure water supply; (c) Bottle to collect displaced tincture.

The following table indicates the specific gravities

alcohol, and this in turn by water. 20 ozs. powdered ginger was stirred with 40 ozs. of rectified spirit until completely exhausted, allowed to percolate, then displaced with 40 ozs. of rectified spirit, which was followed by water, and the percolate collected in fractions, the gravities of which are tabulated.

Tinct. Zingib. Fort.

Days.	Percolate.	Sp. Grav.	
1	No. 0, 24½ ozs.	·8432	A (Tincture) 40½ oz.
1	1, 8 "	·8427	
2	2, 5 "	·8427	
2	3, 1½ "	·8435	
2	4, 1½ "	·8436	
2	5, 1½ "	·8427	
2	6, 1½ "	·8413	
2	7, 2 "	·8395	
3	8, 6 "	·8386	
3	9, 7 "	·8347	
4	10, 6 "	·8341	B (Alcohol) 39½ oz.
5	11, 3 "	·8340	
8	12, 3 "	·8343	
9	13, 2½ "	·8344	
10	14, 3½ "	·8348	
11	15, 1½ "	·8345	
11	16, ½ "	·8344	
12	17, 1½ "	·8346	
13	18, ½ "	·8364	
13	19, ½ "	·8398	
16	20, 0 "		

The percolates as far as No. 4 were bulked as "Tincture" (No. 5 might have been included, but over 40 ozs. had already been collected); this gradually shaded off into the alcohol without any sharp line of division. The second series of percolates (B) was entirely alcoholic; the water following it would not pass through the muslin. The entire volume of spirit used was recovered without loss. The juncture surface between tincture and alcohol was not visible in the marc, but a distinct brown line encircling the percolator always evidenced the position and progress of the water through it. Comparing the mixed tincture percolates (A) with the mixed alcohol percolates (B), the former had about

Tinct. Cinchona Flav.

DOWNWARD.

UPWARD.

	SPEC. GRAV.	PERCOLATE.		PERCOLATE.	SPEC. GRAV.	
Total Tincture	·9333	6½ ozs.	0	6½ ozs.	·9323	Total Tincture
9·2 ozs.	·9337	1 "	1	1 "	·9324	9·3 ozs.
Sp. Grav. ·9316	·9328	1 "	2	1 "	·9323	Sp. Grav. ·9319.
3·55 per cent.	·9327	3 drs	3	3 drs.	·9320	3·60 per cent.
Solid Residue	·9326	"	4	"	·9319	Solid Residue
½ colour of "5"	·9333	"	5	"	·9334	½ colour of "5"
tinted	·9523	"	6	"	·9563	tinted
pale straw	·9726	"	7	"	·9773	pale straw
nearly colourless	·9800	"	8	"	·9896	nearly colourless
"	·9840	"	9	"	·9930	"
"	·9869	"	10	"	·9931	"

of the fractions collected, "0" being the original percolate before displacement commenced.

The two results are nearly identical. Unaltered tincture continued to percolate in each case as far as the 5th fraction; the 6th fraction appeared strikingly different. Fractions 5, 6, 7 and 8 of each series, showing the overlapping of the fluids, are on the table; it will be at once observed that the precision of displacement is similar in both cases.

V. "Displacement by Water" v. "Displacement by Alcohol."—Strong tincture of ginger was displaced by

5 times the colour and about 12 times the pungency of the latter.

Linim. Belladonnae.

32 ozs. of powdered belladonna root, stirred with 48 ozs. rectified spirit until exhausted, allowed to percolate, then displaced with another 48 ozs. rectified spirit, which in turn was followed by water, and the percolate collected in fractions as before.

It will be seen from this table that a uniform liniment percolated as far as fraction No. 4, when it gradually thinned off into the alcohol down to fraction

No. 9. No water appeared in the percolate until after No. 15, by which time 95 ozs. had been collected out of 96 ozs. taken at commencement. A black line round the marc always indicated the exact position of the water, and its first appearance in the percolate was

Days	Percolate.	Sp. Grav.	
1	No. 0, 13½ ozs.	·8522	A (Liniment) 46½ ozs.
2	1, 20 "	·8522	
2	2, 7 "	·8523	
3	3, 3 "	·8522	B (Alcohol) 48 ozs.
3	4, 3 "	·8522	
3	5, 3 "	·8515	
3	6, 3 "	·8499	5 to 8 colour diminishing
3	7, 3 "	·8486	
4	8, 3 "	·8474	
5	9, 3 "	·8455	9 half colour of O
6	10, 15 "	·8422	
9	11, 11½ "	·8418	
9	12, 3 "	·8412	10 } alike, lighter than 9
10	13, 3 "	·8432	
11	14, 3 "	·8495	
12	15, ½ "	·8878	14 double colour of 13, bright
13	16, 2 "	1·1032	15 cloudy
			16 { Thick black syrup containing about 25 % alcohol

readily observed by watching the transparency of the falling drops. The last drop of No. 15 was limpid and spirituous; the first drop of No. 16 was like black treacle.

VI. *Proof Spirit displaced by Water.*—In preparing 4 pints of tinct. cinchonæ co. the saffron was used in its ordinary condition, the orange peel replaced by an equivalent of tinct. aurant.; the bark, serpentary, and cochineal in No. 40 powder; the whole of the menstruum added, and frequently agitated in a stoppered bottle for six days; transferred to a percolator, the tincture re-percolated until bright, then followed by water and the percolate collected in fractions.

Tinct. Cinchonæ Co.

Hrs.	Perco- late.	Sp. Gr.	
	No. Ozs.		
12	0 63¼	·947	Tincture, 78½ ozs., all bright.
	1 3	·947	
	2 3	·947	
	3 3	·947	
	4 3	·947	
	5 3	·947	
12	6 1	·978	cloudy, much lighter, some ppt. " very light, scarcely ppt. clear, ½-colour of tinct. aurant., no ppt.
	7 3	·991	
	8 3	·997	

In this case the tincture percolate was uniform till all but 1½ oz. (out of 80 ozs.) had been collected. The position of the water was scarcely visible in the marc, but its appearance in the percolate was clearly evident on placing the fractions side by side. The change in gravity could easily be detected by pouring small quantity of one fraction into a previous one, and between the eye and a strong light.

Tinct. Rhei Co.

Four pints of tinct. rhei co. manipulated in a similar manner gave the following results:—

Days	Percolate.	Sp. Gr.	
	No. Ozs.		
1	0 61½	·9351	Tincture, 74 ozs.
2	1 5	·9353	
4	2 1	·9363	
5	3 1	·9357	
8	4 1	·9364	
9	5	·9380	
10	6	·9380	
11	7	·9376	
12	8	·9367	
13	9	·9375	
15	10	·9376	
17	11	·9372	
18	12	·9373	
23	13	·9434	
25	14	·9764	13, clear, limpid. 14, cloudy, syrupy.

This experiment was unsatisfactory, the displacement being so slow that the watery contents of the percolator required occasional stirring in order to facilitate the process; this perhaps accounts somewhat for the comparatively large deficiency (6 ozs. on 80 ozs.). The tincture, however, was faultless.

Tinct. Chirata.

The ingredients for 32 ozs. of tinct. chiratæ were macerated for four days, then percolated in a cylindrical chimney glass, the lower end of which was tied over with muslin; the fractions of percolate had the following characters:—

Days	Percolate.	Sp. Gr.	
	No. Ozs.		
1	0 21½	·9219	Tincture, 30 ozs.
2	1 4	·9236	
"	2 1	·9231	
"	3 1	·9232	
"	4 1	·9231	slightly opalescent.
3	5 1½	·9226	
"	6 1	·9527	
"	7 ½	·9776	
"	8 ½	·9876	rather darker than tincture, bright, slight sediment.
4	9 ½	·9936	
"	10 ½	·9979	
"	11 ½	·9987	
"	12 ½	1·0001	same colour as tincture, still very bitter.
5	13 3	1·0060	

The specific gravities of the fractions indicate clearly where to draw the line for tincture, but at a glance they all seemed alike from 0 to 13; however, on close comparative examination, the opalescent appearance of No. 6 raised suspicion, which was confirmed by the darker colour of subsequent fractions, while the specific gravity bottle finally removed all doubt. The continued bitterness in the marc after No. 13, clearly indicates that the B.P. formula by no means exhausts the herb.

Tinct. Opii.

The marc from four pints tinct. opii after percolation was displaced by water with the following results:—

Percolate.	Sp. Gr.	
N° 0	·950	Tincture ; bright, all same colour. lighter trace deposit. much lighter ; some deposit. very much lighter ; less deposit. " " " " "
1 2 ozs.	·950	
2 2 "	·952	
3 2 "	·968	
4 2 "	·988	
5 2 "	1·006	
6 2 "	1·008	

VII.—*Chloroform displaced by Water*.—Thirty fluid ounces of chloroformum belladonnae, B.P.C., were prepared, and the fluid displaced by water. The progress of the latter in the marc was clearly visible, and the last percolate of chloroform was tardily followed by a black, syrupy extract, which, of course, had no tendency to mix with the displaced fluid. The apparatus was so arranged that displacement occupied about twenty-four hours. The product was 6½ ounces less than the original volume of chloroform taken; this loss may partly be accounted for by the high temperature of the laboratory in July (75°–80° F.).

VIII. The following deductions may be made from an examination of these results:—

1. That the precision of displacement depends not upon the relative position of the superposed fluids, but upon their relative affinities and miscibility at the surface of contact; an alcoholic solution being much more perfectly displaced by water than by alcohol, especially if each fluid holds in solution a substance insoluble in the other, as in alcoholic percolates of ginger, belladonna, aconite, etc.

2. In the downward displacement of alcoholic tinctures by water, diffusion of the latter into the tincture in advance of the rate of percolation takes place to an inconsiderable extent only.

IX. *Conclusion*.—The preparation of tinctures, liniments, etc., by percolation and displacement with water, is much more economical than by screw pressure of the marc; the process is quite reliable if carefully conducted, but is better adapted to stronger spirituous preparations than to proof spirit compounds. It is, perhaps, needless to point out that the method is unsuitable for operation on a large scale.

The chief points to be observed in order to secure good results are:—

1. The materials should be in fairly uniform powder. No. 20 for porous, readily permeable substances; No. 40 or finer for drugs of denser structure.

2. The ingredients should be freely macerated in the whole of the menstruum (either stirred in the percolator or agitated in a bottle) until extraction is complete.

3. Perhaps the most important point of all, however, is that the marc, during displacement, shall be entirely free from air spaces and air channels. To ensure this, particular attention must be paid to the method of packing the marc, and the precise moment when water should be superposed. The marc should be stirred in the percolator with sufficient menstruum to form a semi-fluid mixture; when quite uniform and free from air-bubbles it should be allowed to drain, occasionally jarring the side of the percolator against the hand until it acquires solidity; water should be immediately floated on so as not to disturb the marc (this may conveniently be accomplished by pouring the water gently through a funnel into the inverted lid of an ointment pot, previously laid on the surface of the marc).

4. The displacement should not be rapid, and the percolate should be collected in relatively small fractions when the total quantity approaches completion. Cloudiness of the percolate, or its altered gravity and colour, may be taken to indicate the termination of the process. (To be continued.)

The British Association for the Advancement of Science.

MEETING AT OXFORD.

The sixty-third annual meeting of the above Association commenced at Oxford on Wednesday, August 8, under the presidency of the Marquis of Salisbury, K.G., D.C.L., F.R.S., Chancellor of the University of Oxford, who gave the following address:—

THE PRESIDENT'S ADDRESS.

My functions are of a more complicated character than usually is assigned to the occupants of this chair. As Chancellor of the University it is my duty to tender to the British Association a hearty welcome, which it is my duty as President of the Association to accept. As President of the Association I convey most unworthily, the voice of English science, as many worthy and illustrious presidents have done before me; but in representing the University I represent far more fittingly the learners who are longing to hear the lessons which the first teachers of English science have come as visitors to teach. I am bound to express on behalf of the University our sense of the good feeling towards that body which is the motive of this unusual arrangement. But as far as I am personally concerned, it is intended with some embarrassing results. In presence of the high priests of science I am only a layman, and all the skill of the chemists the Association contains will not transmute a layman into any more precious kind of metal. Yet it is my hard destiny to have to address on scientific matters probably the most competent scientific audience in the world. If a country gentleman, who was also a colonel of Volunteers, were to have any mental aberration on the part of the Commander-in-Chief to be appointed to review an army corps at Aldershot, all military men would doubtless feel deep compassion for his inevitable fate. I beseech some spark of that divine emotion when I am attempting to discharge under similar conditions a scarcely less hopeless duty. At least, however, I have the consolation of feeling that I am free from some of the anxieties which have fallen to those who have preceded me as presidents in this city. The relations of the Association and the University are those of entire sympathy and good will, as becomes common workers in the sacred cause of diffusing enlightenment and knowledge. But we must admit that it was not always so. A curious record of a very different state of feeling came to light last year in the interesting biography of Dr. Pusey, which is the posthumous work of Canon Liddon. In it is related the first visit of the Association to Oxford in 1832. Mr. Keble, at that time a leader of University thought, writes indignantly to his friend to complain that the honorary degree of D.C.L. had been bestowed upon some of the most distinguished members of the Association: 'To Oxford Doctors,' he says, 'have truckled sadly to the spirit of the times in receiving the hodge-podge philosophers as they did.' It is amusing, at the distance of time, to note the names of the hodge-podge of philosophers whose academical distinctions so sorely vexed Mr. Keble's gentle spirit. They were Brown, Brewster, Faraday, and Dalton. When I recollect the lovable and serene character of Keble's nature, and that he was at that particular time probably the man in the University who had the greatest power over other men's minds, we can measure the distance we have traversed since that time; and the rapidity with which the converging paths of these two intellectual luminaries, the University and the Association, have approximated each other. This sally of Mr. Keble's was no passing

or accidental caprice. It represented a deep-seated sentiment in this place of learning, which had its origin in historic causes, and which has only died out in our time. One potent cause of it was that both bodies were teachers of science, but did not then in any degree attach the same meaning to that word. Science with the University for many generations bore a signification different from that which belongs to it in this assembly. It represented the knowledge which alone in the Middle Ages was thought worthy of the name of science. It was the knowledge gained not by external observation, but by mere reflection. The student's microscope was turned inward upon the recesses of his own brain; and when the supply of facts and realities failed, as it very speedily did, the scientific imagination was not wanting to furnish to successive generations an interminable series of conflicting speculations. That science—science in our academic sense—had its day of rapid growth, of boundless aspiration, of enthusiastic votaries. It fascinated the rising intellect of the time, and it is said—people were not particular about figures in those days—that its attractions were at one time potent enough to gather round the University thirty thousand students, who for the sake of learning its teaching were willing to endure a life of the severest hardship. Such a state of feeling is now an archaeological curiosity. The revolt against Aristotle is now some three centuries old. But the mental sciences which were supposed to rest upon his writings have retained some of their ascendancy even till this day, and have only slowly and jealously admitted the rivalry of the growing sciences of observation. The subject is interesting to us, as this undecided state of feeling coloured the experiences of this Association at its last Oxford visit, nearly a generation later, in 1860. The warmth of the encounters which then took place have left a vivid impression on the minds of those who are old enough to have witnessed them. That much energy was on that occasion converted into heat may, I think, be inferred from the mutual distance which the two bodies have since maintained. Whereas the visit of 1832 was succeeded by another visit in fifteen years, and the visit of 1847 was succeeded by another visit in thirteen years, the year 1860 was followed by a long and dreary interval of separation, which has only now, after four-and-thirty years, been terminated. It has equaled the lapse of a generation to draw the curtain of oblivion over those animated scenes. It was popularly supposed that deep divergences upon questions of religion were the motive force of those high controversies. To some extent that impression was correct, but men do not always discern the motives which are really urging them, and I suspect that in many cases religious apprehensions only masked the resentment of the older learning at the appearance and claims of a younger rival. In any case there is something worthy of note, and something that conveys encouragement, in the difference of the feeling which prevails now and the feeling that was indicated then. Few men are now influenced by the strange idea that questions of religious belief depend on the issues of physical research. Few men, whatever their creed, could now seek their geology in the books of their *lignans*, or, on the other hand, would fancy that the laboratory or the microscope could help them to penetrate the mysteries which hang over the nature and destiny of the soul of man. And the old learning no longer contests the share in education which is claimed by the new, or is blind to the supreme science which natural knowledge is exercising in moulding the human mind.

A study of the addresses of my learned predecessors this office shows me that the main duty which it is to a president to perform in his introductory

address, is to remind you of the salient points in the annals of science since last the Association visited the town in which he is speaking. Most of them have been able to lay before you in all its interesting detail the history of the particular science of which each one of them was the eminent representative. If I were to make any such attempt I should only be telling you with very inadequate knowledge a story which is from time to time told you, as well as it can be told, by men who are competent to deal with it. It will be more suitable to my capacity if I devote the few observations I have to make to a survey not of our science but of our ignorance. We live in a small bright oasis of knowledge surrounded on all sides by a vast unexplored region of impenetrable mystery. From age to age the strenuous labour of successive generations wins a small strip from the desert and pushes forward the boundary of knowledge. Of such triumphs we are justly proud. It is a less attractive task—but yet it has its fascination as well as its uses—to turn our eyes to the undiscovered country which still remains to be won, to some of the stupendous problems of natural study which still defy our investigation. Instead, therefore, of recounting to you what has been done, or trying to forecast the discoveries of the future, I would rather draw your attention to the condition in which we stand towards three or four of the most important physical questions which it has been the effort of the last century to solve.

Of the scientific enigmas which still, at the end of the nineteenth century, defy solution, the nature and origin of what are called the elements is the most notable. It is not, perhaps, easy to give a precise logical reason for the feeling that the existence of our sixty-five elements is a strange anomaly, and conceals some much simpler state of facts. But the conviction is irresistible. We cannot conceive, on any possible doctrine of cosmogony, how these sixty-five elements came into existence. A third of them form the substance of this planet. Another third are useful, but somewhat rare. The remaining third are curiosities scattered haphazard, but very scantily, over the globe, with no other apparent function but to provide occupation for the collector and the chemist. Some of them are so like each other that only a chemist can tell them apart: others differ immeasurably from each other in every conceivable particular. In cohesion, in weight, in conductivity, in melting point, in chemical proclivities they vary in every degree. They seem to have as much relation to each other as the pebbles on a sea beach, or the contents of an ancient lumber room. Whether you believe that Creation was the work of design or of unconscious law, it is equally difficult to imagine how this random collection of dissimilar materials came together. Many have been the attempts to solve this enigma; but up till now they have left it more impenetrable than before. A conviction that here was something to discover lay beneath the persistent belief in the possibility of the transmutation of other metals into gold, which brought the alchemy of the Middle Ages into being. When the immortal discovery of Dalton established that the atoms of each of these elements have a special weight of their own, and that consequently they combine in fixed ponderable proportions from which they never depart, it renewed the hope that some common origin of the elements was in sight. The theory was advanced that all these weights were multiples of the weight of hydrogen—in other words, that each elementary atom was only a greater or a smaller number of hydrogen atoms compacted by some strange machinery into one. The most elaborate analyses, conducted by chemists of the highest eminence—conspicuously by the illustrious *Stas*—were directed to the question whether there was any trace in fact of the theoretic idea that the atoms of each element

consist of so many atoms, or even of so many half-atoms of hydrogen. But the reply of the laboratories has always been clear and certain—that there is not in the facts the faintest foundation for such a theory.

Then came the discovery of the spectral analysis, and men thought that with an instrument of such inconceivable delicacy we should at last find out something as to the nature of the atom. The result has been wholly disappointing. Spectral analysis in the hands of Dr. Huggins and Mr. Lockyer and others has taught us things of which the world little expected to be told. We have been enabled to measure the speed with which clouds of blazing hydrogen course across the surface of the sun: we have learnt the pace—the fabulous pace—at which the most familiar stars have been for ages approaching to or receding from our planet, without apparently affecting the proportions of the patterns which, as far as historical record goes back, they have always delineated on the evening sky. We have received some information about the elementary atoms themselves. We have learnt that each sort of atom when heated strikes upon the ether a vibration, or set of vibrations, whose rate is all its own; and that no one atom or combination of atoms in producing its own spectrum encroaches even to the extent of a single line upon the spectrum that is peculiar to its neighbour. We have learnt that the elements which exist in the stars, and specially in the sun, are mainly those with which we are familiar upon earth. There are a few lines in excess to which we can give no terrestrial name; and there are some still more puzzling gaps in our list. It is a great aggravation of the mystery which besets the question of the elements, that among the lines which are absent from the spectrum of the sun, those of nitrogen and oxygen stand first. Oxygen constitutes the largest portion of the solid and liquid substance of our planet, so far as we know it; and nitrogen is very far the predominant constituent of our atmosphere. If the earth is a detached bit whirled off the mass of the sun, as cosmogonists love to tell us, how comes it that in leaving the sun we cleaned him out so completely of his nitrogen and oxygen that not a trace of these gases remains behind to be discovered even by the sensitive vision of the spectroscopist?

All these things the discovery of spectrum analysis has added to our knowledge; but it has left us as ignorant as ever as to the nature of the capricious differences which separate the atoms from each other, or the cause to which those differences are due.

In the last few years the same enigma has been approached from another point of view by Professor Mendeléeff. The periodic law which he has discovered reflects on him all the honour that can be earned by ingenious, laborious, and successful research. He has shown that this perplexing list of elements can be divided into families of about seven, speaking very roughly: that those families all resemble each other in this, that as to weight, volume, heat, and laws of combination, the members of each family are ranked among themselves in obedience to the same rule. Each family differs from the others; but each internally is constructed upon the same plan. It was a strange discovery—strangest of all in its manifest defects. For in the plan of his families there were blanks left, places not filled up because the properly constituted elements required according to his theory had not been found to fill them. For the moment their absence seemed a weakness in the Professor's idea, and gave an arbitrary aspect to his scheme. But the weakness was turned into strength when, to the astonishment of the scientific world, three of the elements which were missing made their appearance in answer to his call. He had described beforehand the qualities they ought to have; and gallium, germanium, and scandium, when they were discovered shortly after the publica-

tion of his theory, were found to be duly clothed with the qualities he required in each. This remarkable confirmation has left Mendeléeff's periodic law in an unassailable position. But it has rather thickened the dissipated the mystery which hangs over the elements. The discovery of these co-ordinate families does not point to some identical origin, without suggesting the method of their genesis, or the nature of the common parentage. If they were organic beings, our difficulties would be solved by muttering the comfortable word "evolution"—one of those indefinite words from time to time vouchsafed to humanity, which have the gift of alleviating so many perplexities and masking so many gaps in our knowledge. But the families of elementary atoms do not breed, and we cannot, therefore, ascribe their ordered difference to accidental variations perpetuated by heredity under the influence of natural selection. The rarity of iodine, and the abundance of its sister chlorine, cannot be attributed to the survival of the fittest in the struggle for existence. We cannot account for the minute difference which persistently distinguishes nickel from cobalt, by ascribing it to the recent inheritance by one of them of an advantageous variation from the parent stock.

The upshot is that all these successive triumphs of research, Dalton's, Kirchhoff's, Mendeléeff's, grant as they have added to our store of knowledge, have gone but little way to solve the problem which the elementary atoms have for centuries presented to mankind. What the atom of each element is, whether it is a movement, or a thing, or a vortex, or a point having inertia, whether there is any limit to its divisibility, and, if so, how that limit is imposed, whether the list of elements is final, or whether any of them have any common origin, all these questions remain surrounded by a darkness as profound as ever. The dream which lured the alchemists to their tedious labours, and which may be said to have called chemistry into being, has assuredly not been realised, but it has not yet been refuted. The boundary of our knowledge in this direction remains where it was many centuries ago.

The next discussion to which I should look in order to find unsolved riddles which have hitherto defied the scrutiny of science, would be the question of what is called the ether. The ether occupies a high, anomalous position in the world of science. It may be described as a half-discovered entity. I dare not use any less pedantic word than entity to designate it, for it would be a great exaggeration of our knowledge if I were to speak of it as a body, or even as a substance. When nearly a century ago Young and Fresnel discovered that the motions of an incandescent particle were conveyed to our eyes by undulation, it followed that between our eyes and the particle there must be something to undulate. In order to furnish that something, the notion of the ether was conceived, and for more than two generations the main, if not the only, function of the word ether has been to furnish a nominative case to the verb "to undulate." Let our conception of this entity have received a notable extension. One of the most brilliant of the services which Professor Maxwell has rendered to science has been the discovery that the figure which expressed the velocity of light, also expressed the multiplier required to change the measure of static or passive electricity into that of dynamic or active electricity. The interpretation reasonably affixed to this discovery is that as light and the electric impulse move approximately at the same rate through space, it is probable that undulations which convey them are undulations of some medium. And as induced electricity penetrates through everything, or nearly everything, it follows that the ether through which its undulations are propagated must pervade all space, whether empty or whether occupied by opaque matter or transparent

matter, or by no matter at all. The attractive experiments by which the late Professor Hertz illustrated the electric vibrations of the ether will only be alluded to by me, in order that I may express the regret deeply and generally felt that death should have terminated prematurely the scientific career which had begun with such brilliant promise and such fruitful achievements. But the mystery of the ether, though it has been made more fascinating by these discoveries, remains even more inscrutable than before. Of this all-pervading entity we know absolutely nothing, except this one fact, that it can be made to undulate. Whether, outside the influence of matter on the motion of its waves, ether has any effect on matter or matter upon it, is absolutely unknown. And even its solitary function of undulating ether performs in an abnormal fashion which has caused infinite perplexity. All fluids that we know transmit any blow they have received by waves which undulate backwards and forwards in the path of their own advance. The ether undulates athwart the path of the wave's advance. The genius of Lord Kelvin has recently discovered what he terms a labile state of equilibrium, in which a fluid that is infinite in its extent may exist, and may undulate in this eccentric fashion without outraging the laws of mathematics. I am no mathematician, and I cannot judge whether this reconciliation of the action of the ether with mechanical law is to be looked upon as a permanent solution of the question, or is only what diplomatists call a *modus vivendi*. In any case it leaves our knowledge of the ether in a very rudimentary condition. It has no known qualities except one, and that quality is in the highest degree anomalous and inscrutable. The extended conception which enables us to recognise ethereal waves in the vibrations of electricity has added infinite attraction to the study of those waves, but it carries its own difficulties with it. It is not easy to fit in the theory of electrical ether waves with the phenomena of positive and negative electricity, and as to the true significance and uses of those counteracting and complementary forces, to which we give the provisional names of negative and positive, we know about as much now as Franklin knew a century and a half ago.

I have selected the elementary atoms and the ether as two instances of the obscurity that still hangs over problems which the highest scientific intellects have been investigating for several generations. A more striking but more obvious instance still is Life—animal and vegetable Life—the action of an unknown force on ordinary matter. What is the mysterious impulse which is able to strike across the ordinary laws of matter, and twist them for a moment from their path? Some people demur to the use of the term "vital force" to designate this impulse. In their view the existence of such a force is negated by the fact that chemists have been able by cunning substitutions to produce artificially the peculiar compounds which in nature are only found in organisms that are or have been living. These compounds are produced by some living organism in the performance of the ordered series of functions proper to its brief career. To counterfeit them—as has been done in numerous cases—does not enable us to do what the force alone can effect—to bring the organism into existence, and to cause it to run its appointed course of change. This is the unknown force which invites to defy not only our imitation but our analysis. Biology has been exceptionally active and successful during the last half-century. Its triumphs have been brilliant, and they have been rich enough not only in immediate result but in the promise of future advance. Yet they give at present no hope of penetrating the great central mystery. The progress which has been made in the study of microscopic life has been very striking, whether or not the results

which are at present inferred from it can be taken as conclusive. Infinitesimal bodies found upon the roots of plants have the proud office of capturing and taming for us the free nitrogen of the air, which, if we are to live at all, we must consume and assimilate, and yet which, without the help of our microscopic ally, we could not draw for any useful purpose from the ocean of nitrogen in which we live. Microscopic bodies are convicted of causing many of the worst diseases to which flesh is heir, and the guilt of many more will probably be brought home to them in due time; and they exercise a scarcely less sinister or less potent influence on our race by the plagues with which they destroy some of the most valuable fruits of husbandry, such as the potato, the mulberry, and the vine. Almost all their power resides in the capacity of propagating their kind with infinite rapidity, and up to this time science has been more skilful in describing their ravages than in devising means to hinder them. It would be ungrateful not to mention two brilliant exceptions to this criticism. The antiseptic surgery which we owe chiefly to Lister; and the inoculation against anthrax, hydrophobia, and perhaps some other diseases, which we owe to Pasteur, must be recorded as splendid victories over the countless legions of our infinitesimal foes. Results like these are the great glory of the scientific workers of the past century. Men may, perhaps, have overrated the progress of nineteenth-century research in opening the secrets of nature; but it is difficult to overrate the brilliant service it has rendered in ministering to the comforts and diminishing the sufferings of mankind.

If we are not able to see far into the causes and origin of life in our own day, it is not probable that we shall deal more successfully with the problem as it arose many million years ago. Yet certainly the most conspicuous event in the scientific annals of the last half-century has been the publication of Mr. Darwin's work on the 'Origin of Species,' which appeared in 1859. In some respects, in the depth of the impression which it made on scientific thought, and even on the general opinion of the world, its momentous effect can hardly be overstated. But at this distance of time it is possible to see that some of its success has been due to adventitious circumstances. It has had the chance of enlisting among its champions some of the most powerful intellects of our time, and perhaps the still happier fortune of appearing at a moment when it furnished an armoury of weapons to men, who were not scientific, for use in the bitter, but transitory polemics of the day. But far the largest part of its accidental advantages was to be found in the remarkable character and qualifications of its author. The equity of judgment, the simple-minded love of truth and the patient devotion to the pursuit of it through years of toil and of other conditions the most unpropitious—these things endeared to numbers of men everything that came from Charles Darwin apart from its scientific merit or literary charm. And whatever final value may be assigned to his doctrine, nothing can ever detract from the lustre shed upon it by the wealth of his knowledge and the infinite ingenuity of his resource. The intrinsic power of his theory is shown at least in this one respect, that in the department of knowledge with which it is concerned it has effected an entire revolution in the methods of research. Before his time the study of living nature had a tendency to be merely statistical; since his time it has become predominantly historical. The consideration how any organic body came to be what it is occupies a far larger area in any inquiry now than the mere description of its actual condition; but this question was not predominant—it may almost be said to have been ignored—in the Botanical and Zoological study of sixty years ago.

Another lasting and unquestioned effect has resulted from Darwin's work. He has, as a matter of fact, disposed of the doctrine of the immutability of species. It has been mainly associated in recent days with the honoured name of Agassiz, but with him has disappeared the last defender of it who could claim the attention of the world. Few now are found to doubt that animals separated by differences far exceeding those that distinguish what we know as species have yet descended from common ancestors. But there is much less agreement as to the extent to which this common descent can be assumed, or the process by which it has come about. Darwin himself believed that all animals were descended from "at most four or five progenitors"—adding that "there was grandeur in the view that life had been originally breathed by the Creator into a few forms or one." Some of his more devoted followers, like Professor Haeckel, were prepared to go a step farther and to contemplate a crystal as the probable ancestor of the whole fauna and flora of this planet.

To this extent the Darwinian theory has not effected the conquest of scientific opinion; and still less is there any unanimity in the acceptance of natural selection as the sole or even the main agent of whatever modifications may have led up to the existing forms of life. The deepest obscurity still hangs over the origin of the infinite variety of life. Two of the strongest objections to the Darwinian explanation appear still to retain all their force.

I think Lord Kelvin was the first to point out that the amount of time required by the advocates of the theory for working out the process they had imagined could not be conceded without assuming the existence of a totally different set of natural laws from those with which we are acquainted. His view was not only based on profound mechanical reasoning, but it was so plain that any layman could comprehend it. Setting aside arguments deduced from the resistance of the tides, which may be taken to transcend the lay understanding, his argument from the refrigeration of the earth requires little science to apprehend it. Everybody knows that hot things cool, and that according to their substance they take more or less time in cooling. It is evident from the increase of heat as we descend into the earth, that the earth is cooling, and we know by experiment, within certain wide limits, the rate at which its substances, the matters of which it is constituted, are found to cool. It follows that we can approximately calculate how hot it was so many million years ago. But if at any time it was hotter at the surface by 50° F. than it is now, life would then have been impossible upon the planet, and therefore we can without much difficulty fix a date before which organic life on earth cannot have existed. Basing himself on these considerations, Lord Kelvin limited the period of organic life upon the earth to a hundred million years, and Professor Tait in a still more penurious spirit cut that hundred down to ten. But on the other side of the account stand the claims of the geologists and biologists. They have revelled in the prodigality of the eons which they put at the end of the earth's hypothetical life. Long cribbed and cabined within the narrow bounds of the popular chronology, they have exulted wantonly in their new freedom. They have lavished their millions of years with the open hand of a prodigal heir indemnifying himself by present extravagance for the enforced self-denial of his youth. But it cannot be gainsaid that their theories require at least all this elbowroom. If we think of that vast distance over which Darwin conducts us from the jelly-fish lying on the primeval beach to man as we know him now; if we reflect that the prodigious change requisite to transform one into the other is made up of a chain of generations, each advancing by

a minute variation from the form of its predecessor, and if we further reflect that these successive changes are so minute that in the course of our historical period—say three thousand years—this progressive variation has not advanced by a single step perceptible to our eyes, in respect to man or the animals and plants with which man is familiar, we shall admit that for a chain of change so vast, of which the smallest link is longer than our recorded history, the biologists are making no extravagant claim when they demand at least many hundred million years for the accomplishment of the stupendous process. Of course, if the mathematicians are right, the biologists cannot have what they demand. If, for the purposes of their theory, organic life must have existed on the globe more than a hundred million years ago, it must, under the temperature then prevailing, have existed in a state of vapour. The jelly-fish would have been dissipated in steam long before he had had a chance of displaying the advantageous variation which was to make him the ancestor of the human race. I see, in the eloquent discourse of one of my most recent and most distinguished predecessors in this chair, Sir Archibald Geikie, that the controversy is still alive. The mathematicians sturdily adhere to their figures, and the biologists are quite sure the mathematicians must have made a mistake. I will not get myself into the line of fire by intervening in such a controversy. But until it is adjusted the laity may be excused for returning a verdict of "not proven" upon the wider issues the Darwinian school has raised.

The other objection is best stated in the words of an illustrious disciple of Darwin, who has recently honoured this city by his presence—I refer to Professor Weismann. But in referring to him, I cannot but give, in passing, a feeble expression to the universal sorrow with which in this place the news was received that Weismann's distinguished antagonist, Professor Romanes, had been taken from us in the outset and full promise of a splendid scientific career.

The gravest objection to the doctrine of natural selection was expressed by Weismann in a paper published a few months ago, not as agreeing to the objection, but as resisting it; and therefore his language may be taken as an impartial statement of the difficulty. "We accept natural selection," he says, "not because we are able to demonstrate the process in detail, not even because we can with more or less ease imagine it, but simply because we must—because it is the only possible explanation that we can conceive. We must assume natural selection to be the principle of the explanation of the metamorphoses, because all other apparent principles of explanation fail us, and it is inconceivable that there could yet be another capable of explaining the adaptation of organisms without assuming the help of a principle of design."

There is the difficulty. We cannot demonstrate the process of natural selection in detail; we cannot even, with more or less ease, imagine it. It is purely hypothetical. No man, so far as we know, has ever seen it at work. An accidental variation may have been perpetuated by inheritance, and in the struggle for existence the bearer of it may have replaced, by virtue of the survival of the fittest, his less improved competitors; but as far as we know no man or succession of men have ever observed the whole process in any single case, and certainly no man has recorded the observation. Variation by artificial selection, of course, we know very well; but the intervention of the cattle breeder and the pigeon fancier is the essence of artificial selection. It is effected by their action in crossing, by their skill in bringing the right mates together to produce the progeniture they want. But in natural selection who is to supply the breeder's place? Unless the crossing is properly arranged, the new breed will never come into being. What is

secure that the two individuals of opposite sexes in the primeval forest, who have been both accidentally blessed with the same advantageous variation, shall meet, and transmit by inheritance that variation to their successors? Unless this step is made good, the modification will never get a start; and yet there is nothing to insure that step, except pure chance. The law of chances takes the place of the cattle breeder and the pigeon fancier. The biologists do well to ask for an immeasurable expanse of time, if the occasional meetings of advantageously varied couples from age to age are to provide the pedigree of modifications which unite us to our ancestor the jelly-fish. Of course, the struggle for existence, and the survival of the fittest, would in the long run secure the predominance of the stronger breed over the weaker. But it would be of no use in setting the improved breed going. There would not be time. No possible variation which is known to our experience, in the short time that elapses in a single life between the moment of maturity and the age of reproduction, could enable the varied individual to clear the field of all competitors, either by slaughtering or starving them out. But unless the struggle for existence took this summary and internecine character, there would be nothing but mere chance to secure that the advantageously varied bridegroom at one end of the wood should meet the bride, who by a happy contingency had been advantageously varied in the same direction at the same time at the other end of the wood. It would be a mere chance if they ever knew of each other's existence—a still more unlikely chance that they should resist on both sides all temptations to a less advantageous alliance. But unless they did so the new breed would never even begin, let alone the question of its perpetuation after it had begun. I think Professor Weismann is justified in saying that we cannot, either with more or less ease, imagine the process of natural selection.

It seems strange that a philosopher of Professor Weismann's penetration should accept as established a hypothetical process, the truth of which he admits that he cannot demonstrate in detail, and the operation of which he cannot even imagine. The reason that he gives seems to me instructive of the great danger scientific research is running at the present time—the acceptance of mere conjecture in the name and place of knowledge, in preference to making frankly the admission that no certain knowledge can be attained. "We accept natural selection," he says, "because we must—because it is the only possible explanation that we can conceive." As a politician, I know that argument very well. In political controversy it is sometimes said of a disputed proposal that it "holds the field," that it must be accepted because no possible alternative has been suggested. In politics there is occasionally a certain validity in the argument, for it sometimes happens that some definite course must be taken, even though no course is free from objection. But such a line of reasoning is utterly out of place in science. We are under no obligation to find a theory, if the facts will not provide a sound one. To the riddles which nature propounds to us the profession of ignorance must constantly be our only reasonable answer. The cloud of impenetrable mystery hangs over the development, and all more over the origin, of life. If we strain our eyes to pierce it, with the foregone conclusion that the solution is and must be attainable, we shall only mistake for discoveries the figments of our own imagination. Professor Weismann adds another reason to his belief in natural selection, which is certainly characteristic of the time in which we live. "It is conceivable," he says, "that there should be another principle capable of explaining the adaptation of organisms without assuming the help of a principle of

design." The whirligig of time assuredly brings its revenges. Time was, not very long ago, when the belief in creative design was supreme. Even those who were sapping its authority were wont to pay it a formal homage, fearing to shock the public conscience by denying it. Now the revolution is so complete that a great philosopher uses it as a *reductio ad absurdum*, and prefers to believe that which can neither be demonstrated in detail, nor imagined, rather than run the slightest risk of such a heresy.

I quite accept the Professor's dictum that if natural selection is rejected, we have no resource but to fall back on the mediate or immediate agency of a principle of design. In Oxford, at least, he will not find that argument is conclusive, nor, I believe, among scientific men in this country generally, however imposing the names of some whom he may claim for that belief. I would rather lean to the conviction that the multiplying difficulties of the mechanical theory are weakening the influence it once had acquired. I prefer to shelter myself in this matter behind the judgment of the greatest living master of natural science among us, Lord Kelvin, and to quote as my own concluding words the striking language with which he closed his address from this chair more than twenty years ago: "I have always felt," he said, "that the hypothesis of natural selection does not contain the true theory of evolution, if evolution there has been in biology I feel profoundly convinced that the argument of design has been greatly too much lost sight of in recent zoological speculations. Overpoweringly strong proofs of intelligent and benevolent design lie around us, and if ever perplexities, whether metaphysical or scientific, turn us away from them for a time, they come back upon us with irresistible force, showing to us through nature the influence of a free will, and teaching us that all living things depend on one everlasting Creator and Ruler."

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

In the Birmingham Police Court, on August 10 Messrs. Fisher, Ryland, and G. Tangye heard three summonses against Birmingham chemists, instituted under the Sale of Food and Drugs Act. Thomas Gilman,* described as a chemist and druggist, Gosta Green, was summoned for having sold to the prejudice of the purchaser a quantity of precipitated sulphur, which contained 57 per cent. of sulphate of lime. Mr. McCardie defended. Thomas Davis, inspector under the Food and Drugs Act, stated that he visited defendant's shop at 10 a.m. on July 17, and obtained from the assistant, Thomas Birch, two ounces of precipitated sulphur, for which he paid 1½d. Dr. Hill subsequently analysed the sample, reporting it to contain 57 per cent. of sulphate of lime. The defendant was fined 40s. and costs.—John Thomas Cattell, chemist and druggist, of 217, Great Lister Street, was summoned for selling tincture of senna which contained only 25 per cent. of the proper ingredients. Mr. Mountford, who defended, said the reason the tincture purchased did not contain the proper percentage of ingredients was because the assistant had omitted to shake the bottle. A fine of 40s. and costs was imposed.—Aquila Baldwin,* of 163, Great Lister Street, was similarly fined for selling tincture of rhubarb which contained only 80 per cent. of the solid ingredients. The defence in this case was the same as in the one preceding.—*Birmingham Gazette*.

* This name does not appear on the Register of Chemists and Druggists for 1894.

POISONING CASES AND INQUESTS.

ALLEGED DEATH FROM USE OF NOXIOUS DRUGS.

At the inquest, on July 31, on the death of Mary Ann Irish, aged 33 years, wife of an optical case maker, residing at 42, Gaywood Road, Walthamstow, who died on the 22nd ult. from the alleged effects of noxious drugs, Dr. Edward Cornish, who made a post-mortem examination, said the cause of death was acute suppurative peritonitis. Drugs taken in large doses would produce the state of things he discovered. If medical aid had been called in earlier life might have been saved.

Richard Wilson, who had been acting as *locum tenens* to Mr. Andrews,* chemist, of 94, St. Mary's Road, said that what he supplied the deceased with was sold over the counter every day.

The Coroner: Yes, for a special purpose.

Witness added that he supplied these things prior to the deceased telling him that she had taken anything. He didn't recommend any of the drugs. He thought that what he supplied was not sufficient in quantity to do any injury. When he heard the woman was ill he took her a bottle of medicine composed of tincture of opium and chloroform water. Finding her very ill, he advised her to call in a doctor. He called in a friendly way, and not as a medical man.

The Coroner remarked that chemists had no right to prescribe. He thought further inquiries should be made, and also that the bottles and labels should be produced.

The jury concurred, and the inquiry was adjourned.—*Star*.

THE UNRESTRICTED SALE OF CARBOLIC ACID.

On August 2 an inquest was held by Deputy Coroner Taylor, at the Devonshire Arms Inn, Bakerswell, on the body of Charles Gregory, aged 42 years, deputy registrar of births, deaths, and marriages. John Roberts Thompson, chemist, deposed that he sold deceased a 6d. bottle of carbolic acid about 11 a.m. on Monday, and he believed the broken bottle produced was the same bottle. Carbolic acid was not a scheduled poison, and anybody could buy a sixpenny bottle without inquiry. Deceased said he wanted it for disinfecting purposes. There was nothing peculiar about the deceased when he came to his shop. By the Coroner: He regarded carbolic acid as a poison, and it ought to be scheduled. Dr. Fentem deposed that the deceased died from carbolic acid poisoning. Immediately after swallowing the carbolic acid he would put his hand to his head and fall forward insensible. By the Coroner: He could have done nothing for him had he seen him when Beere did. Carbolic acid would have the same effect if used externally, and if half that bottle produced were poured over witness's body it would kill him. It had a peculiar action on the nervous system. He would be dying when found. He regarded it as a scandal to the country that carbolic acid was not scheduled to prevent it being sold. It was the most dangerous poison, and produced frightful death. The deceased had taken opium once, and witness found fault with him for doing so. He had been in a very uncomfortable condition of mind, and had complained of trouble at home. A verdict of "Committed suicide during temporary insanity" was returned, and a rider added "That, in view of the many suicides through the use of carbolic acid, a recommendation go to the proper quarter that this dangerous poison be scheduled."—*Sheffield Independent*.

* This name does not appear on the Register of Chemists and Druggists with the address mentioned.

ACCIDENTAL POISONING BY CARBOLIC ACID.

On Tuesday, August 7, before Mr. E. A. Gibson, deputy coroner of Liverpool, an inquest was held touching the death of John Stephenson, aged 53, a house painter, who lived at 22, Edgeware Street. It appeared that the deceased was in the habit of taking a drink of beer out of a bottle on Sunday mornings, and that his wife usually left the bottle on a table at the bedside. The latter had for many years disinfected the house each night, using carbolic acid for that purpose. The acid was contained in a bottle of the same size and practically the same shape as the beer bottle, by the side of which it was frequently placed. On the Sunday morning the deceased drank out of the wrong bottle, and soon afterwards expired, notwithstanding prompt medical treatment. Evidence was given to the effect that deceased was of a cheerful disposition, and lived on the happiest terms with his family. A verdict of "Death from misadventure" was returned.—*Liverpool Mercury*.

Correspondence.

THE PATENT MEDICINE VENDORS' ASSOCIATION.

Sir,—In common with, I suppose, the rest of the trade, I have received a circular from the above. It points out "all such chemists who join us will not be interfered with," and any chemist who does not join this society will be considered antagonistic to us. I consider this, Mr. Editor, to say the least of it, very coercive, in fact, almost a species of "blackmail." I am looking forward to the Society giving an opinion on the subject. It seems to me this is an effort to break up the Pharmaceutical Society, for those chemists who are prosecuted will naturally expect the Pharmaceutical Society to defend, not that I individually see that they are called upon to do so, yet there are those who think this new association ought to be allowed to exist to annoy the legitimate trade. I trust, however, that the "hundreds of chemists" who are in sympathy with this association exist only in the imagination of the defense association's fertile brain. Those who join it (in a moment of weakness, let us hope) fall into a great error. "YORKSHIREMAN."

Obituary.

Notice has been received of the death of the following:—

On July 19, William Smith, Chemist and Druggist, Egham. (Aged 62).

On July 25, William Richard Clarke, Pharmaceutical Chemist, Northampton. (Aged 63).

On July 28, Walter C. Drew, Pharmaceutical Chemist, Borough. (Aged 33).

On July 31, Henry S. Weeding, Chemist and Druggist, West Cowes. (Aged 76).

On August 7, George Galloway, Chemist and Druggist, Inverness. (Aged 84). Mr. Galloway was a subscriber to the Benevolent Fund and was greatly respected by the whole pharmaceutical community at Inverness.

Answers to Correspondents, etc.

"Clifford."—1. *Picris hieracioides*. 2. *Erigeron canadense*. 3. *Galinsoga parviflora*. 4. *Nasturtium sylvestris*. 5. Material insufficient for determination. Send a young plant with root, leaves, and a raceme of ripe fruit. *Parietaria officinalis*.

Jas. McDerment.—Chemists and druggists must exercise their discretion with regard to the adoption of the first method. See latter part of section 17 of the Pharmacy Act, 1868, and section 3 of the amending Act, 1870 (Calendar, pp. 30 and 85). In any case there may be a certain measure of risk attending the transaction.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Gadd, Ince, Junor, Martin, Naylor.

THE PRESENT POSITION OF PHARMACY IN GERMANY.

The twenty-third general meeting of the German Apotheker Verein, which took place last week at Cassel under the presidency of Herr Frölich, of Berlin, furnishes an opportunity for placing before our readers some account of the present position of pharmacists in the German empire, and of the views generally entertained by them as to the future of pharmacy in that country. The legislative conditions under which pharmaceutical practice has long been carried on there, differ very widely from those obtaining in Great Britain; but in regard to influences incidentally exercised by changes which have taken place, during recent years, in the general conduct of business, there are, nevertheless, many points of resemblance between the difficulties experienced in the practice of pharmacy in this country and those which are, at the present time, becoming an increasing source of anxiety to our German brethren. For that reason it will be useful to consider the views that are held by them in regard to the general position of the pharmacist, and to describe the endeavours that are being made to conserve and improve that position in accordance with the traditions of the past and modern requirements.

It has been customary to regard the German "apotheker" or pharmacist as a specially privileged individual, necessarily enjoying the advantages of superior education and technical training, protected by the state in the exercise of his calling, and free from the embarrassing influences of trade competition. Those conditions, though highly desirable in themselves, were to a great extent the result of a system of regulation on the part of the State little in accord with the customs or opinions prevailing in this country. The pharmacist has been secured an adequate business by a limitation of the number of pharmacies proportionately to population, and by the prohibition of dispensing by medical men; but he has been strictly controlled in the conduct of his business, and his charges have been subject to legal tariff. As a person engaged in the exercise of a branch of the medical art, his establishment was also subject to periodical inspection by the medical authorities. This system has been in force so long as to have become an accepted custom, and it has been very generally regarded as appropriate and beneficial, inasmuch as it served to maintain the professional position of the pharmacist even in small towns and villages. Modern developments have, however, tended to interfere with the protection thus afforded. The supply of medicinal agents on purely trade lines and promoted by recommendatory advertisements addressed to the public, has gradually acquired such dimensions as to constitute a competition against which the pharmacist is unable to protect himself. Hence has arisen the question whether modification of the existing system is not requisite? This question has long been considered by the government from the point of view of public policy, and by the apothekers out of regard for the interests of their craft as a means of existence. The tendency of the government is to make the right to carry on the business of an apotheker a purely personal one, and the ultimate result of that tendency would be to

abolish the limitation of pharmacies, which has hitherto been a means of protection, in favour of a free trade system, under which suitable technical qualification would be the only condition indispensable for carrying on the business. On the other hand the apothekers have been concerned with the consideration as to what the requisite qualification shall be, and what is to be the character of their business in the future? This is, in general terms, the nature of the question which has now been engaging attention for several years under the name of the "Gewerbefrage."

Another question of equal importance relates to the systematic regulation of the practice of pharmacy, and in regard to this subject there is evidence of a strong desire on the part of pharmacists to develop the practice of their calling far beyond the limits which have hitherto obtained generally. It is contended that, in order to meet all the requirements of the case, the regulation and control of pharmaceutical affairs should be in the hands of a special State department, in which the apothekers would be represented by members of their own body. This is the subject of "Ständevertretung" which, in conjunction with the "Gewerbefrage," has been for several years a prominent topic in the discussions of the Apotheker Verein and other organisations of German pharmacists. These two subjects have long engaged the attention not only of the government, but also of every one connected with pharmacy in the German empire.

The main features of the present position of pharmaceutical affairs in Germany may be conveniently represented by a brief sketch of the proceedings at the late general meeting of the Apotheker Verein, and especially by reference to some parts of the address delivered by the President, Herr Frölich. The association now represents the whole German empire, and comprises seventy-nine provincial branches, which are entitled to send to the annual general meeting delegates to vote on the questions discussed, and in the election of members of the "Vorstand" or executive body. On the late occasion eighty-six delegates were present, representing sixty-six provincial branches. At the first sitting the association was very heartily welcomed on behalf of the local government officials and by the municipal authorities of the town. Dr. Endemann, one of the speakers, in expressing the view—derived from long experience as a practising physician—that the relation of pharmacists to medical men must necessarily be very intimate, remarked that in the future, as in the past, the practice of their art, based upon the solid foundations of science and faithful performance of duty would certainly enable them to overcome adverse influences and to survive the political changes which are still to be anticipated. The expression of that view by a medical man was referred to by Herr Frölich as being especially pleasing to pharmacists because of the frequently less friendly disposition of their medical cousins, and because so many of them fail to appreciate how much the maintenance of the position of medicine is dependant upon its support by pharmacy. In welcoming the foreign guests, the President also spoke of their presence as a satisfactory indication that the desirability of acting together is recognised by the pharmacists of other countries besides Germany.

In the President's address, the support and recog-

nition received by the executive council of the Verein was referred to as evidence that in its work it had been duly mindful of the interests of the whole body. The objection, made in some quarters, that it had not brought forward any definite measure of reform and had, in regard to some suggestions having that object, merely taken a *non possumus* position, was declared by him to have no better foundation than intentional disregard of fact. He pointed out that the difficult task of devising measures for the regulation of a business affecting so many interests could not, in any case, be performed expeditiously, however great the desire to make the pharmacy and the pharmacist useful, necessary and appreciated factors of our social organisation. To attempt that solely from the point of view of the pharmacist and merely with regard to his material interests and position would be a mistake. Such a mode of dealing with this matter he characterised as being neither possible nor desirable. The failure of the endeavours made by the government since the early part of the century, he regarded not so much as giving evidence of their impracticability as of the want, in many respects, of any sufficient need for alteration in the conditions which have hitherto existed. It has thus been recognised above all, that from the public point of view, improvement of those conditions could scarcely be devised, and it should therefore be the object of pharmacists still further to justify this indirect recognition of the fitness of the system hitherto prevailing.

In regard to the future, Herr Frölich pointed out that the aim of the "Vorstand," in the conduct of the affairs of the Verein was not to provide an immediate legislative panacea; but to promote the progress of the body it represents, in such a manner that it should keep pace with scientific, technical and social development. That is very well to be done within the bounds of the existing system, though its capabilities are not in all cases so well appreciated as they might be. It is at least interesting to note that on the whole the complaints urged against the German apothekers are but few. The government has nothing worse to complain of than the irregular traffic in pharmacies. That excessiveness is as much deplored by apothekers as by other right-minded persons; but it is a result of social and commercial conditions, and of their general development, which is not to be done away with by pharmacists themselves or even by the government. The more important question to be considered is whether the body is progressing in the same degree as other callings, whether it has sufficiently kept pace with the progress of science? In the practice of medicine there has been immense advance within recent years. Pharmacists regard with satisfaction the important and responsible position which medicine has acquired in the life of the State. That position has been acquired by improved education. But medicine has also taken in hand a number of scientific functions which formerly belonged exclusively to pharmacy, and it is at least doubtful whether that is conducive to the public good. The progress of science is too rapid to admit of its results being appropriated by the members of a single professional body. The older and more experienced physicians still rely upon the aid of pharmacists, and they, without desiring to invade a sphere outside their

calling, must prepare themselves to assist medical men in such portions of their work as they are unable to perform in a perfect manner. In order to do that it is necessary that pharmacists should stand on the same educational level as medical men. It is not the fault of pharmacists that this is not the case, but the fault of the government. The demand for a higher educational training has long been urged upon the government, and it has hitherto met with steadfast refusal. The reasons given for that refusal are insufficient, and they continue to be possible only because the apotheker body has no representation in government departments. On the part of the governmental representatives of medicine, pharmacists are regarded not only unfavourably, but with some jealousy—it is feared that when the apotheker is able to fly he may develop. Here, again, it may be seen there is an appreciative recognition of the body. The demand for the adoption of a higher educational standard must, however, continue to be pressed, as that is the only means by which it will be possible to claim that the control of pharmacies shall be placed in the hands of persons possessing technical knowledge. When that is the case, the pharmacist will be able to help the physician in a manner very different from that in which he helps him now, and by undertaking duties which the physician is unable to perform, though they are required.

These considerations show that the question as to the future is not so much one concerning the development of the material interests of pharmacists; but that it is a question what the pharmacist is to become, and what the pharmacy is to be? That question cannot be solved by the temporary expedients which the Prussian government has adopted in regard to concessions, and it will remain open until entirely new ground is taken concerning it. According to the view held by Herr Frölich, the pharmacy of the future will not be a place for the sale of specialities, but a hygienic institute adapted to modern requirements, since that is the province in which the pharmacist is best of all capable of supporting and assisting the physician. It will cause no degradation of the physician, but rather induce an augmented respect for him, if he has, in the pharmacist, a trustworthy assistant in his labours.

In the governmental organisation relating to food supply, a number of questions, which cannot now be dealt with, would become solvable with ease if the State were able to avail itself of the services of a pharmacist in every small town or village as a trustworthy person for the performance of the requisite work. That desirable result could only be effected by means of a system necessitating better educational training. The reorganisation, in such a way, of the conditions under which the exercise of pharmacy is carried on, so that the State and the public would be provided with a more highly educated and more competent practitioner of his art, would render unnecessary any apprehension as to the future of the craft. In conclusion, Herr Frölich appealed to the members of the Verein to entrust the 'Vorstand' with the duty of endeavouring in every possible way to place their craft in a position of equality with other professional callings so that the pharmacist might not stand as a stepson among the offspring of the sciences.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, AUGUST 18, 1894.

Communications for the Editorial department of the Journal, books for review, etc., should be addressed to the EDITOR, 17, Bloomsbury Square, London, W.C.

Instructions from Members, Associates, and Students, respecting the transmission of the Journal, should be sent to MR. RICHARD BREMIDGE, Secretary, 17, Bloomsbury Square, London, W.C.

Advertisements and remittances must be sent to the Office of the PHARMACEUTICAL JOURNAL, 5, Serle Street, Lincoln's Inn, London, W.C., where Copies of the Journal may be Purchased. Cheques and Money Orders should be made payable to "STEWART BROTHERS."

COUNTER PRESCRIBING.

In a recent number of the *Asclepiad*, Sir BENJAMIN WARD RICHARDSON referred somewhat sympathetically to the practice of counter prescribing by chemists and druggists, and recommended that it should be recognised and legalised, a special examination being provided and a qualification granted on its results, which should extend "solely and legitimately to counter practice, never to out-door visiting." This, it was urged, "would define responsibilities and duties in the clearest manner; it would not give the dispenser . . . the right to call himself a registered practitioner of medicine; but it ought to give him the right to dispense publicly medicinal substances with qualified judgment. With the class of men who would by these steps become the pharmacutists of this country, the professors of medicine and surgery proper need have no cause for quarrel nor jealousy. They would be highly educated men, occupying a true scientific position; and they would be such able dispensers and professional allies that all who were engaged in practice purely would cease to feel any necessity for dispensing medicines, or for doing anything more than attend the sick and prescribe for them."

Subsequently, speaking at the annual dinner of the Pharmaceutical Society, Sir DYCE DUCKWORTH objected to the views adopted by Sir BENJAMIN RICHARDSON, and said he would throw down the gauntlet at once to him to come and affirm the doctrine he had promulgated in the presence of the Society. He thought he knew how such a proposition would be received, and was quite sure he was the mouthpiece of those present in saying they would all repudiate that recommendation entirely. "He would throw down another challenge, and ask Sir BENJAMIN RICHARDSON to come and make that statement to the College of Physicians, and he would promise him if he would

take a vote upon it he would be left in a minority of one. He felt sure they would all decline to act upon such a recommendation, it was not their work; they knew it was not their work, and did not wish it to be their work. They had something much better to do, and they did it."

By the publication of an article on "Pharmaceutical Apothecaries," in which he reiterates and elaborates his views, Sir BENJAMIN may be regarded as having accepted the challenge. In the first place several instances are related in which it is somewhat rashly assumed that chemists and druggists "broke the law—when humane motives prompted them in cases of urgent necessity to show that their general training had fitted them for performing, on emergency, other than the functions usually associated with their calling—and it is urged that "the safety of counter practice lies in this fact of necessity." The ordinary chemist and druggist or pharmacist, however, should not be permitted to prescribe until he is legally qualified for the duty and becomes a "pharmaceutical apothecary." A competent examination, it is suggested, might be conducted by a conjoint board formed from the Apothecaries' and Pharmaceutical Societies, the curriculum should include a sufficient measure of hospital practice, and the successful candidates should then be duly registered. "Another reason" why a new class of practitioners should be created is stated in the words "that the gentlemen who are engaged in pharmaceutical work are becoming aggressive therapeutists," and that the danger accompanying this practice may best be averted by controlling it. "Turn the members of the chemical body that engages in pharmacy into a qualified medical body, that shall find sufficient scope for its skill without breaking out into new and theoretical enterprises which have in them pretence of practical and scientific meaning, without any reality of science. The public requirement, in its natural form, is assistance in emergency or casualty; that the public will have, and if we do not give it what it usefully wants, it will take, in its ignorance, what it does not want, what it deems is useful, but that is not so useful as it might be, and may, from its unskillfulness, be hurtful."

It is extremely doubtful if any chemists and druggists will, upon full consideration, approve of this scheme for bringing them under the control of the Medical Council, yet this is practically what is proposed. The pharmaceutical apothecaries "would, as they now do, perform the minor and emergency duties, would dispense prescriptions, conduct analyses if necessary, and, although in business, would be amenable to medical rule and direction, under the protection of medical rank and registration, and under the supervision of the Medical Council."

Even the hope of realising "the large profits that ought to follow proper and competent advice" will hardly prove sufficient to induce the sacrifice of independence, and it is questionable whether "the tone of business in the ranks of the chemist apothecaries would naturally change" any more rapidly than it does at present. Again, the better class pharmacist is only too pleased to discard "patent medicines" and other goods, the sale of which is "looked down upon as inferior business"; he is not likely by becoming a counter prescriber to receive any fresh inducement to devote himself "to scientific and chemical studies leading to the higher ranks of learning and science;" and he will probably object to pose as a check to encroachment upon the "legitimate domain of medicine" by the "outrageous quack." Apart, however, from the objections that may be raised from the pharmaceutical side, it now remains to be seen whether Sir DYCE DUCKWORTH is satisfied that his challenge has been fully and properly accepted, as pharmacists will be greatly interested by the prospect of a reply from his pen.

THE "PROGRESSIVE PHYSICIAN."

A CORRESPONDENT of the *St. James's Gazette* states that a few days ago he received a circular from a firm of druggists which began as follows:—"Dear Sir,—In venturing to again approach you with regard to our preparations, which cannot fail to be of interest to the progressive physician, we desire to more particularly emphasise the tonic properties of that ideal mode of exhibiting, etc., etc." He remarks that he has nothing to say against the firm in question or their ideal preparations, but the expression "progressive physician" took his fancy and set him thinking. "What is a progressive physician?" "Probably the term was only intended by the clever gentleman who drafted the circular as a smart way of describing the physician who keeps abreast of modern knowledge; but I venture to think it has another and more appropriate application. There is, in fact, a class of doctors whom it fits exactly, and for whom we have long wanted a name, since 'quack' is inapplicable, besides being libellous, and 'humbug' uncomfortably rude and slangy. They are the doctors who take up and exploit the latest fads in medicine, and consequently are the exact medical counterpart of our friends the 'progressive' politicians. . . . The essence of the business is self-advertisement, and it is effected in various ways. One is to invent a new disease caused by 'modern conditions of life'. . . . Another way is to apply modern science to revealing in a theatrical fashion the awful dangers that beset our daily life—for instance, by estimating the number of microbes that may be scraped up off the floor of a four-wheeler. . . . A less refined plan is to write signed articles on some 'progressive' medical topic in the monthly periodicals. The subjects chosen for this purpose are modern and general, such as 'City Worry' or 'Train Fag'; and maybe some innocent people are taken in by the scare. . . . But the real field of action for the progressive physician is the exploitation of new remedies and methods of treatment, or, more often, of old ones faked up and developed under new names."

PATENTS FOR MEDICINAL COMPOUNDS.

ABRIDGMENTS of specifications are now published of the following patents for medicinal compounds that have been granted:—5629 (1893) Eye lotion "composed of extract of celandine, extract of eyebright, and extract of cayenne pepper;" 6178 (1893) "A medicine for the cure of coughs, colds, hoarseness, and bronchitis, is composed of a decoction of liquorice root, Irish moss mucilage, gum arabic mucilage, glycerine, chloroform and morphine in the form of chlorodyne, syrup of squills, syrup of marsh mallow, ipecacuanha wine or antimonial wine, oil of aniseed, spirit of camphor, and benzoic acid. A medicinal lozenge or jube may be made by exposing this compound to dry warm air."

EXEMPTION FROM JURY SERVICE.

All registered pharmaceutical chemists who desire to secure exemption from jury service are reminded that it is desirable that they should ascertain that their names are not included in the list of persons liable to serve. The manner in which exemption may be secured when the name is included in the list, which is affixed to church and chapel doors on the first three Sundays in September, will be found described in the Society's Calendar for the current year.

ARSENIC OR PTOMAINES?

In a recent case at Handsworth, Birmingham, a child died and several persons were seriously ill as the result, it now appears, of poisoning by ptomaines formed in some potted meat. The first report of the analyst, Dr. MABERLY, stated that in the course of the analysis a slight trace of arsenic was found, but at the adjourned inquest it transpired that common zinc containing arsenic had been employed by the analyst instead of the pure article, the excuse given being that the examination was made on Bank Holiday, when the latter could not be obtained.

CONFERENCE PHOTOGRAPH.

THE photograph taken of the members of the British Pharmaceutical Conference and their friends, in front of Balliol College, Oxford, is a highly successful one. The grouping on the steps of the College hall proved very effective, and the portraits are more faithful than usual. Copies of the photograph may be obtained of Messrs. HILL and SALTERS, photographers, Oxford, at three shillings and sixpence each.

NEW CONSTITUENT OF THE ATMOSPHERE.

In a recent number of the *Liverpool Mercury*, J. ALFRED WANKLYN, referring to the discovery of the supposed new gas, remarks that chemists with much practical experience in carrying on analytical operations upon gases will not fail to perceive that the formation of traces of nitrous oxide, either by the action of the electric spark or of the heated magnesium, would account for everything as yet published by RAYLEIGH and RAMSAY on the subject.

THE OXFORD HANDBOOK.

A FEW copies of this work still remain on hand, and will be supplied to readers who apply for them, but they will not be sent unless the necessary stamps for postage are enclosed, according to the notice on page 76, in the Journal for July 23.

British Pharmaceutical Conference.

MEETING AT OXFORD. FIRST DAY'S PROCEEDINGS.

(Continued from p. 144).

The next paper read was on—

THE PHARMACOPEIAL INSTRUCTIONS FOR THE PREPARATION OF TINCTURES.

BY R. H. PARKER, F.C.S.

In considering the official directions for the preparation of tinctures, the instruction to "add sufficient spirit to make a pint" does not appear calculated to ensure uniformity of product under variety of manipulation: thus—if I make a pint of tinct. aurant., following the B.P. instructions, the final addition of 10 or 12 per cent. of menstruum may be required to adjust the volume of the finished product; operating on 6 pints, I can reduce the final deficiency nearly to 2 per cent.; while if I have to make 10 or more gallons, the difficulty of manipulation may increase the loss to 6 or 7 per cent. If the "making up to quantity" be omitted, the product will be of the same strength if 5 ozs. or 50 gallons be made at a time, and whether the marc be pressed in a lemon squeezer or by hydraulic power.

I would therefore suggest that in the next issue of the Pharmacopœia, all tinctures and similar preparations of about 1 in 8 strength be ordered to be prepared by maceration only, without final adjustment of quantity; those of 1 in 4 or greater strength "to be prepared by percolation, so that N fluid parts of percolate represent the activity of one part of drug." The strength of the products would thus be clearly defined, and the pharmacist might be allowed to record his own method of recovering the residue, according to the quantity of material dealt with. The "making up" is already omitted from the directions for preparing tinctures of nux vomica and cannabis indica.

The formulæ for tinct. zingiberis and tinct. camph. might be simplified; the former to be prepared by diluting the stronger tincture, and in the latter replacing opium by an equivalent of its tincture.

I think also that the footnote to the liniments of belladonna and aconite should be omitted, as a needless apology, and an aspersion on the manipulative skill of the pharmacist, there being no difficulty in preparing those liniments of 1 in 1 strength if required.

Mr. UMNEY said if he were now confronted with a paper on this subject, which he read as far back as 1870, he should be obliged to confess that he was not then up to date, and that he had learned a good deal about the manufacture of tinctures since that time. He had been much pleased with this paper, and had learned something from it, as to how far one could go in the displacement of alcohol by water. He remembered Professor Redwood in years gone by telling them that it was not possible to carry out this process under all conditions, and prevent the water mixing with the alcohol. No doubt a pharmacist operating for himself under favourable conditions, with his drugs in a proper state of powder—for percolating binged upon that—might succeed in making uniform tinctures, but he feared the process of displacing alcohol by water was rather dangerous to the final product, unless in the hands of a very experienced man like Mr. Parker. He had discarded for many years both displacement by water and hydraulic pressure. The former, if carried on by workmen or apprentices, would be sure to lead

to mixing. For many years it had been his custom to exhaust every other week 1000 lbs. of cinchona bark, and they could imagine the rate of the mixing of the spirit with water; sometimes the spirit vats only contained 30 or 40 per cent. alcohol, when there should have been 60 or 70 per cent. Of course economy of spirit was an important point to the pharmacist, especially in these days of high duties, but he preferred heat to hydraulic pressure for recovering it. He was in the habit of making tinctures on a large scale, where large quantities of marc were used, and he found the most economical process was to employ slow percolation, and recover the alcohol by heat. He found it was not possible to exhaust 1 lb. of drug without losing about $\frac{1}{4}$ lb. of alcohol in the process; for instance, in exhausting 100 lbs. of ginger, he lost 23 to 25 lbs. of spirit, 50 to 60 per cent. over-proof.

Mr. CONROY agreed with Mr. Umney. His practical experience of displacement was certainly adverse to it. No doubt in the hands of a clever expert good results might be shown; but if left in the hands of a workman, his experience was that you got a large admixture of water in the tincture. The process he preferred was hydraulic expression, supplemented by distillation. That was the only process which worked satisfactorily on a large scale. His experience, especially with belladonna, had been very unsatisfactory. The pharmacopœia process for making an alcoholic extract was to exhaust by alcohol, followed by water, and they all knew that you could hardly get two extracts of belladonna which were alike. On the whole, he did not think this process was practicable, though he felt indebted to Mr. Parker for bringing it forward.

Mr. HARDWICK thought, notwithstanding the condemnation which had been passed on Mr. Parker's method as suited for work on the large scale, there must be something in it, and that it was worthy of attention by retailers. Would there be any difficulty from the swelling of woody tissue on the addition of water, causing a block in the filter?

Mr. MARTINDALE agreed with Mr. Hardwick, especially with regard to lin. belladonna and tincture of ginger; he found an expansion occurred when he attempted to displace the spirit contained in the marc as directed. He carried out the process to some extent by displacing as far as he could, and after getting the quantity of reserved spirit for the next manufacture, watching carefully the specific gravity. The difficulty was that any mixing of the water with the spirit went on so rapidly, and the expansion of the woody fibre in the percolator was such that unless you threw off the top layer you could not sometimes get the process to go on. When it came to displacing proof tinctures, he thought it was better to follow the pharmacopœia directions, and make up the quantity afterwards, than to adopt Mr. Parker's recommendation. The same with the displacement of proof spirit by water; he thought it was far better to press it out, or where you had the convenience for it, to recover it by distillation; but he found a simple tincture press answered his purpose.

Dr. SYMES said the paper was a very interesting one, but scarcely solved the problem how tinctures could be made economically on a small scale. Still, they were much indebted to anyone who endeavoured to accomplish that, because it was very desirable that the pharmacist should make many, if not all, his own tinctures. One of the difficulties of displacement by water, in addition to the swelling of woody fibre, was that immediately water came in contact with a spirituous solution a certain amount of precipitation

occurred—some resinous matter was thrown down, which more or less filled the interstices of the marc, and practically stopped the percolation until a certain amount of it was removed. The only thing he saw for it at present was that if a man made tinctures in small quantities, he must use an extra quantity of menstruum, and if large enough in quantity, recover it by hydraulic pressure, or if he had only a small screw press, be content to lose a certain percentage of the spirituous liquid which remained in the marc, and so long as he got out the whole of the medicinal substance be content, unless he accumulated enough to justify him in distilling it. He presumed Mr. Umney and Mr. Conroy put it in a still and applied steam in some way, whilst keeping the marc well agitated, as this greatly accelerated the recovery of the spirit.

Mr. NAYLOR said he was very much afraid that the tendency amongst pharmacists was too much in the direction of economy, or to see how far 1 lb. or 1 cwt. of a given drug would go in making a particular preparation, and to be sure that the drug was completely exhausted, rather than to secure the quality of the product. He had heard with some degree of surprise that preparations were now being made on a large scale, not in accordance with the directions in the B.P.; whether those products would accord with those made strictly officially he did not pretend to say, but he knew from merely a physical examination of some of them that they were not of the standard required. He would not be surprised to find that such preparations were deficient in aroma, though he did not say they would be deficient therapeutically. Whilst a strong advocate of economical methods, he thought they were bound to loyally follow the methods prescribed in the Pharmacopœia, unless they were perfectly satisfied that the product they obtained in another way tallied precisely with that obtained by the official method.

Mr. CONROY said Mr. Naylor was entirely wrong in assuming that the two manufacturers he had named did not follow the pharmacopœia process. That process was strictly followed; as much spirit was obtained as could be by that method, and the tincture was finished, and instead of throwing away the marc, the spirit was recovered.

Mr. PERRY, after thanking Mr. Parker for his paper, said it appeared that he used a cylindrical percolator, and he should like to ask if he found any more difficulty in the use of a conical one. With regard to the recovery of spirit from *lin. belladonna*, making one gallon quantities he found it was almost impossible to recover the spirit with water. For a long time he had abandoned the use of water for the recovery of spirit from such things, and he was hoping when he saw the subject put down that Mr. Parker was going to provide them with some real method for the entire recovery of spirit. From his experience he could not bear out what had been said.

Mr. GROVES agreed with Mr. Parker that the strength of the product obtained would depend on the strength of the pressure applied. He could not understand how it was that in recovering spirit by means of water a greater quantity was obtained in the case of proof spirit than rectified spirit. One would imagine that the water would sink down and mix with the rectified spirit more easily than with the heavier proof spirit.

The PRESIDENT said he should like to offer a few remarks on this subject before asking them to thank Mr. Parker for his paper. First, because he was the pharmaceutical son of the man who more than any other introduced displacement, viz., the late Henry Deane, and, secondly, because some years ago he had the misfortune to criticise the pharmacopœia process for making tinctures in terms the mind of

which disturbed the editor of the Pharmacopœia. He still, however, adhered to the fact that the pharmacopœia process was simply disgraceful as a process of displacement. He was surprised that Mr. Parker had not mentioned anything about osmosis. There was no doubt about it that although his theory was that it was a "movement through capillary tubes where the hydrostatic and hydrodynamic effects came into operation," still you were dealing with a dry substance which was formerly in a cellular condition containing matters in solution in the cells of the plant. When you moistened that with a proper proportion of the menstruum, the cells would swell out and produce inside the cell a concentrated preparation. When you introduced the liquid after that you had the process of osmosis going on between the concentrated preparation inside and the liquid preparation outside, and you must give that time; it was a slow process, not quite the simple one indicated by this movement through capillary tubes. He should be afraid to trust himself, even, to operate with tinctures and use water for displacement, for sooner or later he should probably get into the hands of some active gentleman appointed under the Food and Drugs Act, and be told that his tinctures were not of the strength required. There was a process which obtained in old-fashioned pharmacies, where there was a row of black bottles round the top shelf in which the tinctures were macerated, and when they wanted a pint of tincture the first pint was poured off, and at subsequent intervals the second and the third. Any pharmacist who had anything to do with that process would know that as for securing a tincture which was of uniform strength, the final pint or fraction of a pint would differ very considerably from the first. If he rightly understood Mr. Parker, in making on a small scale, say, 5 drachms—though he should not recommend anyone to make tinctures on the 5 drachm scale—his method was to put the requisite quantity of drug into a bottle, to add the menstruum to it, and when you wanted a drachm pour it off, and so with the second and third drachm. He did not think that was a process which ought to be recommended or countenanced. Whether you made 4 drachms or 20 gallons, before you used a drop of the tincture it should be a finished preparation. Personally he had a great affection for the shape of percolator introduced by Mr. Deane, which was illustrated in an early number of the *Pharm. Jour.* He had recently constructed some copper ones, and if anyone would follow the directions given in early papers no tinctures which could be made would equal them. You got practically 75 per cent. of the soluble matter wholly extracted in the first 50 per cent. of the menstruum, and then when you dealt with the final quantity when dealing with a very weak menstruum, it did not materially affect the tincture whether you got out one pint less from the menstruum if you made the final quantity up to the full amount for which the ingredients were used. Altogether, while these experiments were intensely interesting, and they were deeply indebted to Mr. Parker, he did not think older men with long experience would adopt his suggestions. He hoped there was sufficient literature in existence that if a new pharmacopœia were going to be published next month a better formula than was in the B.P., or had been put before them to-day, might be adopted.

Mr. PARKER, in reply, said he should like to draw attention to the specimens he had brought with him, indicating a comparison between upward and downward displacement. He had the fifth, sixth, seventh, and eighth percolates of the two systems, showing where the line between tincture and water occurred. The third and fourth were almost colourless. The two series were almost identical, proving that upward or downward displacement made no difference in the

result if properly conducted. That proviso was rather important—the “if” came in everywhere. He might say, in answer to Mr. Martindale, the President, and Mr. Naylor, that “prepared according to the B.P.” did not guarantee the product; but that was all the statement on a good many labels. “Prepared by a careful pharmacist” would be a much greater guarantee of the product. The instructions might be followed intelligently and carefully, or otherwise, and it was plain enough that a careful pharmacist would produce a satisfactory tincture by any process he adopted. If it was not satisfactory he would be aware of it. The origin of this paper was his own process. For many years he had a suspicion of displacement by water under any conditions, but thought it was altogether too heterodox for a modern pharmacist to profess to make any use of that method in the preparation of lin. belladonna and tr. zingib. fort., where a large proportion of marc and a comparatively small amount of menstruum was employed. He always acted on three series of percolates, and first made one batch of tincture amounting to 40 ounces. When that had passed through the marc a further 40 ounces was passed through and received, and then a third. The next time he wanted to make a tincture he should pass through the ginger root first his second percolate, which would then be collected as the final product, afterwards washing it through again with successive quantities of spirit, and reserving for successive operations. That became a modified form of fractional percolation. On speaking of the matter to others he was asked whether he had ever tried displacement by water, and said no, he should not think of adding water on the top of spirit; of course the spirit would go to the top, and the water would go through first. He was informed that theory was one thing and practice another, and he would recommend that statement to Mr. Martindale. He was bold enough to try the experiment with ginger. He passed his tincture of ginger through, put water on the top, and he must say he was somewhat amazed to see that there was a line of demarcation round the percolator, indicating all through where the water was; there was always a distinct separate line gradually coming down to the bottom. Then he tried it with belladonna, with the same result. The line of demarcation showed where the water was—the water pressing the alcohol down. No water appeared at the bottom until you could see a dark line near the bottom of the percolator. That satisfied him as far as those two preparations were concerned that the process could be conducted in the simplest manner; you could always see where the water was, and the slightest observation of the drops would tell you whether it was water or tincture. Seeing that was satisfactory with two of the most important preparations one had to deal with, he thought he would try more critically to see how the matter really worked, the tables showed clearly his results. He did not commend the process indiscriminately, for at the bottom of the paper he said that good results could be produced by careful operation. He should maintain that, whatever the preparations in the Pharmacopœia were, the responsibility fell on the pharmacist to see that whenever conducted in the simplest part of the operation he was aware of the responsibility involved. So much work should be deputed to an incompetent person. Therefore any given process which required, as this did, scientific care and knowledge, should be conducted by the pharmacist himself, and that being so there was no fear of the result. How a man could get 30 per cent. of water in his percolate he could not imagine. He did not think proof spirit answered so well, and therefore he tried experiments, and the result showed

that if the marc were properly placed in the percolator—the principal point being to observe that there were no channels there—if you put the water on you could not get it below the tincture. The tincture would come out first, and the water would follow, the difference between the two being that proof spirit was not so perfectly displaced because it would more readily mix with water. In tr. zingib. 80 ounces of spirit were put through, and 80 ounces were collected before the water appeared. If you put two drops on a plate, one rectified spirit, and one water, and made them touch, they did not mix so readily as a drop of proof spirit by the side of water. It was the partial dilution with water which made it mix more readily with water. In the same way a drop of strong sulphuric acid would not mix so readily with a drop of water as a drop of dilute acid. The danger in displacement by water only existed when worked by those not sufficiently aware of the conditions which had to be observed. It was plain enough to anybody that if there were a tubular hole through the whole distance of the marc, and you poured water on the top, the water would run straight through, and so if the marc were packed so that there was a channel of any kind the water would run through before the tincture, but if the marc were packed carefully, so that there were no air channels or spaces, the water was bound to drive out the whole of the spirit. An examination of the actual details of the tables would show the precision with which the percolate came out; the only difference was in the fourth place of decimals, that not only with rectified but with proof spirit. He had demonstrated that in four or five proof spirit preparations, but he did not recommend the process for proof spirit tinctures generally. The loss was generally considerable; in tr. cinchona co. he recovered 75 per cent. out of 80. He should be pleased to hand Mr. Naylor a specimen of the tr. rhei, and ask him to get half-a-dozen other specimens and compare them. The crucial point of Mr. Naylor's criticism rested primarily on a misunderstanding of both Mr. Umney and Mr. Conroy, and he could not imagine how he fell into the error. It was perfectly clear to him that on the manufacturing scale, which those gentlemen referred to, the finished perfect tincture was first made, and the matter of applying heat for distillation was simply for the recovery of waste spirit from the marc. Great stress had been laid on the importance of following the B.P. instructions, but in his opinion it was not so much following the instructions as following them intelligently—it was not the following but the intelligence which made the variation in the result. He maintained that if you had four pints of tr. rhei to make, the most perfect system of getting a uniform product under twenty different manipulations would be to put the whole of the ingredients, including the menstruum, into a bottle and shake it up until no more could be extracted. Samples then taken from the whole would be fairly equal, whereas taking twenty different manipulators and telling them to follow the B.P. process, macerating with three-quarters of the menstruum, following with the fourth quarter, then pressing the marc and making up afterwards, would leave a very wide margin for variation in consequence of the amount which was wasted in the process. That would reply to the President's criticism on his making of 5 drachms. As he was placed he had no call for tincture of saffron, and if he had a prescription containing one drachm he should certainly not make a pint of tincture of saffron for that purpose. If the pharmaceutical process for making one pint were simply to put sufficient spirit into a bottle, and shake for two days, and pour off what was wanted, the product must be uniform. Then he could make his 5 drachms, put it into a bottle, shake up, and

have one drachm if necessary, and that one drachm would be as perfect as if 50 gallons had been made, which would not be so if they attempted to follow the B.P. instructions with so small a quantity. The use of the whole menstruum had the advantage that the first portion collected might be used at once. The displacement by water was slow, and in some cases required several days for completion, but if complete extraction were carried out, the first percolate would be nearly the same as the last. Mr Hardwick had referred to the swelling of the tissues, which no doubt occurred in many drugs, but there was no difficulty in that particular if a slightly conical percolator were used. The swelling would take place in a vertical direction, and did not interfere with the process. In the displacement of belladonna or ginger the precipitation of resinous matter was easily met by slightly stirring the aqueous portion in the upper part. The shape of the percolator was not a matter of importance. In looking over papers connected with this subject he came across one in which a percolator was shown of the shape of an ordinary funnel with an angle of 45 degrees to the side, which was stated to produce better results than a cylindrical percolator. Another worker showed that he produced much better results by a cylindrical than by a conical shape. The only conclusion was that it depended more on the manipulation than the shape. In large operations a cylindrical percolator would be serviceable, but in small quantities a slight conical one was better. The President asked why he did not refer to osmosis. He took it that osmosis in this case would be more of the character of diffusion. There would, of course, be osmosis, since the tissues of the plant would be filled, so to speak, with the menstruum, and the water had to pour through the tissues to get in. He did not take it separately because the point of diffusion was referred to, and the table for tincture of ginger showed that diffusion or osmosis took place to practically no extent. Although in that case the two fluids were in contact passing through the marc during sixteen days, the diffusion or osmosis which took place was practically nil. The 80 ounces of spirit passed through, and the water came immediately afterwards, there only being about 5 ounces difference between the two. As he had before said, he did not recommend this process for proof spirit preparations, but in the preparation of rectified spirit compounds, especially those of a resinous character, it was most applicable for small manufacturers; of course it did not touch the large ones. No doubt it was practicable on the large scale, but for from one to four pints it was most decidedly economical. At the same time he undertook to prove that the strength of the tincture or liniment was equal to that produced by any other process, and better than that produced by the actual pharmacopœia process, if only carried out as it should be. It was easy to say fill the percolator till half of the strength was left behind, but that could not be done in the way he described. First the belladonna was steeped in the percolator with spirit, the spirit passed through and through for several days, never allowing it to pass out of the marc. Then, after having percolated for several days, you might guarantee the spirit had taken up all it possibly could; finally if you allowed it to drain, and pressed out all that would come out, you would produce a better liniment than by any other process.

The President, while congratulating Mr. Parker on his spirited reply, said he must be allowed to say, though he did not wish to re-open the discussion, that there were several fallacies in his statements.

The Conference then adjourned for the day.

SECOND DAY'S PROCEEDINGS.

On Wednesday, August 1, the Sessions of Conference were resumed at 10 a.m. The following was the first paper read:—

LABORATORY NOTES.

BY F. C. J. BIRD.

Potassium Stearate in Turpentine Liniments.

The compounds of stearic acid with the alkali metals possess in a high degree the property of forming gelatinous solutions with water, the presence of a very small proportion of dissolved stearic soap being sufficient to render a liquid almost solid. It was thought that this might be turned to account in the preparation of a liniment containing turpentine and ammonia as its chief constituents, which, after repeated trials with *sapo mollis*, had proved unsatisfactory, and had invariably separated. Potassium stearate in solution was at first used, but with little success. When, however, stearic acid was dissolved in the turpentine, and the mixture of ammonia and distilled water added, agitation instantly produced a milk-white emulsion of admirable consistence, and showing no tendency to separate. In this case the large excess of ammonia exerted no disturbing influence, but appeared rather to increase the emulsive power of the stearate. The proportion of stearic acid necessary for a given quantity of turpentine varies from 1 to 2 per cent., according to the amount of water present, increased water requiring a larger proportion of stearic acid. The acid should be melted on a water-bath, a little turpentine added, the mixture warmed till clear, and then poured into the remainder of the turpentine.

The same process may be applied to the preparation of lin. *terebinth.*, B.P., the formula for which would stand as follows:—

Lin. Terebinthina.

Oil of Turpentine	16 fl. oz.
Camphor	1 fl. oz.
Stearic Acid	80 grains.
Solution of Potash ..	$\frac{1}{2}$ fl. oz.
Distilled Water	$1\frac{1}{2}$ fl. oz.

Melt the stearic acid with a little of the turpentine on a waterbath, and add to the remainder in which the camphor has been previously dissolved. Mix the solution of potash and distilled water in a bottle of sufficient capacity, add the turpentine solution, and shake vigorously for a few seconds. The result of this formula is a milk-white liniment which is always of uniform consistence and does not separate. The advantage of employing definite materials, as *liqueur potasse* and stearic acid, in place of the *sapo mollis* of the present official formula, with its varying percentage of water and free alkali, is obvious, ensuring as it does a liniment which is always of uniform consistence and appearance. The small quantity of stearic soap required to effect the emulsification of the turpentine, and the ease and rapidity with which the liniment can be prepared, are additional points in favour of this formula. One grain of stearic acid requires about 3 minims of liq. potasse for neutralisation. This corresponds to the formation of the neutral potassium stearate, and is the proportion which succeeds best with oil terebinthina.

It has been shown that with the official process, slight variations in manipulation, even with the same materials, will produce widely differing results, but working in several different ways with stearic soap, I have not succeeded in altering the character of the liniment.

Distilled Water.

The quality of the distilled water used in pharmacy has from time to time given rise to much discussion, which, at all events, has had the effect of drawing

attention to the very unsatisfactory condition in which this article is often met with. Distilled water containing ammonia is very prone to develop fungoid growths, and there are many apparently obscure cases of fermentation and decomposition causing much trouble and loss which may be traced to the presence of fermentative bacteria and fungoid germs as impurities in the distilled water. The subject merits more attention than it usually receives, as organic matter of this description is almost more objectionable for many pharmaceutical purposes than inorganic salts.

A still of large capacity was formerly necessary to furnish sufficient distilled water for average requirements, but the small stills on the continuous principle, which have of late years been placed on the market, are far more convenient in use, and need but little attention. Evidently, in a continuous still, the first portion of the distillate cannot be rejected, and the product will always contain ammonia, unless an acid be placed in the still to retain it. To effect this, and at the same time destroy organic matter and nitrites, various substances have been proposed, such as alum and potassium permanganate, sulphuric acid, phosphoric acid, potash and permanganate of potash, and permanganate acidified with sulphuric acid. This last combination is the most effective with a second-rate water, but the distillate always acquires a peculiar odour, which for certain purposes is objectionable. With the view of avoiding this odour if possible, I tried the substitution of potassium bichromate for the permanganate, and obtained a distillate which was odourless and answered the pharmacopoeia tests. Suitable proportions for use in a continuous still are 10 grains of bichromate and 6 fluid drachms of sulphuric acid for each gallon of the still's capacity. With water from the London mains, sulphuric acid alone, or even oxalic acid, will furnish a very pure water, which, if properly kept, never becomes cloudy or develops fungoid growths.

A microscopical examination of samples of distilled water containing fungoid growths will also show small particles of vegetable tissue, introduced as dust, which have formed nuclei for the growth of bacteria. The appearance of fungi in distilled water is generally attributed to ammonia in solution, but they probably quite as often rise from the fragments of vegetable debris, always to be found in the dust of a pharmacy, which form a weak infusion very favourable to their development.

A useful form of vessel for the storage of distilled water consists of a large glass bottle with a stoneware tap and narrow neck, the latter being plugged with cotton wool and surmounted by a loosely-fitting tin cap. Storage tanks constructed on this principle preserve their contents in a perfectly sweet and clear condition, however warm and unfavourable the situation in which they may be placed.

Syrup. Hypophosph. Co., B.P.C.

It is a well-known fact that syrupus hypophosph., when made according to the formula of the B.P.C., sometimes develop a sulphuretted odour. Various reasons have been assigned for this, such as the use of sugar bleached with sulphurous acid or faced with pyramine, and the presence of sulphuric acid or phosphates which become reduced by the free hypophosphorous acid in the syrup. Certain it is that all the common sugars (especially beetroot) will develop a disagreeable odour, and it is only safe to employ pure sugar which has neither been bleached nor artificially coloured.

A sample of this syrup came under my notice some time ago, which, although prepared with pure sugar and a solution of hypophosphite of iron free from

sulphate, still possessed a disagreeable smell. On testing the syrup an excess of sulphates was found to be present, and an examination of the other ingredients revealed the fact that the hypophosphites of calcium, manganese, and potash all contained sulphate as an impurity. I have not yet found a commercial sample of either calcium or manganese hypophosphite entirely free from sulphate; many specimens contain a considerable quantity. Evidently very pure salts must be used, or the alternative, and perhaps more convenient, plan may be adopted of dissolving the hypophosphites of calcium, manganese, and potash in the iron, quinine, and strychnine solution, and before proceeding further with the formula precipitating the sulphate by the careful addition of a strong solution of barium hypophosphite.

Repercolation as a B.P. process.

The process of repercolation, although a favourite one in American practice, and used to a fairly large extent on the manufacturing scale in this country, has not as yet obtained official recognition. This has been doubtless due, not to any want of appreciation of pharmaceutical progress by the compilers of our national pharmacopoeia, but to a laudable disinclination on their part to give authority to any new process until extended trial had proved its superiority over present methods. The time has now arrived, I think, when the question of its adoption should receive careful consideration, as it may be applied with advantage in two at least of the formulæ of the British Pharmacopoeia, viz., ext. cocæ liquid. and podophylli resina.

As a general process it has disadvantages which are not as a rule put forward very prominently by its advocates. The chief of these is the necessity of storing a large number of weak fractions or percolates. This may be of no moment in a manufacturing house where fluid extracts are constantly in progress, but it becomes a matter of consequence to the small pharmacist, who may make such extracts at infrequent intervals, and who does not wish to add an accumulation of unfinished preparations to his already overburdened shelves.

The ordinary official process, carefully conducted, is, in my opinion, preferable for working many drugs on the small scale, but when dealing with considerable quantities, repercolation is superior in economy, and frequently in excellence of product. With respect to the two formulæ mentioned, it presents distinct advantages. The official formula for ext. cocæ liquid. directs the powdered leaves to be percolated with proof spirit until exhausted, the first portion of the percolate reserved, the spirit distilled from the remainder, and the residue evaporated to a soft extract, which is to be dissolved in the reserved portion, sufficient proof spirit being added to make the product up to the required volume. As prepared in this manner the extract, although brownish green when first made, gradually loses its green hue and throws down a heavy deposit. This may be attributed to a partial alteration of the constituents of the leaves by the heat of distillation, and possibly to a little water introduced with the soft extract when dissolved in the reserved percolate. Either alcohol or water, even in small proportion, precipitates ext. cocæ liq., so that if the alcoholic strength be disturbed, deposition may be expected. The change in colour is accompanied by an alteration in the behaviour of the extract when diluted with water, a want of uniformity most undesirable in a pharmaceutical preparation.

When the same extract is made by repercolation no deposit is thrown down, even after many months keeping, and this alone should prove a strong recommendation in favour of the process. Comparing the two methods, the most noticeable difference is in the specific

gravity of the product, which in the B.P. process generally comes out somewhat higher, the average being about 1.010 as against 1.004 by reprecipitation. But as the former deposits on keeping this difference is not important.

The details of the process which I have found to work well in practice may be of interest. Six percolators are a convenient number to use, although it is quite possible to work with four. The powdered drug is divided into as many equal parts as there are percolators, and supposing 6 lbs. to be the quantity operated on, 1 lb. is uniformly moistened with 16 fluid ounces of proof spirit and passed through a moderately coarse sieve. The orifice of the percolator having been plugged with cotton-wool, and a layer of clean silver sand placed upon it, the moistened drug is introduced, and a sufficiency of proof spirit poured on to saturate the marc and leave a stratum of liquid above it. The whole having been allowed to macerate during twelve hours, percolation is allowed to proceed slowly. The first 16 fluid ounces of percolate are collected separately and used to moisten the second lb. of coca leaves. This operation is repeated for each percolator, until the first 16 ozs. of percolate attains a specific gravity somewhat higher than that of the finished product. For coca this would be about 1.010, and is generally reached when the extract has passed through about the third or fourth percolator. This percolate is set aside, the second 16 fluid ounces being used to moisten the drug for the next percolator, and the same procedure is followed for the remaining percolators. From the last one sufficient percolate is collected to make with the percolates already reserved 92 fluid ounces in all, and afterwards as many fractions of 16 ozs. each as may be necessary to completely exhaust the drug. An allowance of 4 fluid ounces is made in the product to compensate for the extract in the weak percolates collected for a subsequent operation. When starting with weak percolates in hand, the strongest is used to moisten the contents of the first percolator, and the others poured on in succession; in this case the full quantity of product is obtained.

The process for podophylli resina is another in which the avoidance of heat is undoubtedly advantageous. Much has been written on the deviation of the podophyllum resins of commerce from the B.P. characters and tests, and although this has been shown to be due in many instances to adulteration, and in others to the employment of different processes, it has also been stated that the B.P. requirements are too exacting, and that it is very difficult to obtain a resin answering the B.P. tests by the official method. With this latter statement I entirely agree. An examination of a number of commercial samples certainly gives one the idea that manufacturers experience some difficulty in the matter, for it is quite the exception to find a sample which is completely soluble in rectified spirit and in ammonia. Many form a clear solution with ammonia, and only partially dissolve in rectified spirit; I have also met with samples labelled "British Pharmacopoeia," which dissolved in spirit, but left a flocculent residue when treated with ammonia.

The process of the pharmacopoeia when modified by substituting reprecipitation for the present method of preparing a tincture and removing the alcohol by distillation, yields a product which is completely soluble in rectified spirit, in solution of ammonia, and in aromatic spirit of ammonia. The podophyllum rhizome should be in No. 80 powder, and a fluid extract prepared from it of a strength equalling two parts of the drug in one fluid part of the extract. This, having been rendered perfectly clear by decantation or filtering, should be poured into three times its volume of ice-cold water, the remaining directions being followed as

they stand. 100° F. is a suitable temperature at which to dry the resin.

A sample prepared in accordance with the above answered the B.P. requirements in every particular. The colour of the resin was yellowish, with a faint tinge of green; and the yield $3\frac{1}{2}$ ozs. from 5 lbs. of rhizome, equal to about 4.3 per cent.

Mr. JOSEPH INCE said it was very desirable to have a process which would give uniform results in the case of liniments, and if the one recommended would do so it would be a considerable advantage. With regard to the preparation of emulsions and the two liniments mentioned which strictly came under that heading, it was known to every pharmacist that the formula for an emulsion went for comparatively very little in the light of its ultimate success, and that manipulation was equally important with the formula itself. It depended quite as much on tact and delicacy of manipulation as on the formula, and it would, therefore, be a great advantage if any method could be introduced which would avoid that uncertainty, and secure the getting of these preparations in a uniform condition. All these soap liniments depended on the emulsion being prepared by means of soap as a basis, and it literally depended on the operator what turned out. Two experienced manipulators might stand side by side with the same ingredients, and the two would produce emulsions of a totally different character—one would be gelatinous and the other much more fluid. If there were sufficient skill in the operator the present formula would answer very well, but after all it was the dispenser to whom was due the excellence of the preparation. With regard to the small still in continuous action, he did not think many pharmacists were aware of its great advantages. Many were under the impression that if they wanted anything in appreciable quantity they must have a large apparatus, but there were excellent stills now which worked remarkably well, and comparatively large results might be obtained by the continuous process, particularly in the case of distilled water. In his own small practice, for educational purposes, he had a small still with the continuous process, and by the addition of a little sulphuric acid he produced a distilled water which was all that could be desired.

Mr. JONES said he was particularly interested in the sample of emulsion of turpentine, because he believed this process could be put into a number of hands, and would give a uniform result. He showed some years ago at the Midland Counties Association, that an almost precisely similar emulsion could be made by using oleic acid, and the formula would be found in one of the Year Books. The only difference here was that Mr. Bird used stearic acid, which certainly had the advantage that it could be had in a greater state of purity to start with. At that time he tried various brands of oleic acid, and found practically there was no difference between a very cheap article and that sold as pure oleic acid, so that he was prepared to admit that stearic might have an advantage. He should like to ask whether the emulsion was perfectly inseparable? His emulsion was practically inseparable, but not really so, because after being kept for a month it would show a thin milky layer at the bottom, though a perfect emulsion might be easily formed by shaking. If Mr. Bird's emulsion showed no separation at all in a month the process might be looked upon as being as near perfection as could be expected.

Mr. LINFORD said he had worked the process published by Mr. Jones, and by carefully testing the amount of potash necessary to saturate the oleic acid before making it, it made a perfectly inseparable

liniment, which he had had standing for six months. With regard to repercolation, for the last ten years he had had a series of stoneware cylinders fitted at the bottom with a bung, a glass tube, and a screw clip. He had made a great many preparations, especially with coca, by making a fine powder, stopping the bottom with fine cotton wool and sand, and regulating the flow to about ten drops a minute. Passing the whole through six percolators, one after the other, he found it answer very well. He had a shelf above with holes in, and all that went through the first percolator was passed into a bottle with a glass tube from it, which just dipped into the fluid in the second one, so that it was going on constantly day and night. Very many substances he had tried in that way he had found to be almost absolutely exhausted, even in the second percolate. He had used the process also for fluid extract of ipecacuanha, and for several concentrated infusions, notably those which depended on the aroma of the drugs, and found it much superior to any other method. This was the result of ten years' experience.

Dr. SYMES said with reference to the syrup of hypophosphites his experience showed that the unpleasant odour developed was almost entirely due to the colouring matter, ultramarine, used by sugar refiners to cover the slight yellow tinge of refined sugar. Sugar should be used in which this colour was avoided altogether; it could be easily tested by making a small quantity of solution and putting it on a filter, when the blue deposit would appear on the surface if it were present. By avoiding that, you avoided the chances of the decomposition he referred to, and were able to see what quality of sugar you had. The more imperfectly refined sugar always had the largest quantity of blue.

Mr. TYLER said he could emphasise the remarks of Dr. Symes. He had had a good deal of experience, and had learnt much from the criticisms of pharmacists. Few had any idea of what the difficulties were in the manufacture of hypophosphites. Anybody who read the text-books, particularly Professor Atkild's, would find a description of the process there which was justified by the formula and the equation, but all he could say was that the equation did not represent what went on. The sulphates appeared from two or three sources. First there was the fact that the phosphorus always contained a little sulphur, and the same as a commercial article contained always more or less sulphate. The water used was not even the product distilled water, for there was not enough of it in the place where a good deal of the hypophosphites were made. The volume of liquid required, including the necessary decomposition and dissolving, re-dissolving and re-crystallising, involved many thousands of gallons relatively to the weight of material, so that there were possibilities of sulphates here which could not be easily managed. Nevertheless, the fact remained that occasionally a syrup of hypophosphites made by even the best manufacturers were complained of on this account, and as it was a serious matter to have such complaints, he had made it a matter of very careful investigation. He could confirm what Dr. Symes had said, that Mr. Bird's solution of the difficulty was the one. With regard to the sulphates and the suggestion Mr. Bird made with regard to barium hypophosphite, it was common-sense itself, but he would draw the attention of gentlemen testing for sulphates to the question of the solubility of barium sulphate in these solutions. Young chemists especially were under the impression that barium was one of the easiest things to get out of solutions, but let them try to get it out of a solution of hypophosphites. He had never been able in a solution of hypophosphites even moderately dilute to

get the exact point at which the barium was just enough to remove the solvent. When you removed the solvent the next complaint was you had a tangible quantity of barium. Some operators objected to the slightest trace of barium as much as to the smallest traces of sulphate. He did not say it was impossible to get them out, but under ordinary manufacturing conditions on a large scale it was a difficulty which skill, science, and experience alone could solve. His advice was—Beware of the sugar!

Mr. UMNEY desired to thank Mr. Bird for bringing forward this matter of the compound syrup of hypophosphites, because it was considered necessary to overhaul the formula which had been published, which was not as perfect as it might be. Mr. TYLER, as a manufacturer of hypophosphites, spoke with authority, but he had not learnt much from him, and, with reference to what Dr. Symes said, strange to say, he went to Liverpool for his sugar and bought unblued sugar warranted made from cane, and yet he got the odour complained of. Dr. Symes might shake his head, but he had constant complaints that this syrup smelt of sulphuretted hydrogen, or whatever it might be. He had, therefore, no doubt whatever that it was not due to the sugar, and was rather inclined to think that it was more due to some impurity in the hypophosphites. He hoped his colleagues on the Formulary Committee would see if they could not improve on the process. As to the question of repercolation, it was an old fad in pharmacy. Twenty-five years ago he recommended repercolation of cinchona bark; one could start with water and get to a gravity of 1.050 at the end with repercolation.

Mr. LINFORD said that during the last seven or eight years he had made considerable quantities of syrup of hypophosphites. He always made the solution separately, mixing it with the syrup as required. He had never had any odour from the solution, even when kept a considerable time. He always used sugar he could warrant free from blue of any sort, generally Martineau's English made.

Mr. CONROY said he could confirm what had fallen from Mr. Umney. Probably the sugar he used was the same, and was absolutely free from blue colour, but he must say, although they made syrup from that sugar which was made specially for the purpose, still they got this odour. He could only attribute it to the hypophosphites themselves. He could confirm what Mr. Bird said, and he did not think it was at all due to the sugar.

Mr. PARKER said this seemed to be a game of shuttlecock and battledore between the ultramarine of the sugar and the impurities in the form of sulphates. The probability was that both of these sources produced sulphuretted hydrogen, but his own opinion was that the great bulk of the danger remained in the sugar. There might be danger from sulphates among the hypophosphites, but if you steered clear of sulphur in the sugar you got rid of a great deal of the difficulty. He had found himself, from experience of sulphuretted syrup, that since he had used the purest sugar he could buy he had never had a sample which had this unpleasant odour, although in preparing a chemical solution he always erred on the side of having a trace of sulphuric acid left rather than any barium.

Mr. GERRARD thanked Mr. Bird for having got rid of many difficulties. Liniment of turpentine had always been a worry to the student, to the examiner, and even to the experienced pharmacist, the difficulty being that the soap was so variable. He had here given something definite, stearic acid and solution of potash, both definite bodies, and by the use of them they were likely to get definite results. He hoped the preparation kept well in the condition of emulsion, though he would not go so far as to say that it should

be condemned on account of a slight separation. The present preparations were by no means satisfactory, and if this were found to be what it was represented he had no doubt it would be introduced into the next British Pharmacopœia. The liquid extract of coca had recently given him a certain amount of anxiety. He had a prescription to dispense containing it, and it was noticed that it contained a considerable amount of precipitate. Of course it was sent out with the usual "shake the bottle" label, but shortly afterwards brought back with the whole of the chlorophyll adhering strongly to the sides of the bottle. It was suggested that something was wrong either with the dispensing or the prescribing, but it was soon found out that there was nothing particularly faulty with either. One could not tell exactly what was going to happen in a new combination, but on repeating the prescription again with a fresh preparation it gave precisely the same result. If they could get rid of this colouring matter from any of the extracts it would be a great advantage; they did not want it there, it was useless and nasty, and gave rise to complaints. Perhaps in this liquid extract of coca there might be some difficulty from the use of heat, and if they could get a watery extract without the employment of heat it would have advantages over one prepared with proof spirit.

Mr. PERRY said there was one drug to which the process of repercolation could be adapted by retail pharmacists, viz., senna. Dr. Clarke called attention to it some years ago, and he had been in the habit of preparing it by repercolation, and got a very admirable product. The leaves were readily exhausted, and he would refer members to Dr. Clarke's paper.

Mr. BIRD, in reply, said he was well acquainted with Mr. Jones's process for making turpentine liniment with oleic acid, which was a very admirable one, but in his experience he found it separate. It might be due to want of adjustment between the quantity of liquid potash and oleic acid. But with stearic acid any quantity between 20 to 30 of liquid potash to 10 of stearic acid would be satisfactory. There were two stearates, an acid, and a neutral. As to the syrup of hypophosphites, he was of opinion that both sugar and sulphates were the cause of the sulphuretted hydrogen odour. He might add with reference to the liniment, that it did not separate in the least, being kept for three weeks, which was as long as his experience extended over.

The following paper was next read:—

NOTE ON EXTRACT OF MALT WITH COD LIVER OIL.

BY HY. WILLIAMS JONES, F.O.S.

Extract of malt with cod liver oil is popularly supposed to contain as much oil as an ordinary emulsion, that is, half its bulk.

To ascertain how far certain advertised preparations conformed to that standard, I selected four well-known brands, which I judged to have the largest sale.

The method of assay was as follows:—Five grammes was dissolved in 50 C.c. of water, placed in a stoppered glass separator, and 50 C.c. of ether added. After standing till the ether containing the dissolved oil had separated, the entire upper layer with flocculent matter (a small quantity of emulsified ether and extract) was separated from the clear layer of malt solution. The latter was washed with 25 C.c. of ether, and the combined ethereal solutions allowed to evaporate spontaneously in a glass dish with upright sides. The residue was redissolved in ether, to separate the small amount of extract, dried in a water-oven after evaporation, and finally weighed.

The following table gives the percentages obtained.

The amount by volume being calculated from the percentages by weight, the specific gravity of the samples, and of average cod liver oil:—

Percentage by weight.	Percentage by volume.	Consistency.
A.....22.76	29.5	Semi-fluid
B.....17.82	24.0	Thick
C.....14.48	20.1	"
D.....1.38	2.0	"

Samples made with 50 per cent. by volume would obviously compete unfavourably with those brands containing less oil, and would have a tendency to show greater rancidity, if not actual separation of oil. As a matter of fact, I know an instance where sample "D" was selected for continued use, as it was regarded as the most palatable preparation which could be procured.

Mr. ALCOCK asked if Mr. Jones could give the origin of these things more definitely. It was highly probable that the sample was a small quantity of oil, come from what they knew as "stores," and that were the fact, it would be well that the work should know how pharmacists had to compete against the most dishonest practices. With regard to the process, he would ask if he succeeded in separating the flocculent portion from the ethereal layer? He found in the analyses of these emulsions that the Berner Schmidt method adapted for the examination of milks for fat was very useful for emulsions. It was very difficult sometimes to get the whole of the oil from the flocculent layer.

Mr. UMNEY said he hoped, when he saw this matter was coming before the Conference, that they would have a little light thrown on the subject, but, unfortunately, Mr. Jones seemed to have dropped the matter when he ought to have gone on. He showed the great variation in trade samples, which was to be expected, inasmuch as there was no authorised formula for their preparation, but that was all. It was quite clear that this matter should be taken up by the Formulary Committee, and that they should decide whether a 10, 20, 30, 40, or 50 per cent. mixture of these substances was desirable. If Mr. Jones had made experiments in that direction, as said that in his opinion a 10 or 20 per cent. mixture was desirable, they would have had some real information. He had seen considerable quantities of this extract prepared. It could be made by two methods; first, by mixing oil with the extract by mechanical means, and, secondly, by using some body as pure gum arabic, and there again he hoped Mr. Jones would have given them the benefit of some experiment as to which method was the most desirable for preparing this body, which was not an emulsion, strictly speaking. The public liked it, and evidently believed they obtained benefit from the mixture of these two substances, one being a good feeding substance and the other a valuable medicine, and therefore the sooner the Formulary Committee decided what the strength of the mixture should be and how it should be made, the better. He must say he was horrified to find there should be such a dilution as 1.2 per cent. in one case, and in another 25 to 1 per cent. His own idea was that the bulk of the extract contained between 10 and 20 per cent. of cod liver oil.

Mr. CONROY agreed that the Formulary Committee should take up this matter. His impression had been that cod liver oil and malt contained 20 to 25 per cent. of oil. Many years ago it was made containing as much as 50 per cent., but that was never obtained now.

as far as he knew. As generally sent out by the whole-sale trade it contained 25 per cent.

The PRESIDENT said he agreed with what had been said, that Mr. Jones had stopped short at the most interesting point, and he hoped he would continue his researches. It was important to know, with all advertised preparations which were sold pretending to be something or other, what their constitution was. Even when analyses were published in the medical journals, and copies were affixed to the vessel or pot, stating they contained this or that, they were often delusive. It had been his experience that a preparation bearing a label stating that it contained 15 per cent. of moisture, on analysis proved to contain 30 per cent., so that it was not at all peculiar to malt and cod liver oil. The same principle ran through the whole gamut of advertised nostrums, and as medical men seemed to prescribe these nostrums for their patients, they certainly did want formulae on a scientific basis, and he had no doubt the Formulary Committee would take notice of it.

Mr. JONES, in reply, said he had made some experiments, but was not yet in a position to say how one could mix 50 per cent. of oil and get a preparation which would keep for six or nine months, because some people would keep it for a long time. With regard to the proportions, he should prefer, if possible, 50 per cent. On the Blue List there was formerly the question with reference to malt extract itself: Why did it go solid? but he supposed everybody knew now, as it did not appear on the list. The method recommended by Mr. Alcock was very good for separating fat, but he found the best way was to divide it into two parts, first to allow the ethereal layer to separate completely, which in some cases took two days, and run off the lower layer through the stopcock. Then run off the entire ether and the entire flocculent layer, evaporate the whole down, and redissolve. By that method there was no chance of leaving anything behind, or getting anything out that was not there. With regard to mixing by mechanical means, he remembered reading in one of the journals an answer to a correspondent. "You cannot expect to make a very fine cod liver oil and malt preparation; you cannot compete with what you buy, because the manufacturers spend thousands of pounds on having the most perfect mechanical mixers." He did not think that was required at all and knew you could make it with any common pestle and mortar if you had the malt extract of the right consistency and ordinary oil. You could make a 50 per cent. emulsion, but it would not keep, and he did not believe an expensive apparatus would make it keep any better.

The next paper was on—

THE KEEPING QUALITIES OF CERTAIN SAMPLES OF SPIRIT OF NITROUS ETHER.

BY HY. WILLIAMS JONES, F.C.S.

The rapid deterioration of spirit of nitrous ether under ordinary conditions of everyday use is well-known, and has been commented upon by a number of observers.

To test the keeping qualities, under specially good conditions, I set aside a number of samples in January and February last year (1893). The stoppers of the bottles were luted down, tied over with leather, and placed in a cool cellar, where they remained undisturbed until they were finally examined.

The loss of ethyl nitrite was considerably less than anticipated, and is shown in a tabular form. Column gives the number of C.c. of nitric oxide yielded by C.c. of the spirit when received, and column II. the yield of gas after keeping for the time specified.

Since testing my samples I find that similar, though not quite identical, results have been recorded in the last (1894) edition of Squire's 'Companion to the British Pharmacopœia.'

The editors of that volume say: "Dymond (*Ph. J.*, xix., 467) states that nitrite of ethyl in rectified spirit decomposes from there being so much water in it, and that this is likely to account for loss of strength on keeping. Our experience scarcely agrees with this. When evaporation is prevented we do not find the loss to exceed 6 per cent. (32 C.c. of gas from 5 C.c. reduced to 30 C.c.) in a month, and believe evaporation to be the chief cause of deterioration."

Now, however true it may be that the loss of ethyl nitrite is mainly due to evaporation, a distinct loss, in all probability due to the water present, is observable in all cases; and a very notable change is apparent in the only sample (No. 9) amongst those procured, which exceeded the limit of specific gravity given by the British Pharmacopœia.

TABLE OF RESULTS.

	Sp.Gr.	I.	II.	Time of Keeping.	
1	8400	41.0	39.5	15 months	Solution of ethyl nitrite Made from "B.P." quantity of materials Trade sample
2	8893	41.0	34.0	15 "	
3	8414	39.0	37.0	14 "	
4	8891	39.0	33.5	14 "	Made from "purchased liquor, 17 Trade sample
5	8879	38.0	33.5	15 "	
6	8449	37.5	31.5	14 "	
7	8480	37.0	31.5	14 "	" "
8	8437	36.0	28.0	15 "	" "
9	8477	36.0	14.5	15 "	" "
10	8884	38.0	31.5	14 "	" "

Mr. GROVES said if Mr. Jones could give them some idea how to keep nitrous ether without deteriorating, they would thank him very much. They all knew this spirit was liable to deterioration, partly owing to evaporation, and partly to temperature. He presumed the bottle was practically full, so that the contact with air was prevented.

Mr. SIMPSON said his experience was that if this substance were kept in stoneware bottles at a low temperature, or in coloured or black bottles, it was less liable to change than in ordinary white bottles.

Mr. SPILSBY said he had kept some samples for a considerable time, except that instead of being the spirit of nitrous ether of the British Pharmacopœia, it was an ethyl nitrite prepared by a process modified somewhat from Duncan's. Samples were prepared in February, 1893, and the results of testing, though not very systematically, were very satisfactory. He tested it in November or December, after it had been frequently opened, and the bottle was only half filled, and it then gave 30 volumes of gas from 5 C.c. The samples were stored in a similar condition to Mr. Jones's, in a light cellar with no direct sunlight. Additional precaution might be taken by those storing the spirit by smearing the stopper with a mixture of hard and soft paraffin of about 3 to 1, which greatly prevented the diffusion of gas through the stopper.

Mr. UMNEY said the father of the pharmacopœia process was the late Professor Redwood, and most of them at Bloomsbury Square had heard him harangue over and over again on the merits of spirit of nitre. He always contended that it was not ethyl nitrite alone which was the medicinal agent in spirits of nitre, but that aldehyde and other bodies were equal medicinal factors. Unfortunately, Professor Redwood was gone from them, and since his

* The only sample met with below "B.P." sp. g

death they had had the researches of a very eminent therapist, Professor Leech, who had shown, without any doubt, that the medicinal property was due to ethyl nitrite. Now came the question how long were they going to continue the old-fashioned pharmacy of the 1746 pharmacopœia, and whether they should not in the next one put a definite solution of ethyl nitrite which could be made of a definite strength. He could not say the preparation would keep, because it was as natural for ethyl nitrite to decompose as it was for iron to rust. The pharmacopœia recognised that, as it gave a maximum and minimum strength. It was hopeless to expect to get a spirit of nitre which should be definite in composition at all times. If they could not discard the old preparation, at any rate they might have a new one side by side with it.

Mr. LINFORD said he made spirit of nitre some time ago by the ethyl nitrite process, but constantly had it returned, as it was not the spirit of nitre people were used to.

Mr. WRIGHT said there was a very good reason for the complaints Mr. Linford said his firm had had from time to time. He was quite sure that if any pharmacist who had been in the habit of selling the old-fashioned sweet spirit of nitre laid in a stock of spirit made according to the pharmacopœia, he would soon have some of it returned on his hands with similar complaints. They were all aware of the fact that sweet spirit of nitre was employed very largely for domestic purposes, and amongst other things for producing a diaphoretic effect, and, according to his experience, when the spirit made from ethyl nitrite according to the 1867 and 1885 pharmacopœias had been sent out, they had been met with the complaint that it failed to produce that distinct effect which was certainly obtained by sweet spirit of nitre made according to the old process.

The PRESIDENT said no one would dream of minimising the work of Professor Leech, but that work was done from a chemical, physiological, and pathological point of view. But the practice of clinical research should not be lost sight of, and they should not be guided too much by theory in these things. Science was liable to get rid altogether of the result of experience. As a diaphoretic, no doubt the old-fashioned spirit of nitre was a different thing to ethyl nitrite, which affected the arterial pressure.

Mr. WARD said they were indebted to Mr. Jones for bringing this subject forward. It ought to be settled for the peace and comfort of pharmacists as well as for the satisfaction of the manufacturer. He had made a note as to the variability of ethyl nitrite. From a sample made on October 27, 1890, 1 C.c. gave 25 C.c. of gas. It was then put on one side, and was not opened until December, 1893. The bottle was about three parts full, but there was no reason to suppose that a large amount of air had had access to it. When examined this 1 C.c. gave 7 C.c. of gas instead of 25 in 1890. He had examined it again this month, and found that 1 C.c. gave 4.5 C.c. of gas. It was made from as concentrated a solution of ethyl nitrite as was possible to obtain without having recourse to very special means, and was a fair indication of the liability to change which marked this body. It had been pretty well decided that the presence of moisture was to a very great extent the accelerating agent, and that if you had a sample of sweet spirit of nitre nearly free from moisture the liability to change was reduced. If pharmacists who did not make their own would insist on purchasing B.P. spirit of nitre instead of the '850, which was somewhat extensively purchased, they would insure a much greater permanence in the product. There did not appear to be much difference in the

method between one and the other, but the greater amount of moisture present greatly accelerated decomposition. His attention had been drawn to the case of a chemist who was prosecuted for the sale of sweet spirit of nitre, which had a specific gravity of '850, of which 5 C.c. gave 2.6 C.c. of gas. It appeared to him that the analyst or inspector did not act very wisely, but he managed to secure condemnation of the article, much to the distress of the chemist who had bought it, and very unwisely supplied it after keeping it for three years, not being aware apparently that it was so liable to change. Anything which would bring them to a better understanding of the product, and relieve them from harassing interference by food and drug inspectors would be a boon.

Mr. PERRY said six or seven years ago he made some experiments on the keeping properties of sweet spirit of nitre under the ordinary conditions of the shop, which were published in the *Pharmaceutical Journal*.

Mr. JONES, in reply, said the original motive for setting aside this sample was to find how long one could keep the ordinary B.P. spirit if the best conditions were adopted. He was frequently asked how long it would keep, and what was the best way of keeping it, and his answer always was, first buy the B.P. sample, and then put it in the cellar; then have a nitrometer upstairs and test it continually, and, if necessary, bring up some of the stronger article from the cellar to bring it up to the proper strength. His samples were kept in the original bottle, in an ordinary cellar not absolutely dark.

The next paper read consisted of

NOTES ON THE GEOLOGY, BOTANY, AND RIVER SYSTEMS OF OXFORD AND NEIGHBOURHOOD.

BY G. C. DRUCE, M.A.

I have been asked to say a few words on the physiography of the country round our ancient and classic city. I must ask those who know our district to pardon me touching on what to them may be a thread-worn theme; and to those to whom it may be new and strange I must offer my regrets that this most interesting subject has not fell into better hands to deal with. To all present an apology is needed for this innovation in our proceedings.

Situated as we are, nearly in the centre of England, in the midst of fairly well cultivated and fertile country, we can boast no romantic scenery such as may be seen in the precipitous cliffs, mountain gorges, or picturesque waterfalls of Northern Britain or Wales. But although placed amid tamer scenery, our district offers to the visitor much to interest and charm. We can boast no great elevation of surface, but our highest point, Walbarrow Camp, south of Hungerford, is nearly 1,000 feet high, and the eminences in the northern part of Oxfordshire, such as Edgehill and Tadmarton Camp, are about 800 feet. As late as the end of the seventeenth or beginning of the eighteenth century other ideas prevailed, for the then curator of Ashmole's Museum wrote to inquire of a fellow antiquarian which was the highest hill in Britain. Some, he says, "say Penygent, and others the Peak; but for his part he believes Stokeenchurch Hill in Oxfordshire to be the highest in Britain." It was over this hill that the coach road from Oxford to London was made, and its greatest elevation does not attain 800 feet. Visitors, therefore, from our mountainous parts of Britain must forgive my use of the word elevation, or rather interpret it relatively to our more equalised surface, the factor in this lessened variability being the geological character of the rocks of which it is composed. The older primitive rocks of igneous origin, the Silurian or Cambrian, do not enter our boundaries. We belong to more recent times, and

our rocks—I use the term rather in the geologic than the ordinary sense—are stratified. The oldest formations are found in the northern part of the area, and are represented by the lias group.

From Banbury, travelling southwards through the district from Oxford to Reading and Windsor, the visitor would pass over a succession of formations arranged in more or less regular bands, which cross the country almost west and east. These belong to successive periods of geologic history. With a trifling exception all the various strata in our area would thus be crossed in a railway journey of an hour and a half. It is this successive change in the strata which causes the pleasant and varied character of the country which is passed through. But from the soft character of the formations, the variations are gentle, and the outlines of the scenery are marked by no abrupt changes or sharply defined forms. Instead we get gently undulating country, broad alluvial meadows, low and rather obscure escarpments, low tracts of arable land, gently, softly swelling hills of chalk, and gravely heathland as we pass along.

If, however, the visitor enters our boundary by the London and North Western Railway from Bletchley he will not cross, but, instead, will follow along one of these bands of strata from east to west, and this formation is the London clay, which forms a low, flat, uninteresting tract of country. If our visitor comes from the west and enters Berkshire from Swindon, so, too, he will follow another band, in this case composed of gault, which, like the Oxford clay, forms low, flat, uninteresting country between Swindon and Didcot.

With your permission, therefore, I will shortly enumerate the various geologic formations found in our borders.

The oldest, as I have said, is the Lower lias clay, found in North Oxford, which exists as a blue, clayey material. Near Banbury it shows itself as a hard, shelly limestone, full of innumerable fossils, sufficiently dense to allow of its being worked into chimney pieces, which take a fair polish. It is locally called Banbury marble.

Next to this comes the marlstone, which forms an elevated plateau. This formation was once covered with the upper lias, but this has been denuded from the more elevated portions of its area. The top of the plateau is formed of a stratum called the rock band; it is a sandy limestone with a considerable percentage of iron oxides. Near Banbury it has been extensively quarried for iron ore. In 1874, 40,000 tons were excavated. Near Fawler, on the confines of Wychwood Forest, the same formation is also quarried for ironstone. One of our most local plants is found upon it, *Thlaspi perfoliatum*, whose distribution is confined to three counties.

The upper lias consists of bluish clay and shales, which have been so denuded as now to consist only of narrow strips and outliers. A well-known pharmacist, Mr. Beeley, of Banbury, whose work in natural history has been so valuable, has made a very complete list of its fossils.

Lower oolites are represented by some sandy beds, which are found upon the Upper lias beds in North Oxfordshire. Epwell Hill, 743 feet high, is capped by them; as are also Wigginton, Crouch Hill, and Tadnorton.

The Northampton sand really includes two formations, one belonging to the inferior, the other, which is the upper portion, to the great oolite. Eastwards in Lincolnshire these formations are separated by a thick bed of limestone, which has thinned out westwards, so that in Oxford the two formations have met, and are almost indistinguishable.

Great Oolite.—To the south of the district covered by the Northampton sands, the beds known as the

Stonesfield slates occur in the form of a laminated limestone. This contains an immense number of fossils, not only of animals, but plants and insects. A very extensive series is preserved in the University Museum here. This stone splits readily along the bedding planes into slabs thin enough to be used for roofing purposes. The roof of Wadham College may be cited as an example.

The Tainton quarries have produced the most durable stone in the country; Burford Church, Blenheim Palace, the inside of St. Paul's Cathedral, and many old buildings in Oxford have been built out of stone belonging to the Great oolite.

The upper part of this formation consists of a group of limestone marls and clays. It forms a tabulated surface, intersected by narrow channel-like valleys. In fact, it forms a repetition of the marlstone plateau, and, like that, is dotted over with outliers, which in this case consist of Forest marble, capped by Cornbrash and Oxford clay. East of the Cherwell it is covered with a thick deposit of drift, which gives an undulating surface to the country near Brackley. The escarpment of the great oolite is much broken by faults. The interesting plants found on this formation are the very local *Stachys germanica*, *Salvia pratensis*, *Thlaspi perfoliatum*, *Astragalus danicus*, *Cephalanthera pallens*, *Cynoglossum montanum*, *Monotropa*, the latter plant occurring on two small outliers, one at Islip, the other at Middleton. Plants which are especially abundant on this formation are *Clematis vitalba*, *Carduus eriophorus*, *Brachypodium pinnatum*, and *Bromus erectus*.

The Forest marble is a sub-formation of the great oolite, and is so called from its occurrence in Wychwood Forest. It consists of hard, flaggy, limestones, much ripple marked, and often formed of oyster shells cemented together by carbonate of lime. It is of very irregular occurrence. Next to this in age is the cornbrash, which is the upper formation of the Lower oolite, and consists of a group of limestones, very regular in its bedding, and which stretches across Oxfordshire in a rather regular band of not very interesting country. It is well adapted to the growth of wheat. A curious row of inliers of the cornbrash are brought up along an anticlinal line stretching far eastwards. They occur as dome-shaped masses, rising out of the flat, dull plain of the Oxford clay, and on these inliers many villages have been built.

None of the foregoing formations extend into Berkshire.

The Middle oolites consist of the Oxford clay, the lower calcareous grit and coral rag. The former I have alluded to; it consists of a thick blue clay, weathering on the surface to yellow. It covers a broad tract of country from Lechlade, by Bampton, Ducklington, Hampton Poyle, the dreary flat of Otmoor eastwards, to the Bucks border. It is to this formation and the proximity of the river that Oxford owes its humid and relaxing air. The Oxford clay is 600 feet thick near this city. In the west a thick deposit of drift occurs, the Wychwood outliers being capped with a quartzose gravel at an elevation of 500 feet. On these places several ericetal and uliginous plants occur of interest, such as *Erythraea pulchella*, *Sagina nodosa*, *Scirpus fluitans*, *Peplis*, *Comarum palustre*, *Mentha piperita*, *M. sylvestris*, *Stellaria palustris*, and *Rumex maritimus*. One very rare and exceptionally interesting plant found on the Oxford clay is *Sonchus palustris*. Roses are very variable on the clay, while Rubi are but poorly represented. The lower calcareous grit and coral rag form an elevated plateau overlooking the Oxford clay, which extends from Faringdon, by Cumnor, immortalised by Scott, to Beckley and Stanton. Although this plateau is of no great height, yet very extensive and beautiful views

may be obtained from the top of the northern escarpment. *Arabis perfoliata*, *Vicia lathyroides*, *Sedum dasphyllum*, *Carum segetum*, *Calamintha nepota*, *C. menthaefolia*, *Geranium rotundifolium*, *G. pyrenatum*, *Sisymbrium sophia*, *Carduus tenuiflorus*, *Impatiens parviflora*, *Arenaria tenuifolia*, and many other plants occur. The small valleys formed by streams which flow from its escarpments afford the most interesting bog land in the district. The list of plants is too extensive to give in anything like detail, but I may say that *Scirpus sylvaticus*, *Potamogeton plantaginifolius*, three species of *Utricularia*, *Parnassia*, *Pinguicula*, *Drosera*, and a rich series of sedges are to be found.

The Headington quarries in this formation have yielded much of the stone of which Oxford has been built. The ruined condition of many of the walls is owing to the use of this stone, which weathers very badly, especially if it be put in so that the bedding planes are exposed. The bridge at Henley is also built of this stone. It is largely composed of shells and corals.

We now arrive at the upper oolite, represented by the Kimmeridge clay and the Portland sand and Portland stone.

The Kimmeridge clay is a very stiff, dark blue, or olive green clay, sometimes sandy, and occasionally with bands of fossiliferous limestone. It stretches in an irregular band across the country, often forming flat pasture land, but on the eastern side is obscured with a thick deposit of drift. Large crystals of selenite are found in it on Shotover Hill. In Berkshire, at the juncture of it with the coralline oolite, one of the springs which it throws out is sufficiently saline to give rise to a partly marine flora. *Scirpus maritimus*, *Apium graveolens*, *Carex distans*, *Sporogularia marina*, *Xanthochellia pedicellata*, *Vaucheria dichotoma*, var. *submarina*, etc., occur.

The Portland sands preserve the calcareous grit. They are found on the Shotover range. The Portland stone is a white limestone, which, like the Portland sand, is only very sparingly represented in the area. The higher portion of Shotover Hill is formed of these beds. On the ordnance map the iron sands on the top of Shotover Hill are coloured, as if they belonged to the lower greensand, but they have also been placed in the Purbeck beds; now they are believed to belong to the Wealden series, a fresh water formation. These sands contain a very thin bed of excellent ochre. The vegetation on them is also very interesting, but enclosures have done much to rob it of their characteristic flora.

The cretaceous formation next claims attention. The lower greensand makes a light arable soil. At Faringdon it forms the well-known sponge gravels. For a considerable distance in the Vale of Berks this band of lower greensand is overlapped by the gault. The hills of Foxcombe, Boars Hill, the pleasant wooded district of Nuneham (which we shall see on our excursion), are of this formation.

The gault, which is a pale blue clay, extends in an unbroken band across the area, the ground is flat and often marshy. *Rumex maritimus*, *Fritillaria*, *Bidens cernua*, etc., are found on it.

The upper greensand extends parallel with the gault in a belt of valuable arable land from Wiltshire to Buckinghamshire.

Next to this comes the chalk, which forms an elevated area of south Oxfordshire and central Berkshire. The bold northern escarpment stretches from the Aylesbury hills across to Swindon, its highest point being touched on the White Horse Hill, nearly 900 feet high; and the top of the escarpment is marked by a long line of British encampments, and the ancient road called the Ridgeway. The views from the heights must be seen to be appreciated. The chalk consists of the lower and upper chalk, which

may be distinguished by the occurrence in the upper chalk of flints, which are usually placed in the bedding planes. The cutting at Pangbourne shows this very well indeed. The flora of this district is peculiarly interesting—*Orchis simia*, *O. militaris*, *Ophrys apifera*, *O. muscifera*, *Neottia*, *Linaria repens*, *Iberis*, *Heliborus viridis*, *Daphnemetereum*, *D. laureola*, *Galium sylvestre*, *Atropa*. Near Newbury and Hungerford the chalk dips under the River Kennet, which really flows through a synclinal trough of chalk. It re-appears on the southern side in a bold escarpment which attains the highest point of the chalk in southern England, namely, 975 feet. Near Kintbury some 2,000 or 3,000 tons of whitening are made annually. It is prepared from the upper chalk by a rough process of grinding and elutriation. The chalk country of Oxford forms a portion of the Chiltern Hundreds. In the south part of Oxfordshire and the central part of Berks the chalk becomes more or less covered with tertiary deposits. Between these and the deposit of the chalk formation, which, you know, is to a great extent composed of Foraminifera (which our revered member, H. B. Brady, studied so closely), an immense interval of time elapsed, the intervening beds either having been denuded off, or the chalk must have been raised above water level. These tertiary beds belong to the Eocene formation, and consist of the Reading beds, and London clay. It is to the occurrence of these two formations that the heathy character of so large a portion of the south is due. The Reading beds consist of alternations of clay and sand. The London clay sometimes contains septaria. Near Wargrave it reaches an elevation of about 500 feet. On these formations such plants as *Centunculus*, *Radiola*, *Erica tetralix*, *E. cinerea*, and *Vaccinium* are found. To the Eocene series may be also placed the Bagshot beds, which cover a large surface of southern Berkshire, but which do not extend into Oxford. These Bagshot beds consist of sand, gravel, with occasional seams of pipe-clay. The surface of the country on them is completely changed, heath-land, pine plantations, and hilly country, with deep alder gullies, and bogs covered with sundew, cotton grass and bog myrtle are to be found. Spectacularly interesting plants of this area are *Illocebrum*, *Hypochaeris glabra*, *Arnosericis*, *Teesdalia*, *Osmunda*, *Viole lactea*, *Phegopteris polypodioides*.

A large area of southern Berkshire, near Maidenhead, is covered with low level gravels. On these *Dianthus armeria*, *Arabis perfoliata*, *Lactuca virens*, etc., are found. When I have mentioned that our rivers are often bordered by broad alluvial meadows which here and there are covered with *Fritillaria* or fringed with Snowflakes, and underneath which rest the bones of primeval man, or, at any rate, the rude instruments he used, mingled with the bones of the animals he hunted, such as *Bos primogenius*, the wolf, and the beaver, I think that the salient features of the geology of the country have been touched upon.

A few minutes may be given to the rivers, or rather river, which drains our area. Oxford, as you know, is seated on a tongue of land between two rivers, the Thames and Cherwell, and the area I am treating almost exclusively in the Thames basin. A small portion only in the north-east drains into the Ouse, which flows into the German Ocean; while a smaller piece in the north-west is drained by the Stour, which is a tributary of the Severn, which drains into the Western Sea.

The Thames basin contains about 5062 square miles. The river takes its rise near the Foss road, from the oolitic limestone rocks of the Cotswolds, the escarpment of which is the western boundary of the basin. The reputed source of the Thames is in Trevelyan Mead, about three miles south-west of Cirencester. The Thames head, which Leland called the head of Isis, is only 830 feet above the sea level.

From this point to the Nore the river measures 210 miles. For 110 miles of its course it touches the counties of Oxford and Berks, that is, from St. John's Bridge, near Lechlade—where was formerly a priory of Black Canons—to Old Windsor. From Lechlade to Oxford it is principally excavated in Oxford clay, the escarpment of the coralline oolite overlooking it on its southern side, while the Faringdon Clumps, planted by the poet Pyc, and the bold headland of Wytham, and the fir-topped Hirst of Cunnor, so often alluded to by Matthew Arnold, are prominent objects on its southern side.

Between Oxford and Windsor the river cuts its way through successive bands of strata, often at a direct angle to their strike.

In its progress through our district the Thames receives many tributaries. Among these may be mentioned the Windrush, which, like the Thames, takes its rise from the Cotswolds, and is the largest affluent of the Thames. Drayton called it the nitrous Windrush. In its rather straight course through Oxfordshire it passes by Burford, which has a most handsome and interesting church, and through a country which was, at the beginning of the century, open downs, covered with short sweet grass and redolent of thyme, where *Anemone pulsatilla*, the monk orchis, the field rag-wort, the purple milk vetch, and spider orchis grew, but which now, alas, are bleak tracts of arable ground, with only an occasional strip of grass by the road-side to tell of the former vegetation. In such places *Stachys germanica* is still to be found. Passing Witney, whose ancient industry of blanket manufacturing was fostered by its water, the Windrush enters the Thames near Cokethorpe. The Evenlode, another tributary, brings in its turbid waters gathered at its commencement from a wide tract of lias, which forms an obscure and low, and not very recognisable watershed between the Thames and Severn, about 450 feet above the sea between the "mercat" town of Stow and Icomb. The Evenlode runs its course of 30 miles in winding sweeps, whose general direction is almost parallel to that of the straighter stream of the Windrush. It passes by Churchill, the birth place of Warren Hastings and Wm. Smith, the father of geological science, and, washing the ruined Cistercian monastery of Bruern Abbey, glides under the once extensive forest of Wychwood, and in its course by Stonesfield quarries to Handborough passes through well-wooded and picturesque country, forming part of the demesne of historic Woodstock, itself lending a great charm to the scene by its beautiful curves, bordered by terraced slopes, whose hanging woods are here and there adorned with the pencilled flower of the wood-vetch, or starred with the rare *Gagea*. Wychwood contains two species of *Oxyglossum*, *Atropa belladonna* in plenty, and both *Uelleborus fatidus* and *viridis*. The curious toothwort, *Lathraea*, is also found there, as well as the rare *Lactaria pratensis* and the limestone polypody. The Evenlode enters the Thames near Cassington, once the home of the Percys of Northumberland. From this point the Thames curves in a bold sweep to the northwards, round the beautiful woods of Wytham. These woods are situated on the sides of an eminence, once the site of a castle belonging to Cynewulf, King of the West Saxons, commanding extensive views of the Bay of the Upper Thames. They are very interesting from a botanical point of view, containing as they do *Atropa*, *Hyoscyamus*, *Verbascum thapsus*, *Daphne genkwa*, *Samolus*, *Astragalus glycyphyllos*, *Monotropa*, a white flowered helleborine, the bee, the frog, the ash, and butterfly orchis, and *Carex pendula*. Near Wytham is Godstow, where *Aristolochia* and the rare *Nitella macronata* has been found.

At Yarnton the Thames turns southwards to Iwercoote, where the maximum amount of water

passing in flood time was estimated at over 70,000 cubic feet per minute.

The many small branches of the Thames at Oxford give a home to a rich variety of marsh plants. The chief varieties being *Limnanthes*, *Sim latifolium*, *Aritillaria*, *Utricularia*, *Hydrocharis*, *Rumex maritimus*, *Mentha pulegium*, *Polygonum minus*.

At Oxford the Thames receives another important tributary from Oxfordshire, namely, the Cherwell, which has a catchment basin almost equal to the Thames above Oxford, namely, 600 square miles. It rises in Northamptonshire, near Charwelton, on the elevated table land of lias, capped here and there with outliers of oolite, from which three springs send their waters respectively to the German Ocean, the English Channel, and the Bristol Channel.

At Abingdon the Thames is replenished by the Ock, a purely Berkshire watercourse, whose numerous sluggish streams drain the Vale of the White Horse, which is excavated for the most part in Kemmeridge clay. In this area *Doronicum pardalianches*, *Polygonum dumetorum*, *Sedum dasphyllum*, *Calamintha nepeta*, *Wahlenbergia hederacea*, *Viola palustris*, *Equisetum sylvaticum* occur. Below Abingdon the Thames soon passes into cretaceous beds, and at Clifton Hampden flows past bold cliffs of conglomerate, formed by the green sand, to Dorchester, which is on the site of the Roman camp, Durocina, itself occupying an earlier British settlement, and which gave its name to the episcopal see founded by Birinus in 634. Under the walls of the magnificent church flows the Thame, which rises in the high ground of Quainton and Brill, and the lower chalk escarpment near Tring, in Buckinghamshire, drains in its flexuous course a very similar tract of country to that drained by the Ock in Berkshire. The river near Dorchester affords the beautiful Snowflake, and it is bordered by *Acorus calamus*, which I believe to be native by the Thames.

From historic Wallingford the Thames continues its southern course through a narrow and beautiful green valley adorned with fine elms and bordered by hills of chalk often well wooded on the slopes, or studded with bushes of Juniper. These woods have belladonna, Solomon's seal, the butcher's broom, the monkey, soldier, bee, fly, frog, burnt, bird's-nest, and many other orchids, *Pyrola minor*, and *Pyrus terminalis*. The grassy slopes are resplendent with the chalk milkwort and horseshoe vetch, or here and there show *Anemone pulsatilla*. *Lactuca virosa* is to be seen on the wooded banks, and in the more inland portions *Daphne mezereum* is native. In the course from Wallingford to Reading the Thames receives a small Berkshire stream called the Pang, so called from a Saxon word signifying pain on account of the hardness of the waters. From lovely Pangbourne, beloved by artists, where the bright but calcareous water of the Pang mingles with the greener coloured Thames, the parent stream passes on under the hanging woods of Whitchurch, and by Maple Durham's charming mill, and by the Elizabethan mansion of the Blounts to the busy town of Reading. A locality for *Galium sylvestris* is in this vicinity. At Reading another feeder of the Thames comes in, namely, the Kennet, bright for silver eels renowned, whose principal source is in the chalk downs of Wiltshire, but which has also two Berkshire tributaries, the Lambourne and the Emborne. The one rising near the seat of a castle of Alfred, and the ancient battlefield of Ecesadune, the other passes from High Clere, by the site of Falkland's last battle. In this area the bog myrtle, the *Rhamnus frangula*, two of the sundews, two *Utricularias*, and many other interesting plants are to be found.

From Reading the Thames passes by the hanging woods of Sonning, with *Dipsacus pilosus*, *Scirpus sylvaticus*, and passes under Shiplake's ancient bridge, near which grows the great dodder, and then receives

the River Loddon, which Pope described as the "Loddon slow with verdant alders crowned," a stream of great charm, and extremely rich in vegetation. It is the home of the rare *Potamogeton fluitans*, *P. rufescens*, *Typha angustifolia*, *Carex stricta*, *C. acicularis*, *C. vesicaria*, etc., and a profuse growth of the lovely Snowflake. From Shiplake the Thames passes Henley, the most ancient town in Oxfordshire, and Park Place, situated on high ground 300 feet above the river. *Linaria repens* is plentiful here, as is *Hypericum montanum*. *Euphorbia*, *Esula*, *Dianthus armeria*, *Spiranthes autumnalis*, and *Viscum* are also in the vicinity. Between Hambledon and Marlow is "that beautiful valley through which the Thames, not yet defiled by the precincts of a great capital, nor rising and falling with the flow and ebb of the tide, rolls under woods of beech round the gentle hills of Berkshire."

I may now just allude to the fact that the ancient culture of woad was carried on at Wantage until the beginning of this century, and that in a village near Didcot a small quantity of hops have been grown for many years.

The following plants found in our area are of especial interest to the pharmacist:—

Anemone pulsatilla, *Helleborus viridis*, *H. fatidus*, *Papaver somniferum*, *P. rhæas*, *Brassica alba*, *B. nigra*, *Cochlearia armoracia*, *Isatis tinctoria*, *Rosella luteola*, *Drosera*, *Linum catharticum*, *L. usitatissimum*, *Rhamnus frangula*, *R. catharticus*, *Sarothamnus*, *Melilotus*, *Daucus*, *Rosa canina*, *Oenanthe crocata*, *Apium graveolens*, *Cornus*, *Sambucus*, *Valeriana*, *Anthemis nobilis*, *Tanacetum*, *Artemisia absinthium*, *Inula helenium*, *Lactuca virosa*, *Taraxacum*, *Erythraea*, *Mentha*, *Symphytum*, *Datura*, *Hyoscyamus*, *Atropa*, *Solanum dulcamara*, *Verbascum thapsus*, *Digitalis*, *Leonurus*, *Marrubium*, *Mentha piperita*, *M. pulegium*, *Polygonum bistorta*, *Daphne laureola*, *D. mezereum*, *Aristolochia clematitis*, *Acorus europæum*, *Humulus*, *Ulmus*, *Quercus*, *Populus*, *Salix*, *Juniperus*, *Convallaria*, *Polygonatum*, *Colchicum*, *Acorus*, *Triticum repens*, *Lastrea filix-mas*, *Lycopodium*.

The PRESIDENT said they could not expect the Conference to discuss this paper in the ordinary way, but he was sure they would be all ready to get up and express their thanks to Mr. Druce for the marvellous view he had given of so wide a subject. This paper had formed a most pleasing interlude to other papers, and it occurred to him that, as in connection with the British Association there were evening lectures which formed a great feature of their meetings, so it might be possible at future meetings to devote the Tuesday evening of the Conference to any special feature connected with the district in which they were assembled, where there was a man capable of dealing with any of the special features connected with the natural science of the neighbourhood, though he did not suppose they would always be able to find so capable a man as Mr. Druce. It was truly marvellous that he should be able to say so much in so short a time.

(To be continued).

Books, etc., received.

MYXEDEMA, CRETINISM, AND THE GOITRES. By EDWARD J. BLAKE, M.D., M.B.C.S. Pp. i.-xi., 1 to 89. Illustrated. 3s. 6d. Bristol: John Wright and Co. From the Publishers.

EXPERIMENTS IN CROSSING FOR THE PURPOSE OF IMPROVING THE COTTON FIBRE. Bulletin 56 of the Agricultural Experiment Station, Auburn, Alabama. By P. H. MELL. Pp. 47. Illustrated. From the Board of Direction.

Dispensing Memoranda.

[651.] A correspondent sends the following prescription, in dispensing which an energetic reaction took place, CO₂ being evolved, and a certain amount of CaCO₃ formed, whilst other decompositions, concerning which information is desired, seemed to be proceeding at the same time:—

℞		
Sodii Bicarbonat.		℥iil.
Calcii Hypophosphit.....		℥ss.
Tr. Nucis Vom.		℥ss.
Syr. Zingiberis		℥ss.
Infus. Aurantii ad.....		℥viii.
Capt. ℥ss. post cibos.		

Notes and Queries.*

LIN. SAPONIS.

[767]. It is suggested by F. Hemm that the best way to prepare this liniment is to digest the soap in fine powder rather than in shavings, with water until a translucent jelly results, then dissolve it in the alcoholic solution of camphor and oil of rosemary.—(Am. Journ. Pharm.).

SOFTENING HARD EXTRACTS.

[768]. Referring to England's recommendation of glycerin for softening extracts, prior to making ointments from them (see note 756 on page 69), a correspondent states that glycerin, though excellent in many cases as a solvent, is not to be recommended in this particular instance; owing to the oleaginous character of the glycerin, the hard extract constantly eludes its action, whether the softening process be attempted by means of pestle and mortar or on the pill-slab. When hard extract has to be incorporated into a suppository, a few drops of spirit will reduce it to a fit consistence, a plan to which there is no objection, as the spirit is entirely evaporated long before the suppository is finished. Supposing the hard extract is not intended to be mixed with either oil or fat, a few drops of boiling water will suffice to make the extract plastic, after which a minute quantity of glycerin should be added to ensure its preservation.

PHOSPHORUS PILLS.

[769]. Three methods of dispensing phosphorus pills are described in the *Journ. de Pharm. d'Antverp.* (1) Melt aust., 500 Gm., on a water-bath, add phosphorus 1 Gm., and heat until melted. Then pour the melt into a mortar and stir until cold. (2) Mix intimately red phosphorus, 1 Gm., with starch, 50 Gm., and use as excellent very fresh curds, employing a wooden mortar for the operation. Dust the pills with white starch and preserve them in tin boxes. (3) Dissolve

* For the sake of ready reference it is convenient that the notes and queries should be numbered, and it has been thought desirable that the numbers should be consecutive with those that have appeared in former volumes of the Journal (see Vol. xlii., p. 895). The first note on page of the present volume should therefore be numbered [747], and subsequent ones accordingly.

phosphorus, 10 Gm., in carbon bisulphide, 5 Gm., and liquorice powder, 6 Gm. Triturate until the sulphide has completely evaporated, add sufficient water to form a mass, and coat the pills with balsam of tolu. To check oxidation the water may be added before the bisulphide has entirely evaporated, and the mass should then be worked until evaporation is complete.

CREOSOTE PILLS.

[170]. New methods are continually being proposed for these pills and old ones being revived in different continental journals. Thus, A. Stern forms a mass containing creosote, 5 parts, and balsam of tolu, 12 parts. The balsam is half melted in a porcelain capsule at a gentle heat, the creosote added to the semi-fluid, and the mixture stirred with a glass rod. Whilst yet warm the mass is run on to a marble slab and left to cool, after which it is preserved in a well-closed vessel until required. When about to make pills, powdered balsam of tolu, 12 parts, is mixed with creosote, 5 parts, and 17 parts of the above mass added. No other excipient is required; the flow of the tolu masks that of the creosote; and, if sugar-coated, the pills may be kept for a considerable length of time. Other medicaments may, of course, be added, and should be first mixed with the powdered balsam of tolu. E. Dieterich triturates calcined magnesia, 1 part, with glycerin, 2 parts, then gradually adds creosote, 10 parts. Calcined magnesia, 5 parts, powdered extract of liquorice, 5 parts, and liquorice powder, q.s., are then added in the order given. The pills should be dusted with finely powdered coffee, or with a mixture of coffee and cinnamon. It may be dispensed in the same way. W. Kollo triturates the creosote with two drops of water to each gramme, any soluble medicaments required being triturated with the water. Extract of liquorice of very fine power (*poudre très fine de suc de liasse*) is then added until a soft mass is formed, to which insoluble substances such as quinine may be added, and the desired consistence obtained by the addition of powdered liquorice root, q.s. Alcohol, terpinol, and eucalyptol may be massed in the same way, but instead of water syrup should be used, equal in weight to the medicament; and whilst fully triturating in a mortar a little gum arabic as much powdered extract of liquorice as necessary should be added. The soft mass formed is rolled as before, except that a little magnesium carbonate should be added. The medicament will constitute 25 per cent. of the finished mass. The formula proposed for the supplement to the German Pharmacopœia is creosote, 10 Gm., liquorice powder, 5 Gm., glycerin, 1 Gm. Make 200 pills and roll in powdered cinnamon. Each will weigh 0.15 Gm., and contain 0.05 Gm. of creosote (*Mon. de la Pharm.*).

ANTIMONIUM TARTARATUM, B.P.

[171]. "Will you inform me if the B.P. is correct in being under tests for antim. tart., that 29 grains dissolved in water, and H_2S passed through, yield a precipitate which when dried weighs 15.1 grains? I can make it come to 14.6 grains.—R. H. MARSHALL." Antimonium tartaratum, B.P., appears to yield more

than the theoretical proportion of sulphide, because the precipitate is liable to contain moisture, oxygen, free sulphur, and acid tartrate of potassium. According to Watt's 'Dictionary of Chemistry' the orange-red precipitate is amorphous hydrated Sb_2S_3 , which is only fully dehydrated at $200^\circ C.$, whereas in the B.P. process the temperature of $100^\circ C.$ is adopted for dehydration. The abandonment of determination by sulphide and the substitution of Mohr's volumetric method were recommended by Professor Attfield, in his report on the pharmacopœia for 1888.

Correspondence.

THE PREPARATION OF SUPERFATTED SOAP, ETC.

Sir,—The answers to Mr. Moffat's criticisms on my note upon the preparation of superfatted soap, etc., are obvious and easy. Undoubtedly, the sample of caustic potash which I used in my first experiment was a weak one. This accounts for the seemingly large quantity of the alkali required for the complete neutralisation of the lard. Unfortunately, I have none of that particular potash left, so that I am unable to determine its strength. It was the last of an old stock. But I have recently estimated seven samples of KHO, taken at random, and found a very considerable variation in their strengths.

The figures are—

1.....	89.6 per cent.
2.....	85.6 " "
3.....	78.4 " "
4.....	92.4 " "
5.....	90.7 " "
6.....	77.8 " "
7.....	73.8 " "

Hence it will easily be seen that it is manifestly unfair of Mr. Moffat to condemn my figures, based upon work done with a weaker alkali than the one used by himself, or to find fault with my figures at all, since he cannot possibly know the strength of the KHO used by me. It is impossible, in the face of such variation in the strength of caustic potash, to pretend to give any definite formula for such a preparation as the one under discussion, nor did I attempt to do so. I suggested the calomel test because it is a simple and easy one, and in the hands of the ordinary pharmacist does away with the troublesome and tedious method by titration. Very few pharmacists even keep standardised solutions at hand, and of those who do, how many use vol. sol. of HCl? I claimed for the calomel test that it held to one-tenth of a grain when working with over 300 grains of the soap. Mr. Moffat does not disprove this, but states that "it failed to indicate the presence of very appreciable quantities of free alkali, which were immediately detected when the alcoholic solution of the soap was tested with phenol-phthalein." I adhere to my former statement of the value and usefulness of calomel as a test for neutrality. I have since compared the tests many times, and have found the phenol-phthalein bear out the calomel test in every instance, although in the case of hard soaps an alcoholic solution was not always so readily obtained, and the application of the calomel test was a great saving in point of time. In no case in my hands has the calomel test failed where the phenol-phthalein has also indicated excess of alkali. I see, therefore, no reason to alter the statements made in my first note. I distinctly stated that the figures given were only those obtained from samples of KHO and lard then at my disposal. With the calomel test the pharmacist can rapidly and accurately know when he has arrived at neutrality in the preparation of the soap. If there is one point I would suggest, it is that the lard and KHO should be given rather more time to combine, since when working with large quantities three, or four days seems hardly sufficient.

The Royal Infirmary,
Liverpool.

J. R. JOHNSON.

THE NOSTRUM TRADE.

Sir,—Your leader in the *Pharmaceutical Journal* of July 28, and Mr. Martin's address at Oxford bearing so strongly upon the same subject, are worthy of the most serious consideration of the whole body of registered chemists and druggists. You say the druggist should cease to sell quack nostrums. Mr. Martin says the time is very near when pharmacy must make its choice between trade and profession. The dream that a complete separation should ever take place in English pharmacy, or even that the trade element should form the smaller portion, is to many of us quite utopian. There are among us those who would willingly wash their hands of every unclean thing, but the difficulty is to know where to draw the line between clean and unclean, and we cry to you and the leaders in our craft for "light," "to lighten our darkness." Had the chemists and druggists of the past made greater and more rapid competencies than their neighbours we might infer that the large profits on drugs had been abnormal, and that the raids made upon our preserves by outsiders were somewhat justified; but history has recorded nothing of the kind, and experience and custom have allotted to each calling a tariff of remuneration fairly just and equal. Even if the Pharmacy Act were passed, as it is said, for the benefit of the public, philanthropy is not the first cause of the pharmacist's existence. Could you suggest that he take his stand on the fairly distinct principle that he supplies nothing but what he has either made himself, or the composition of which is stated and guaranteed? Even then the advance is not much, for the retailing of the purest drugs is trading; and in sponges, invalids' foods, surgical and sanitary appliances, *et hoc genus* (which, I think, all will admit fall most naturally to the domain of the pharmacist—*habenda ratio valetudinis*), we have a large trade element to deal with; indeed, so large is the field that, considering the rapid and apparently successful extension of the company chemist's business, the very serious question arises whether it would not be wiser to treat trade matters on trade principles, extending them to their utmost rather than giving them up altogether. After thirty years' experience behind the counter I fail to see the slightest increased tendency in medical men to cease compounding their own medicines. If we give up the trade, what is there left? In the words of the song the chemist might then truly say, "He don't know where he are." Can nothing be officially done to bring about a more rapid change in this matter, and to induce the general practitioner to treat the pharmacist with greater liberality? The outlook is strained and perplexing to those anxious to uphold the dignity of the profession, and at the same time to procure bread and cheese for themselves and families.

Upper Tooting, S.W.

JNO. INGHAM.

THE REVISION OF THE BRITISH PHARMACOPEIA.

Sir,—I now submit some further notes, in continuation of those printed at page 1105 of last volume:—

Ung. Acid. Bor.—This seems to be the only ointment of the B.P. in which, from a pharmaceutical point of view, it is desirable to retain the paraffin base. By following out strictly the directions given in the text, and adopting all reasonable minutiae which practice readily supplies, we may obtain in all respects a most satisfactory preparation.

Ung. Acid. Carb.—Here the formula does not at all answer. The acid gradually comes out centrifugally and collects on the surface, leaving the mass of a nasty mottled appearance, most readily so when ordinary carbolic acid is used, and eventually after about a month, when the purest kind of phenol is employed. After repeated experiments the following combination seems the best that can be devised:—

Take of—

Pure phenol	2 parts
Yellow wax (English)	9 "
Spermaceti	3 "
Best olive oil	12 "

Melt together with the smallest possible amount of heat, adding the phenol last, and stir constantly until cold. Of this I have on hand a sample of stock prepared in January last, as well as some prepared in April; both are still uniformly in perfectly good condition.

Ung. Eucalypti.—It seems best in this to replace the hard paraffin by good English beeswax.

Ung. Hyd. Nit. Dil.—Prepare this with pure lard place of the soft paraffin.

Ung. Hyd. Oz. Rub.—Why not restore the formula B.P. 1867, which really leaves nothing to be desired, the

Take of—

Red oxide of mercury, in fine powder	62 grains.
English beeswax	1 ounce.
English drawn almond oil	1 "

Melt the wax in the oil. Keep the mixture well stirred and add the oxide when congelation is just about to be

Ung. Resinae.—Simplify thus:—

Take of—

English beeswax	8 ounces.
English drawn almond oil	8 "
Amber resin, in powder	8 "
Pure lard	6 "

Melt the wax in the oil with the lard, then scatter powdered resin over the surface of the heated mixture until dissolved, then remove from the source of heat and stir diligently until cold.

In conclusion, I would like to add that the above free trade seems to be answerable for a great deal of trouble that has crept into modern pharmacy. Notable this so with regard to honey, wax, and the thousand and one sophistications of almond and olive oils. Native products should surely be recognised as much as possible, the pharmacopoeia of any country, not alone for the encouragement of native industry, but more because of comparative ease with which the genuineness of such productions may be determined in contrast with the difficulty of diagnosis in the case of foreign products, and the plexity of tracing sophistications home to the guilty type. The cheapness of the paraffins, too, is an unmitigated evil in the unfair displacement of the far worthier lard. I am satisfied that perfectly pure lard will keep much better and longer than paraffinum molle, it is no benzoinating either. A sample at hand now, bottled January last, after six months is sweet and good as when first made. With regard to ointments not keeping, this somewhat depends upon their nature, and such must be prepared fresh-and-fresh. More commonly the unsuitability of the vessels in which they are stored, or the ever-changing temperatures of the locality, is at fault, and is remedied by proper attention to reasonable details.

West Marylebone.

J. C. H. H.

EMPLASTRUM LYTTÆ, P.B.

Sir,—I should feel obliged if your readers would suggest a remedy for the variability of this plaster have had repeated complaints that it does not act after several applications. Samples used have been from various houses; and since the plaster has been known to fail so often, I would like to bring this fact to notice for its improvement.

West Brighton.

H. H. M.

Answers to Correspondents, etc.

D. Dickinson.—1. *Polytrichum commune*. 2. *Cladonia rangiferina*. 3. *Sphagnum acutifolium*.

"T. G."—1. Probably a foreign plant. Send a men with lower leaves. 2. *Verbena officinalis*.

"Secundus."—You appear to have sent the whole of your holiday collection to be named, overlooking that with the help of a good "flora" you could identify them all for yourself. Whilst always willing to afford any reasonable amount of assistance, we cannot occupy time and space by doing and recording work to be of any real value, students should do them. The more interesting specimens are duly named, but do not send more than six at once, in future. 3. *Adiantum millefolium*. 5. *Prunella vulgaris*. 7. *Euphrasia nalis*. 8. *Spiraea filipendula*. 11. *Daucus carota*. 22. *Cytisus scoparius*. 23. *Teucrium scorodonia*. 24. *acetosella*. 34. *Potentilla tormentilla*. 41. *P. canina*.

Correction.—On page 141, column 1, line 20, for "phigiceæ" read "Magnoliaceæ, namely *Drims*."

COMMUNICATIONS, LETTERS, etc., received from Mr. Elborne, Hill, Lunan, Martin, Naylor, Parker.

"THE MONTH."

Proteids of Wheat.

Osborne and Voorhees have separated from the wheat kernel five distinct proteids—gliadin, glutenin, a globulin, an albumin, and a proteose, besides a proteose-like body. GLIADIN is readily dissolved from wheat flour (4.3 per cent.) and from gluten by hot dilute alcohol. It also exists in the rye kernel, but is quite distinct from the alcohol-soluble proteids of barley, maize, and oats. When dehydrated it forms a snow-white, friable mass, easily reduced to powder. If dried after moistening with dilute alcohol or water it resembles pure gelatin in appearance, and may be obtained in thin, clear, transparent sheets. It becomes sticky and slightly dissolves when treated with cold distilled water. As the temperature of the water is raised, the amount dissolved is proportionately increased, but the solutions deposit partly on cooling, precipitation being instantaneous when sodium chloride is added. Gliadin is entirely insoluble in absolute alcohol, and gives the usual proteid reactions with Millon's reagent, with nitric acid, and with the biuret test. A beautiful violet colour develops on dissolving it in concentrated hydrochloric acid, and a similar colour with warm fifty per cent. sulphuric acid. On boiling in aqueous solutions, gliadin coagulates and becomes insoluble in alcohol and in 0.2 per cent. sodium solution. GLUTENIN (3.9 per cent.) is very similar in composition to gliadin, and might be regarded as an altered and insoluble form of it, but there is no evidence that the latter is actually transformed into glutenin, and the two substances are probably quite distinct. EDESTIN, the globulin, belongs to the vegetable vitellins. It is soluble in saline solutions, from which it is precipitated in dilution, or by saturating with magnesium or ammonium sulphate, but is not precipitated on saturation with sodium chloride. The wheat kernel contains about 0.65 per cent. of edestin. LEUCOSIN is an albumin, forming about 0.26 per cent. of the wheat kernel. It coagulates at 52°, and is unlike animal albumin in being precipitated by saturating its solutions with sodium chloride or magnesium sulphate. The proteose present occurs to the extent of 0.3 per cent., and the amount of the proteose-like body was roughly estimated at from 0.2 to 0.4 per cent. Both gliadin and glutenin appear to be necessary for the formation of gluten, but these substances alone are requisite, and no ferment action seems to be involved in the process (*Journ. Am. Chem. Soc.*, pt., 524).

C. Friedel has been able to prepare compounds of sulphur and phosphorus, belonging to a new series, the type of which corresponds to the salts of hypophosphoric acid. Iron thiophosphosphate, $\text{Fe}_2\text{P}_2\text{S}_6$, occurs in greyish-black hexagonal plates resembling graphite; the copper salt, $\text{Cu}_2\text{P}_2\text{S}_6$, forms small scales; aluminium and zinc yield white and pale blue compounds respectively; whilst the thiophosphates of lead, silver, mercury, and tin were also been obtained and are duly described in a paper (*Comp. rend.*, cxxi., 260).

Atomic Weight of Carbon.

In a paper read before the British Association, Wanklyn and Cooper announced that the results of a lengthy investigation conducted by them indicate that the atomic weight of carbon should be taken as 6 and not 12, as commonly supposed. A number of hydrocarbons existing in commercial Russian kerosene would require, with the present notation, to have their formulæ written with fractions, whereas, regarding the quantity of carbon in the standard volume as a multiple of 6, this difficulty at once disappears. In an additional note in the *Chemical News*, J. A. Wanklyn states that, according to his view, carbon is triatomic, all the compounds conformable with the ordinary theory being thus embraced, in addition to carbonic oxide, the case of which is difficult of explanation "by chemists who write carbon with an atomicity of 4 and an atomic weight of 12." According to Wanklyn, carbonic oxide is quite regular, being the analogue of nitrous oxide, thus:—



Carbonic Oxide.



Nitrous Oxide.

In the discussion which followed the reading of the paper at Oxford, Professor Odling seemed to express the views of the meeting by stating that the evidence offered was too slender for chemists to give up well-established conclusions and be convinced that the atomic weight of carbon was 6 rather than 12. The determination as 12 was based on such a mass of converging evidence that it would require a very great deal to upset it, and much more than the boiling points and vapour densities of the new hydrocarbons must be known before arriving at a conclusion of such importance.

Spectrum of the Electric Discharge.

Living and Dewar have conducted experiments with a view to observing the emission-spectra of liquid oxygen, air, and nitrogen, when stimulated by the electric discharge, at temperatures of 180°–200° below zero. Platinum electrodes were employed, and in the case of oxygen the spectrum was chiefly a continuous one, brightest in the yellowish-green, but extending for some distance both on the red and blue sides. The absorption bands were conspicuous on this bright background. Much ozone was formed during the passage of the discharge, and imparted its characteristic indigo tint to the liquid. With liquid air the effects were similar, but oxides of nitrogen were produced, and liquid nitrogen gave a continuous spectrum with three bright lines in the green and yellowish-green, generally resembling those seen in liquid oxygen. For the sake of comparison the spectrum of the spark in distilled water was observed. This also was continuous, with the red line (C) of hydrogen conspicuous, and the F line just visible, and glimpses of the three platinum lines in the green and yellowish-green. The bright lines seen in all cases were traceable to the electrodes, and it seems not unlikely that the continuous spectrum was due to particles thrown off them (*Phil. Mag.*, xxxviii., 235).

Acids of Beeswax. T. Marie describes a method for the extraction of the free acids in beeswax, which gives good results if it is applied to mixtures of acids, so long as bodies belonging to other organic series are absent. Beeswax, when treated by boiling alcohol, yields to this solvent not only the free acids present, but also hydrocarbons, oleic compounds, colouring matters, and myricin, which are difficult to separate properly. The method adopted for obtaining the acids free from these other substances is as follows:—After the wax has been treated by the boiling alcohol, the greater part of the latter is subsequently distilled. The cooled and crystalline residue is then squeezed to separate oleic compounds and colouring matters, after which the solid cake is melted, washed repeatedly with boiling water, and further decolorised by charcoal and filtration through paper. The slightly yellow mass thus obtained melts at 70°. This, after being heated with potash and lime, is cooled, powdered, and mixed with a large quantity of water, which is then heated to ebullition. Dilute hydrochloric acid is then added to neutralise the alkali, and the free acids of the wax combine with the soluble calcium salts in the mixture to form insoluble compounds. The latter are separated, washed, and dried, then treated with boiling alcohol and benzine to remove neutral substances, and decomposed. The acids thus isolated, after crystallisation from alcohol, which removes a small quantity of palmitic acid formed from the myricin, melt at 79°–80°. By further treatment, with methylic alcohol, cerotic acid is dissolved out, and on crystallising is found to melt at 76°, the melting point being raised to 77°·5 after a single crystallisation from ethylic alcohol. The residue melts at 78°, and contains melissic acid, described as identical with that extracted from carnauba wax by Story-Maskelyne and Pieverling. Crude cerotic acid is said to contain from 30 to 40 per cent. of analogous acids, and Marie announces his intention of further studying the pure compound and its derivatives (*Comp. rend.*, cxix., 428).

Isocampholic Acid. This is a compound obtained by C. Friedel, which has the same composition as campholic acid— $C_{10}H_{16}O_2$. It is found in the residue left on preparing the latter, and is a colourless oily liquid with a disagreeable odour, recalling that of valerianic acid. It boils at 180°–181°, has a density at 0° of 0·9941, and its rotary power is $[\alpha]_D = +24^\circ 38'$. The acid is almost insoluble in water, but it mixes with alcohol and ether, and its salts crystallise readily from any of these liquids (*Comp. rend.*, cxix., 278).

Essence of Pelargonium. Barbier and Bouveault assert that Bertram and Gildmeister are wrong in concluding that the lemonol of *Andropogon schœnanthus*, the alcohol of essence of pelargonium, and the rhodinol of otto of rose are identical. The alcohol provisionally termed the rhodinol of pelargonium possesses a strong odour of roses, has a density of 0·8866, and is associated with another compound, greatly resembling licaeol. Altogether, it is found that the essence of pelargonium contains six different substances, the rhodinol-like alcohol predominating. The constitution of this alcohol is considered in a subsequent paper by the same authors (*Comp. rend.*, cxix., 281 and 337).

Sensitive Copper Reaction. P. Sabatier, whilst experimenting with the bromide and other compounds of copper, noted that a very intense coloration was produced on dissolving a little of the bromide in concentrated hydrobromic acid. The colour is due to the formation of a purple hydrated compound, and he bases on its formation a very sensitive test for copper salts, since it is quite appreciable when a single drop of an aqueous solution of a copper salt, containing one part of copper in 30,000, is added to a cubic centimetre of colourless, concentrated hydrobromic acid. The delicacy of the reaction is somewhat impaired by the presence of free bromine, the colour of which masks the lilac tint, but on heating the liquid to ebullition the latter becomes apparent as the bromine is driven off. If desired the concentrated hydrobromic acid may be replaced by potassium bromide in a saturated solution of orthophosphoric acid. On adding a drop of a copper solution to this, heating to 100°, and then cooling, the coloration is distinctly visible, its intensity depending on the proportion of copper present (*Bull. de la Soc. Chim. de Paris*, [3], xi., 683).

Iodides of Mercury. Berthelot refers to the two isomeric forms of iodide of mercury—red and yellow—and remarks that without doubt, on the condensation of the vapour of the compound, the yellow iodide is directly formed, but contact with the least trace of the red iodide suffices for the conversion of the whole into the more permanent state. It must be considered, therefore, that the yellow iodide is only stable at the temperature at which the vapour condenses. On cooling to the ordinary temperature it becomes so unstable that contact with the normal crystals is sufficient to determine the transformation of the yellow into the red compound (*Bull. de la Soc. Chim. de Paris*, [3], xi., 748).

Citric Acid in Milk. L. Vaudin shows that citric acid exists in cows' milk in the form of an alkaline citrate, which serves to keep in solution the calcium phosphate; that the alkaline citrates and phosphates and calcium phosphate are present in the liquid in proportions which are relatively definite. Cows' milk contains from 1·0 to 1·5 Gm. of citric acid per litre, and mares' milk from 60 to 80 Cgm. per litre. Vaudin is of opinion that the acid is formed in the mammary gland at the expense of the lactose, and that the citrogenic function of the gland, variable in different species, assures the partial solubility of the calcium phosphate contained in the milk (*Ann. de l'inst. Pasteur*, viii., 502).

New Organic-metallic Compounds. G. Perrier describes new organic-metallic compounds of borneol and camphor. The first is formed, by combination of borneol with anhydrous aluminium chloride, at a temperature of 110° to 120°. A liquid is thus obtained which on cooling forms a yellowish-brown crystalline mass. Borneol is liberated when this mass is treated with water. The crystals of the new compound are said to correspond to the formula $(C_{10}H_{16}O)_2Al_2Cl_6$. Camphor under similar conditions yields a compound in small plates, having the formula $(C_{10}H_{16}O)_2Al_2Cl_6$, and monochlor-camphor with aluminium chloride forms pearly white plates of a compound— $(C_{10}H_{15}ClO)_2Al_2Cl_6$ —that is unstable when exposed to air or moisture (*Comp. rend.*, cxix., 281).

Phosphorescence. It is found by H. Jackson that many substances which are phosphorescent remain so when prepared in as pure a condition as possible, but the brilliancy of the phenomenon is influenced by the method of preparation of the compounds. Thus, lime prepared from pure precipitated calcium carbonate in the crystalline condition was strongly phosphorescent, but when the carbonate was rapidly treated while in the amorphous condition, the lime from it hardly glowed at all. Similarly variable results were obtained in the case of barium carbonate, and it would, therefore, appear that, "according to the conditions of its preparation, an apparently pure substance may or may not phosphoresce, or the colour of its glow may not always represent rays of the same range of wave-length" (*Journ. Chem. Soc.*, cccxxx., 734).

Hydraryl in Plants. A. Bach demonstrated some time ago that, under the influence of solar radiation, carbonic acid is decomposed in chlorophyll-bearing plants into formic aldehyde and an oxidising body whose action is analogous to that of hydrogen peroxide, but a number of experiments recently performed, when the usual reagents for the latter compound were applied, fail to prove conclusively that it actually exists in plants (*Comp. rend.*, cxix., 286).

Starch in Cacao. Professor E. S. Bastin finds that the starch grains in different varieties of cacao—Ariba, Tabasco, Surinam, Bahia, Machalle, Grenada, Trinidad, Maracaybo, Java, and Caracas—are essentially alike, and agree with the following general description:—Grains spherical, or nearly so, when simple; hilum central, usually quite distinct and sometimes fissured; fissure simple and straight, or curved, angular, or stellate; one or two usually distinct lines about the hilum, but no other marks on the grain, some of which may be compound. Though closely resembling each other, the starches of the cacaos are quite unlike those of drugs generally, and sufficiently characteristic to be distinguished from starches added as adulterants. The grains seem to vary from 1 μ to 10 μ in diameter, and they show a structure that is very distinct for such minute structures (*Am. Journ. Pharm.*, lxvi., 369).

Organic Acids in Plants. In a paper written in Russian, K. Purjewicz shows that the decomposition of organic acids is always taking place in plants, but is especially favoured by (1) the influence of light; (2) the influence of a high temperature; and (3) continuous exclusion of light at the ordinary temperature. A production of organic acids takes place in all plants in the dark when the temperature is not too high (12°–15° C.), but is dependent on the previous formation of carbohydrates in the light, and results from their incomplete oxidation. Further oxidation destroys them, with production of carbon dioxide. The acid formed in the *Crasulaceae* is malic; in *Pelargonium* and *Oxalis*, oxalic; whilst in *Robinia*, tartaric and citric acids are found. Malic acid is the most easily decomposed by a strong light and high temperature; next, malic and tartaric acids; while citric acid is the most stable (*Beihfte zum Botanischen Centralblatt*, 1894, p. 368).

Irrito-Contractility in Plants. In a lecture delivered at the Biological Laboratory of Wood's Hall, Mass., Professor J. M. Macfarlane described experiments made on sensitive plants, from which he draws the conclusion that in the animal, as in the vegetable kingdom, we have to do with a true contractile tissue. In the higher plants this tissue is made up of cells, each consisting of an irrito-contractile protoplasmic sac enclosing a quantity of sap, each cell being joined to neighbouring cells by protoplasmic processes which pass through minute pores in the cell-walls. Irrito-contractility may be started by stimuli of a mechanical, chemical, thermal, luminous, or electrical nature. In the case of mechanical stimuli, like that of the leaves of *Dionaea*, two successive stimuli are necessary to start contraction. The contractile tissue is not limited to the bristles, but extends over the whole upper surface of the leaf. The seat of the contractility is unquestionably the vacuolated protoplasm, and not the cell-wall, as held by some writers. The degree of contraction of an organ is proportional to the relative molecular activity of the protoplasm, and to the strength or continuity of the stimulus. There is a very close analogy between the sensitiveness displayed by tendrils and by the tentacles of *Drosera*, both being sensitive to contact as well as to impact.

Fungi of Favus. Drs. Biro and Jessner have investigated the various forms assumed by *Achorion*, both in the native state and under cultivation, and have arrived at somewhat different conclusions. According to Biro the fungus consists of a mycelium composed of branching hyphae, which produce spores. The best staining reagents are eosine and hæmatoxylin. Under cultivation the three so-called species, *Achorion entythrix*, *A. atacton*, and "Biro's fungus," yielded identical results. The parasite enters the hair-sac, finds its way between this and the surrounding peripheral portion, raises up the epidermis, and is seen through the raised epidermal layer as a yellow dot. He considers that there is no ground for the conclusion that there are several favus fungi. Dr. Jessner, on the other hand, while identifying *Achorion atacton* and *A. entythrix*, regards *A. dikroon* and *A. schenleinii* as distinct species. He thinks it possible, however, that the different species may have the same origin, and may be the final products of a metamorphosis, the result of the influence of varying vital conditions (*Centralb. für Bakt. und Parasit.*, 1894, pp. 69–71).

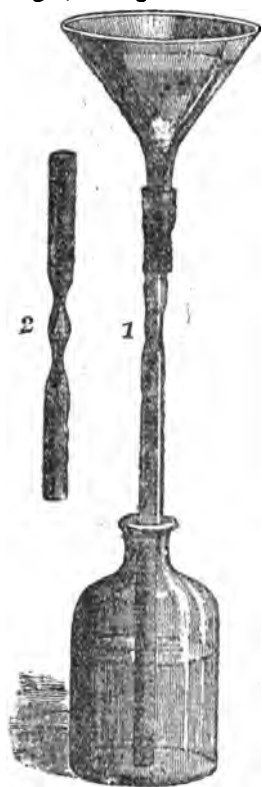
Varieties of Chlorophyll. Two years ago, A. Etard described a method of investigating the constituents of green plants by separation into groups (see *Pharm. Journ.* [3], xxiii., 42). Continuing his researches on this subject, he finds that living lucerne, *Medicago sativa*, contains about 30 Mgr. of green pigment per kilo., and that this pigment contains four distinct varieties of chlorophyll, descriptions of which are given in his paper (*Comp. rend.*, xix., 289).

APPLICATION FOR A PATENT FOR A MEDICINAL COMPOUND.

The following appears in the official list of applications for June 23, 1894:—
12198.—Medicinal compounds for the treatment of Gonorrhea. By William Henry Greer, 89, Chancery Lane, W.C.

RAPID FILTERING APPARATUS.

The following very simple and effective filtering apparatus has been designed by Mr. George A. James, chemist, of Selby, Cal. A glass tube of any convenient length, having a contraction near its upper end, is



Rapid Filtering Apparatus.

connected with the small end of the funnel by a short piece of rubber tube. The lower end of the glass tube is inserted in the bottle or other vessel which receives the filtered liquid, and the funnel is supported by a filter stand (not shown).

The contraction in this case is made by flattening the tube so that its sides approach each other to within a very short distance, say $\frac{1}{16}$ of an inch. This contraction prevents air from entering the part of the tube below the contraction, and thus a solid column of liquid is maintained below the contraction. The liquid by its weight produces a partial vacuum in the tube, and thus allows the air pressure on the liquid in the funnel to force the liquid through the filtering medium. The rapidity with which the filtering is accomplished depends upon the length of the tube, other things being equal.

In Fig. 2 is shown a modification of the apparatus, in which the tube is contracted evenly all around in two places, leaving a small circular opening instead of a flat one. Experience shows the flattened tube to be preferable.—*Scientific American*.

EXPORT OF GUM FROM JEDDAH.

The exportation of gum is diminishing every year. Jeddah gum is of a good quality, though not equal to that of Kordofan, which is nearly white and more friable than that which is found in this district. But it is not so much any defect in quality that is the cause of the yearly diminishing exportation of this article; it is the tremendous falling off of late years in the demand for gum arabic. I am informed that the chief reason of this is that, in most respects, an admirable substitute for gum arabic has recently been found in Madagascar and in some parts of North America which is infinitely cheaper. In point of adhesiveness the newly-found gum is quite equal to that which comes from this country, though it is far from being so pure. In this latter respect gum arabic is without a rival, and on that account will always be sought for by chemists and others to whom this qualification is a *sine quâ non*.—*Consular Report*.

British Medical Association.**"REPORT OF THE THERAPEUTIC COMMITTEE.**

During the past year the Therapeutic Committee have concluded their inquiry regarding the frequency and importance of ill-effects following the use of the three chief antipyretic agents—phenazone (antipyrin), acetanilide (antifebrin), and phenacetin; and they herewith submit their completed report.

"A draft of this report was submitted to the Council at their last annual meeting; but in the complete report now presented much new matter has been added.

"The Committee consider that the inquiry has yielded much-needed information, supplying, as it does, clear evidence that, both as regards their frequency and importance, the statements made regarding these ill-effects have been considerably exaggerated, most of all so in the case of antipyrin and phenacetin.

"The ill-effects observed, when not obviously due to idiosyncrasy, have in the majority of cases been the direct result of injudicious or excessive dosage. This has especially been the case with antifebrin, with which drug the ill-effects have been the most frequent and serious. The dosage employed by no fewer than three-fourths of observers (four to ten grains) has been habitually excessive, the proper dose of this drug being from one to four grains.

"In view of the issue of a new edition of the Pharmacopœia, the Committee have thought they would be furnishing valuable information if they ascertained from the Association the extent to which certain of the more obsolete drugs and preparations are now employed. A report containing a list of such drugs has been made to them for their Pharmacopœia Sub-Committee; and an inquiry to the whole Association is now in course of being issued.

"The Committee has also in the same relation undertaken investigations with regard to the dosage of certain of the older remedies.

"WILLIAM HUNTER, Honorary Secretary."

"Extract from *Minutes of Therapeutic Committee*,
June 29, 1894:—

"The following resolution was directed to be conveyed to the Council. The Therapeutic Committee request the Council that they be reappointed, and that they be allowed the sum of £50 (Fifty Pounds) for their expenses during the coming year. They would also request that the names of Dr. C. D. F. Phillips and Dr. W. Hale White be added to the Committee.

"D. J. LEECH, Chairman."—*Brit. Med. Journ.*

OTTO OF ROSES IN BULGARIA.

The yield for 1893 was a good one, and amounted in round numbers to 2000 kilos. (4400 lbs.). Buying prices ranged from 900 fr. to 1100 fr. per kilo., according to quality, and selling prices from 1100 fr. to 1200 fr. per kilo. About two-thirds of the total yield was exported during the year, and the value of this added to the portion of the 1892 yield, which was held over till the following year, would bring the total value of the year's export to at least £65,000. . . . The otto went as usual to France, Germany, England, and the United States. The outlook for the present year is very promising, and a large yield is anticipated.—*Consular Report*.

The Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, SEPTEMBER 1, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge,—17, Bloomsbury Square, London, W.C.

THE SALE OF MEDICINAL PREPARATIONS CONTAINING POISON.

THOUGH no positive intimation has yet been received as to whether the defendant in the case of the Pharmaceutical Society *v.* ARMSON intends to abandon the hope of securing a reversal of the original judgment against him, it would appear from the tone of a leading article in the latest published number of the *Patent Medicines Journal* that such is probably the case. It is there accepted that, the strongest convictions to the contrary notwithstanding, the notion that the meaning of the term "patent medicines" in the Pharmacy Act of 1868 was intended to cover all proprietary medicines must now be regarded as entirely exploded. "The case referred to resulted in a great victory for the Pharmaceutical Society, and is one more nail in the coffin of 'patent' medicines. We should be failing in our duty to the great body of our subscribers if we made the slightest attempt to minimise this judgment or to underrate its probable effects. In the future procers must abstain from vending any preparation into which any of the scheduled poisons enter as ingredients, and our advice to them is, to at once withdraw every such article from their stock. There should be no delay in taking this step in obedience to the ruling of the powers that be, and any dallying will surely be attended with considerable danger."

It is, of course, very satisfactory to find that the result is thus freely accepted by our contemporary, though the idea suggests itself that the writer may be somewhat hasty in accepting the result as a foregone conclusion, for the fact must not be overlooked that nothing has been settled by the Court of Appeal that was not already decided by the Queen's Bench Divisional

Court, the judgment of the latter being simply emphasised without amplification. As a matter of fact, it would be to the interest of all parties concerned were a further notice of appeal lodged and judgment finally delivered by the House of Lords. If this should not be done, however, the result will be final, so far as it goes. At the same time, it would be idle to suppose that the decision will be accepted by all concerned as a settlement of the whole question of the sale of medicinal preparations by individuals not registered as chemists and druggists, and it may be anticipated that the issue will be once more raised in connection with the sale of some less potent preparation than that which was rendered prominent in the case under notice. Be this as it may, however, it is, as already remarked, satisfactory to find that the immediate decision is likely to be honourably accepted by at least a section of those who must be regarded as the actual defendants in the case.

A strong protest must be lodged here against the repetition in the same article of the perverse misstatement that "these prosecutions were instituted by the Pharmaceutical Society with the object of securing a monopoly" in the sale of medicines containing poison. So far from this being the case, it is well known that the Society, though possessing the power to institute such proceedings, took no steps in that direction for a considerable number of years after the passing of the Pharmacy Act of 1868. The first movement in the matter was made by the Treasury authorities, instigated by the British Medical Association, which felt constrained, in the interests of the public, to seek to put a limit to what was regarded by many medical practitioners as a widespread and increasing evil. The result having shown that that which was previously considered doubtful was distinctly illegal, the Pharmaceutical Society was urged, as the only body possessing full powers under the Statute, to take such action in the matter as appeared necessary and desirable. This has been done, and in time the proceedings, which are necessarily obnoxious to all persons inclined to infringe the Statute, cannot fail to result in considerable benefit to the public, whilst a proper recognition of their services and position may be looked for by the medical profession and pharmacists.

PHARMACEUTICAL FELLOWSHIPS.

At the meeting of the American Pharmaceutical Association held in 1892, Dr. FR. HOFFMAN suggested the establishment of pharmaceutical fellowships. He pointed out that in a paper that had just been read by Professor KREMERS it was shown that no less than eighteen of the professors teaching pharmacognosy, in the schools of pharmacy then existing in the United States, possessed little or no pharmaceutical education or experience. By

the abolition of school prizes and the endowment of fellowships, he urged that this abnormal condition would in time be changed, as the present generation of teachers might then be succeeded by "men of riper scholastic and pedagogical training, at the same time familiar with the practice and the details of pharmacy from the bottom up to the highest round of the educational ladder."

In a recent number of the *Pharmaceutische Rundschau* this idea is elaborated by Professor KREMERS, who remarks that there is certainly no reason why the pharmaceutical profession should not choose teachers from its own ranks, though at present this appears to be impracticable to a deplorable extent, the reason being, no doubt, that such a limited number of pharmaceutical graduates pursue advanced studies. He considers that the prize system is largely a failure, and that if the money now spent in that direction could be used for foreign or travelling fellowships, it would serve the double purpose of award and stimulus. As awards the fellowships should be granted for original work embodied in a thesis, and in the hope of obtaining it many graduates would remain in college an extra year or more, after completing the prescribed course. Each fellowship would also serve as a stimulus for advanced and original work to all who intended to compete for it, and thus its benefits would not be confined to the actual holder alone.

As regards the conditions attaching to the fellowships, it is suggested that they should be tenable abroad for two or three years. Home fellowships are regarded as undesirable. Much valuable knowledge would of necessity be obtained during a two years' stay at a foreign university; there are also many problems in pharmacognosy requiring a thorough study of the drug-yielding plants in the countries where they are indigenous or cultivated; and other possibilities of such fellowships are innumerable and inestimable. Finally it is pointed out that, if a dozen educated and energetic young pharmacists were thus collecting information and gaining wisdom throughout the world, the schools of pharmacy would be greatly benefited, and in the course of time enabled to select thoroughly competent instructors from the ranks of their own graduates.

PHARMACEUTICAL EXAMINATIONS.

INTENDING candidates for the Major, Minor, and Modified examinations should note that the Boards of Examiners in England and Wales, and in Scotland, will meet respectively at 17, Bloomsbury Square, London, and at 36, York Place, Edinburgh, in October, for the purpose of conducting the oral portions of the above examinations, whilst the written and practical portions of the examinations will commence in the last week in September

in London and in Edinburgh. They must give notice to the Registrar, and pay the fees to him on or before September 15 next. The First examination will be held at 11 a.m. on Tuesday, October 9. Candidates must give notice to the Registrar on a printed form of application, which can only be obtained from him, and this notice, together with the fee, must be in his hands on or before Tuesday, September 25 next. For full particulars in all cases apply to the Registrar, Mr. RICHARD BREMRIDGE, 17, Bloomsbury Square, W.C.

THE USE OF TEETHING POWDERS.

AT an inquest held at Wolverhampton last week the evidence showed that a child three years old died shortly after the administration of a teething powder, prepared by a wholesale firm, and sold by a grocer. The contents of the powder are not specified in the report of the case, but the medical practitioner who was called in stated that death was due to tubercular disease accelerated by the administration of the powder, which he considered a dangerous one to be administered without the advice of a medical man. The powders made from the same formula were generally unsuitable for children. The jury returned a verdict to the effect "that deceased died from tubercular disease of the mesenteric glands, accelerated by a powder containing elements of an unsafe character, and that such powder was administered without any knowledge of its nature."

AMERICAN PHARMACEUTICAL ASSOCIATION.

THE annual meeting of this association will be held at Asheville, North Carolina, on September 3 to 8. The reception on the first day will be followed by a literary and musical entertainment in the evening, and numerous pleasant excursions have been arranged for the subsequent days.

LIBRARY AND MUSEUM IN LONDON.

MEMBERS and Associates of the Society should note that the Library and Museum at 17, Bloomsbury Square, will be closed from September 1 to 10 inclusive.

PROCEEDINGS UNDER THE PHARMACY ACT.

AT the Gloucester County Court, on Tuesday, W. O. DAVIS, trading as DAVIS and Co., proprietor of a small drug store, was sued, at the instance of the Pharmaceutical Society, for selling sheep dip containing arsenic, he being an unregistered person (see p. 188). It was alleged, in defence, that the powder was obtained by the defendant from chemists as he required it, done up in packets ready for sale. There were three offences charged: keeping open shop for the retailing of poisons; selling poisons, not being a registered chemist; and unlawfully using the title of chemist—and a penalty of £5 was imposed for each, with costs.

British Pharmaceutical Conference.

MEETING AT OXFORD. SECOND DAY'S PROCEEDINGS.

(Continued from p. 168).

The next paper was on—

ANIMAL EXTRACTS.

BY C. E. STUART, B.Sc.

Notwithstanding the investigations and statements of continental observers, the employment of extracts of animal origin in the treatment of disease had made but slow progress in England up to 1891. In that year, however, Dr. George R. Murray, of Newcastle-on-Tyne, treated a case of myxœdema by the hypodermic injection of an extract prepared from the thyroid gland of the sheep, and the phenomenal success which resulted is undoubtedly one main cause of the large amount of attention which has since been directed to various animal extracts. As it is the duty of the pharmacist to make himself acquainted with the origin, nature, and properties of every substance which the medical man may require to use in the treatment of disease, whether animal, vegetable, or mineral, I hope the following brief and incomplete memoranda and notes will not be considered out of place as a communication to this Conference.

The hypothesis on which rests mainly the use of animal extracts as curative agents is that of Brown-Séquard, namely, that "all the glands of the body, whether they have excretory canals or not, give to the blood useful principles, the absence of which is felt when those glands are extirpated or destroyed by disease." Later he, with D'Arsonval, extended this hypothesis to all parts of the body, and proposed to employ in the human being, whenever the action of an organ is wanting, liquids extracted from the same organ taken from animals in good health. Thus the testicle, in addition to its secretion containing spermatozoa, which passes away through the ducts provided for the purpose, is supposed to secrete also a watery fluid which is constantly being absorbed into the blood, and acts as a stimulant nerve tonic. Consequently Brown-Séquard advocated injection of this fluid into the system whenever symptoms indicated the need for such a tonic.

Again, it is stated that such glands as the ovaries, pancreas, kidney, have in addition to their own excretory functions also an influence in the general physiology of the system, through the medium of liquid secretions taken up from them by the blood. For example, a form of diabetes is believed to be connected with disorder or destruction of the pancreas. In certain animals extirpation of the pancreas produces this form of diabetes. It is not, however, the loss of the pancreatic juice which enters the intestine through the duct of the pancreas to which the disease must be attributed, for ligaturing this canal does not produce the diabetes; hence the inference that the pancreas has an internal secretion which is of importance to the animal economy.

If we consider the ductless glands, the thyroid affords a typical example of the value of these internal secretions, and also of the success which follows the introduction of extracts from healthy glands into a patient who is suffering from the impairment or loss of function of his own glands.

As regards the nature of the secretions, the difficulty of isolating any definite substance from them is very great. The inorganic constituents do not present any remarkable feature, and the organic constituents are, as a rule, present in small quantity, and tests for their identification are vague and unsatisfactory.

Even if separated and identified, it is not to be assumed that any product is an "active principle" until it has been subjected to careful and prolonged physiological and clinical tests.

The action of these secretions in the system has been assumed by Poehl to be due to the supposed presence in all of them of one principle typically met with in the testicular secretion, to which has been given the name spermine. This is absorbed into the system, and confers its special tonic powers. Spermine is a base which was discovered by Schreiner in the animal semen. It has been shown to be present in the thyroid body, pancreas, spleen, and ovaries, and it appears to be a normal constituent of the human body and circulates in the blood. However active it may be as a general tonic, it cannot, I think, be considered to be efficacious in cases of disease due to arrested function of special glands, such as the thyroid or the pancreas.

Another suggestion is that each gland has its own special active principle, which may be a ferment or an albumose; or, again, in certain cases it has been suggested that there are organic compounds of phosphorus which have been supposed to exert a tonic action.

Animal tissues in their normal healthy condition are aseptic, and it is therefore only necessary to pay the most scrupulous attention to cleanliness and antiseptic conditions to produce extracts which may be safely used. The required gland or organ must be dissected out from the body with knives and forceps which have been sterilised in the flame of a bunsen burner, and the glass plates, glass mortars, measure glasses, scale pans, and every other article used must be cleaned with soap and water and rendered aseptic by soaking in a 5 per cent. solution of carbolic acid, and rinsing with a plentiful supply of distilled water which has been sterilised by boiling. The hands and arms of the operator should be scrubbed with soap and water, washed in the 5 per cent. carbolic water, and finally with sterilised water.

Thyroid Extract.

In making this the formula originally published by Dr. Murray is adhered to, because it furnishes a preparation which is active, concentrated, and retains its activity for a reasonable time, and also because it is essential for the manufacture of a good extract that absolutely fresh glands shall be used.

In preparing the glands it is best to get them cut from the freshly killed sheep rather than to trust to the butcher to send them in at his convenience, possibly after a few days delay. As regards the small cysts occasionally found in the lobes, the matter they contain is not pus, but seems to be of a fatty nature, they are, however, for the sake of caution, better left out of the extract. Hypertrophied lobes, such as may be met with from time to time three or four inches long, should also be rejected.

The lobes after being cleaned from fat and connective tissue are sliced thinly and bruised in a mortar; for every lobe is added 1 C.c. of glycerin and 1 C.c. of sterilised water. The mixture is allowed to stand for twenty-four hours, and is then squeezed off through fine calico. The product measures 3 C.c. for every lobe, and is a thick, dull red, cloudy liquid.

For hypodermic use water containing 0.5 per cent. of carbolic acid takes the place of the plain water.

A powder which keeps well may be made by simply expressing the juice from the glands, mixing it with sugar of milk, spreading it in a thin layer on glass plates, and drying at 90° F. The weight of the dry powder may be made up to 1 gramme for every thyroid lobe employed. This is three times the strength of the liquid extract.

The investigation of the constituents and active

principle of the thyroid gland has had results which are chiefly of a negative nature. According to Dr. Gourlay, 'Journal of Physiology,' vol. xvi., No. 1, the thyroid extract contains—

1. A nucleo-albumin, coagulating at 50° to 57°, precipitable by magnesium sulphate and also by water from the gland pounded up with salt.
2. Very little proteid.
3. No mucin, the nucleo-albumin having been mistaken for this.
4. No proteose or peptone.
5. Possibly a ferment.

I have confirmed the first four results, but it is to be noted that the biuret reaction, indicating proteose or peptone, "rose-pink colour on the addition of traces of copper sulphate and some sodic hydrate," is readily obtainable if the thyroid lobes are not fresh.

As regards Dr. Gourlay's suggestion, "with all reserve," that the nucleo-albumin may be the active principle since it is found in the peculiar secretion of the gland, because it is the only part of the tissue that resists (partially at least) gastric digestion, I would remark that nucleo-albumin is not peculiar to the secretion of the thyroid, but may be obtained from almost any cellular organ, and it remains to be shown that this particular nucleo-albumin has properties differing from that obtained from any other source. Also, that it is quite possible that bodies which are destroyed by artificial digestion may be absorbed into the system through the stomach walls without change.

As regards the presence of a ferment, the powder prepared as described by Mr. White in his paper read before the Conference last year, by precipitating with calcium phosphate an aqueous extract of the gland, is stated to be active, and may contain a ferment. In my own experiments in search of the active principle, the following process has been adopted at the suggestion of Dr. G. Murray. One hundred thyroid lobes were sliced fine and allowed to stand for several weeks in absolute alcohol. The alcohol was poured off and the glands dried, when they were extracted with water. The aqueous extract was evaporated under reduced pressure at 30° C. to a small bulk, and poured into ten times its volume of absolute alcohol, producing a copious grey precipitate. This precipitate was again extracted with water and poured into alcohol, giving a second precipitate of less bulk, on which the extraction and precipitation were repeated, and the final alcoholic precipitate was dried and powdered. This process coagulates or gets rid of proteid and nucleo-albumin, together with lecithin and fat, and probably excludes bodies other than a ferment; but as to the proof of this being one, no experiment parallel to those which can be made in the case of others is available. We must wait for physiological proof of its activity, and experiments in this direction are being conducted by Dr. Murray. The powder from 100 glands weighs 792 grammes.

With respect to an improved formula for the preparation of thyroid extract, there is at present no published evidence that any method of preparing it gives better results than Dr. Murray's original formula.

Brain Extract.

The method I have used for the preparation of a brain extract has been to take the brain of a rabbit, slice it, and rub it in a mortar with 1 cubic centimetre of glycerin, and 1 cubic centimetre of 0.5 per cent. carbolic acid to every gramme of its weight. Allow to stand twenty-four hours, and squeeze with strong pressure through fine linen. This is somewhat similar to the method of preparation used by Babes, who made an emulsion of the sterilised brain with five parts of bouillon ('Deutsche Med. Woch.,' July 28, 1892).

The product is a pinkish white emulsion, consisting of almost the whole brain substance, there being left on the linen chiefly membrane. In seventy rabbits I find the average weight of the brain to be 8.5 grammes, the highest being 11.7 and the lowest 7.2 grammes, and the average yield of the cerebrine alpha was 23.5 C.c. The S.G. of the extract is 1.067. Ten minim doses of this extract have been injected with good effect in cases of neurasthenia, locomotor ataxy, and other nervous cases.

This preparation contains in solution a little proteid, and in suspension protagon, lecithin, cholesterol, and cerebrin, and is most interesting on account of its complex character, the definite nature of its chief constituents, and the freedom from irritation and abscess following on the injection of its considerable proportion of solid matter under the skin.

Dr. J. Althaus in his paper on this extract (*Lancet*, December 2, 1893), which, as above prepared, he calls cerebrine alpha, suggests that its action on the nervous system may be two-fold, and due, first, to the injection of a highly specialised pabulum of nervous matter; and second, to the decomposition of the lecithin and protagon which it contains through the alkali of the blood into choline, glycerophosphoric acid, and stearic acid. Choline is an alkaloid which acts as an antitoxin by reason of its oxidising action on the blood. In small doses it produces pyrexia.

It is an interesting fact in this connection that Dr. A. Robin, of Paris, has recently published successful results of the use of glycerophosphoric acid and its salts in nervous cases (*Lancet*, May 5, 1894). Hence both the choline and the glycerophosphoric acid may be active in the extract.

Spinal Cord Extract.

This is similar in its nature and effects to the brain extract. Its preparation is more troublesome, as the spinal cord must be obtained by carefully cutting away the upper portion of the vertebrae of a rabbit with a bone forceps until the whole cord is exposed, when this may be lifted out together with the medulla oblongata; the arachnoid membrane may readily be stripped off and the cord divided and treated as the brain extract. Dr. Althaus has named this myeline alpha to distinguish it from the histological "myeline," a constituent of the central nerve fibre. The average weight of the spinal cord I found to be 4.68 grammes, the highest being 6.2 grammes, and the lowest 3 grammes, and the average yield of myeline alpha was 12.3 C.c.

Spleen Extract.

On opening the body cavity of the rabbit in the usual position for dissecting, and moving the bowels to the left, the spleen will be seen as a narrow reddish-brown organ lying just behind and across the stomach, which is easily dissected away from the peritoneal membrane in which it is folded. It has a characteristic bright red colour and varies considerably in size, being from 1½ to 2½ inches long, and from ½ to ¾ of an inch in diameter. It weighs on an average .89 gramme. An extract may be prepared from it by rubbing it up with enough of a mixture of equal parts of glycerin and ½ per cent. carbolic acid to make, after squeezing through linen, one fluid drachm of product for each spleen. This extract has been used hypodermically in doses of ten minims in leucocythæmia, enlarged spleen, and Hodgkin's disease.

Supra-renal Extract.

Immediately behind and just above the kidneys of the rabbit will be found on either side the supra-renal capsule, a small oval pale yellow body, which may easily be dissected out. In cases where the animal is very fat the organ is not so readily seen on a first inspection, but a small amount of dissection will

remains its presence, and when once it is recognised and known it cannot afterwards be overlooked. Each supra-renal body weighs on an average .25 gramme, and on cutting it across it is seen to be composed of two distinct parts, an outer, thicker, cortical part of yellowish colour, striated radially, and an inner, thinner, medullary part of darker colour. On bruising the bodies in a mortar the substance has a yellowish-brown granular appearance. The extract has been made by slicing and bruising the capsules and adding a sufficient quantity of equal parts of glycerin and a 0.5 per cent. solution of carbolic acid to make, after expression as above, 4 C.c. or 1 fluid drachm for each supra-renal body. This has been used in 10 minim hypodermic doses in Addison's disease.

Pituitary Body Extract.

The pituitary body is a small pink mass at the base of the brain. It is a very small body; in the sheep it weighs .75 gramme, and this is a convenient source for making the extract. The sheep's head is opened, and the brain removed, all nerves and connections on the under side being divided with a scalpel. The pituitary body will be found to have been left in the skull in its little depression almost covered over with thick membrane, which has to be cut away before the pituitary body can be freed. It is treated as the brain, and has been used in acromegaly.

Pancreas Extract.

The pancreas of the pig is the most convenient for making extract. It should be most carefully freed from fat, finely divided, and treated as brain extract. It furnishes a milky extract, which contains, besides the digestive ferments of the pancreas, the special secretion which preserves the organs from diabetes.

Thymus Extract.

This gland may be obtained from the sheep or pig; it is important that it should be taken from a young animal, as it atrophies in the adult. When treated as the brain it yields a thin, whitish extract, which has been used in similar cases to the thyroid extract, but with indifferent results.

Kidney Extract.

In making this extract, the kidney should be cut open and several deep incisions made into its substance, so as to allow of a thorough washing out of the pelvis of the kidney to free it from excreted matter. It may be then chopped fine and treated like the brain. I should like to remark here that as we know so little of the purpose and function of some of these organs, and absolutely nothing as to what is the active principle or principles in these extracts, an arbitrary standard of strength must for the moment be adopted and the dose adjusted to these strengths. I have been guided by the unqualified success which attended the strength adopted by Dr. George Murray for thyroid extract, and have made only slight modifications to suit the convenience of size and weight in other organs.

Bone Marrow Extract.

The development of red blood corpuscles seems to be a function which is chiefly carried on by the cells composing the red marrow of bones (Halliburton, *Chem. Phys. Path.*, p. 265). It is natural, therefore, that this promising field for the manufacture of an extract should not be neglected. Dr. Fraser read before the International Medical Congress in Rome (*Brit. Med. Jour.*, June 2, 1894) a paper in which he showed the favourable result of giving red marrow by the mouth in quantities of three ounces daily in a case of pernicious anaemia.

As the cells of the red marrow from which the red corpuscles are derived are met with chiefly in the

cancellous portion of the bones, such as the head or base of the femur, and other long bones, and less numerous in the actual fatty marrow in the hollow shafts of these bones, it is to be expected that an extract from this cancellous tissue should prove stronger in its action than the marrow itself, and therefore smaller doses be required. Dr. J. Dixon Mason publishes a note on this subject in the *Lancet*, March 10, 1894. Following his indications, an extract may be prepared by splitting the femur of a young animal, say the calf, and gouging or scooping out the red cancellous tissue at the head or base, pounding this fine in a clean iron mortar, and macerating the mass for a few days with glycerin in the proportion of one in ten with frequent agitation, when the extract is filtered through glass and made up by washing with glycerin to the necessary volume.

As the process of development of the red corpuscles is one in which the nucleated cells of the red marrow are altered, and assuming a rounded shape become blood discs and enter into the circulation, or according to another view, one in which these cells produce blood discs by a sort of budding, an explanatory hypothesis of the action of this extract must be that it contains a substance which either stimulates the energy of marrow cells already in existence, or encourages the formation of new ones.

Testicle Extract or Orchitic Fluid.

I have left this until last, because it is an extract in which I have simply followed the strength (one in ten) and process published by Professor Brown-Séquard in the '*Archives de Physiologie*.' I have used ram's testicles divested of their outer membranes, and to each gramme weight added 3 C.c. of glycerin and 6 C.c. of a 0.5 per cent. solution of boric acid. After macerating twenty-four hours, this mixture is filtered through sterilised filter paper, and then finally sterilised in the D'Arsonval apparatus, which has been described in the *Pharmaceutical Journal* (see vol. lii., 1034).

The PRESIDENT said the author of the paper was not present, he regretted to say, but as animal extracts were being demanded by medical men, it became the pharmacist not only to be able to prepare them, but to qualify himself by a knowledge of physiology and the practice of dissection to do whatever the medical man required. Mr. White, of St. Thomas's, had published some work in connection with the thyroid gland, and they had seen allusions in which editors had run greatly in advance of Mr. White's own papers about it, especially with regard to the active principle. He was not sure they always knew what they meant when they talked about the active principle, but it was well to remember that not only the pharmacist, but the chemical physiologist or physiological chemist, was working in an entirely new region, and a region of intense interest scientifically. Nothing approaching it in interest, from a scientific point of view, had ever come into his pharmaceutical life. How long it would be before they received any light on these great problems he did not know, but he did know that it was necessary for pharmacists to be capable, in connection with these animal compounds, and even bacterial compounds, of producing whatever the medical man required in the treatment of his patient. Although it was easy to sneer and smile, and to refer to the time when various animal excreta were used, probably with a certain amount of superstition, at the same time the justification of experiments with regard to other animal compounds was found in the remarkable success to which he had already referred. With regard to the care required he could not say any words strong enough to impress

on everybody who had to deal with these things not to relax it. The slightest decomposition which might occur in the thyroid glands was capable of producing the most tremendous effects of an undesirable character, and those who had read any literature on the subject would recognise that it was not a thing to be trifled with. The work should not be done on the commercial scale, but the pharmacist who managed these things must take on himself the responsibility from beginning to end, at any rate until they knew more about the chemistry of the subject. The author himself would, for several reasons, have preferred to postpone this paper for some years. At the same time, hurried as it was and imperfect, it was a valuable contribution to the Conference, and pharmacists could not begin too soon to turn their attention to things which might at any moment assume greater importance than that one extract had.

Dr. RIDEAL said one would have thought that a preliminary test for the presence or absence of ptomaines would have been sufficient to insure the pharmacist dealing with a satisfactory gland, but from Mr. Stuart's paper it would appear that it would be necessary to go further back than the presence of ptomaines in testing as to its efficiency, because he gathered from the paper that it was necessary to insure the absence of albumose and peptones, or, at any rate, bodies giving a biuret reaction, before you could be certain the thyroid gland was one which would be safe. If that were so, it was of great importance, and the conclusion arrived at by Mr. Stuart ought to be of great value to those engaged in making these preparations.

Mr. GERRARD said those who might wish to make a preparation which was perfectly accurate and reliable for internal administration might do so by taking fresh glands, carefully mincing them, removing as much fatty matter as possible with the knife, then washing out any remaining fatty matters by means of such solvents as ether or benzol, spreading the gland out thinly on a sheet of glass, and submitting it to a drying process at a low temperature. As soon as the scale was perfectly dry, if rapidly pulverised it could be sifted or mixed with a certain amount of well prepared sugar of milk; it might then be bottled, and you would be sure of having a reliable preparation which any pharmacist might prepare for himself. That, however, should not be supplied for making hypodermic injections. In such circumstances it was essential to follow out perfectly the careful process suggested by the author.

Mr. WILLIAMS said in making the preparation of the thyroid in powder a convenient method was to press the gland in a clean press, when the juice might be conveniently collected and allowed to form a thin layer on glass plates or on a large photographic plate, and dried at a low temperature. It readily scaled, and that scale could be powdered and readily used. Of course, there was much greater difficulty in following out all the precautions necessary in order to make a preparation which would be useful and safe for hypodermic injections.

The PRESIDENT said he was not competent to reply on behalf of the author of the paper, though he had paid a great deal of attention to the subject, but in reply to Dr. Rideal he might say it was not a question of the presence of ptomaines, but of the avoidance of danger, and it was safer to eliminate danger from the beginning than to trust, in their present condition of knowledge, to checking themselves by chemical means at any subsequent stage.

The next two papers were considered together—

LEONURUS CARDIACA.

BY E. M. HOLMES, F.L.S.,

Curator of the Museums of the Pharmaceutical Society.

My attention was first directed to this plant by its very bitter taste. The descriptive character of its specific name suggested that (like *Convallaria*) it might possibly possess some beneficial action on the heart, and that it would be worth while to subject it to a chemical examination, at all events so far as to determine whether its properties are due to an alkaloid or a glucoside, as the bitter principle has not been isolated.* The plant grew like a weed in the sandy soil of my garden, sowing itself everywhere, so that I was able to supply sufficient for a preliminary investigation, which Mr. W. A. H. Naylor kindly undertook.

Concerning its history as a medicinal plant there is not much to be said. The earliest herbal in which I have been able to find an account of the properties of the plant is the 'Botanicon' of Theodore Dorstenius, dated Frankfurt, 1540, in which, on p. 65, an excellent figure of the plant is given. Ten years before it was called *Marrubium mas* by Brunfels. By other authors it was called *Marrubium nigrum*, whilst *Ballota nigra* was distinguished as *Marrubium nigrum fatidum*. It is very doubtful whether the plant was known to possess medicinal properties by the early Arabian and Greek physicians. Dorstenius says that it is called *cardiaca* because it powerfully relieves palpitation and pain in the region of the heart. Culpepper, in the 'English Physician Enlarged,' published about one hundred years subsequently (1653), writes: "There is no better herb to drive melancholy vapours from the heart, to strengthen and to make the mind cheerful, blithe, and merry. The powder thereof to the quantity of a spoonful drunk in cold water is a wonderful help to women in sore travail, and also for suffocations or risings of the mother, and from these effects it most likely got the name of motherwort." He also states that it possesses diuretic and emmenagogue properties, acts as an expectorant, and kills worms, and also relieves cramps and convulsions. In J. Hill's 'Flora Britannica,' published about a hundred years later (1760), which is interesting as being the first Linnean flora published in England, the author remarks (on the authority of D. Bowle) that the plant is good for hysteria.

But *Leonurus cardiaca* seems to have been rarely used by medical practitioners. The only list of simples in a London pharmacopoeia in which I have found it is that published in 1721. It also occurs in the Paris Codex of 1758. Nevertheless, its reputation as a cardiac remedy appears to have extended to the Continent, since the names in French (Agripaumé cardiaque), German (Herzgespann), and Dutch (Hartgespann) all indicate the same property.

In answer to inquiries I have made as to its present use as a herb, I learn from Messrs. Potter and Clarke that it is still used to a considerable extent (about 1,000 annually) in England; also in the United States, and in Germany, and to a small extent in France. It is supplied in the form of herb, fluid extract, and extract. Mr. Ransom also informs me that the extract is sent to Australia. There seems to be some ground therefore for supposing that it really may be useful in medicine. The exact nature of its usefulness must of course be determined by the medical profession and by physiologists. As yet there has not been an opportunity of investigating the action of the pure active principle. Messrs. Potter and Clarke have, however, kindly offered to supply herb, fluid extract, or extract for the purposes of therapeutical and physiological investigation.

It may be added, in conclusion, than an allied species, *L. lamatus*, is (according to the authors of the 'National Dispensary,' 1890, p. 934) regarded as a vascular stimulant and as a general tonic. It is employed in dropsy, especially of hepatic origin, and is stated to impart to the urine a dark brown colour. It is also used in chronic gout and rheumatism, and to relieve internal obstruction.

In King and Lloyd's 'American Dispensary' *Leonurus cardiaca* is spoken of very highly as an emmenagogue, and is said to be of value in hysteria, nervous complaints, delirium tremens, nervous excitability, chronic diseases attended with restlessness, wakefulness, spinal irritation, and neuralgic pains. Messrs. Potter and Clarke state that in two or three cases that have come under their notice it has proved very beneficial in palpitation of the heart, etc. The evidence obtainable seems therefore to indicate that the plant is worthy of further investigation.

EXAMINATION OF LEONURUS CARDIACA.

BY W. A. H. NAYLOR.

More than a year ago Mr. E. M. Holmes, F.L.S., Curator of the Museums of the Pharmaceutical Society, handed over to me about twenty pounds of fresh motherwort, which he had grown, with the request that I would subject it to a general examination.

The fresh herb was pressed, and to its juice was added 20 per cent. of rectified spirit as a temporary preservative. After making a few preliminary tests, the following mode of procedure was decided upon. The "succus" was evaporated over a water-bath to a soft extract (A). This extract was treated by agitation with successive portions of absolute alcohol, and the several portions were united and distilled, leaving two residues, one soluble and the other insoluble in alcohol.

Aa. Residue Soluble in Alcohol.—It was noted that small crystals separated out during the distillation of the alcohol, these on examination proved to be potassium chloride. The alcoholic residue was exhausted with ether in the cold, which, after evaporation, left a reddish-yellow substance that was sticky, soluble in chloroform, alcohol, and ether, and insoluble in petroleum ether, benzol, and water. It was intensely bitter, and could not be provoked into crystallising from any of its solvents (1). The portion which did not dissolve in the ether was treated with a 5 per cent. aqueous solution of sulphuric acid, in which it was for the most part soluble, filtered, and the filtrate shaken up with chloroform. The chloroformic residue presented the appearance of a dark reddish-brown, bright, hard varnish, intensely bitter. Ether removed the principle to which it owed its bitterness, when it was found to correspond with Aa (1). The chloroformic residue not taken up by ether after re-solution in chloroform and evaporation was brittle, and by trituration yielded a dark brown powder, soluble in alcohol, from which it could be recovered only in an amorphous form (2). The acid solution was next rendered alkaline with ammonia, and agitated with chloroform. The extract left after evaporation of the chloroform, when purified from ether, was free from bitterness, of a pale straw colour, not sensibly alkaline, readily soluble in acidified water, alcohol and ether. So far all attempts to obtain it in a crystalline form have failed. Its solution in acidified water gives copious precipitates with ammonia solution of iodine and potassium iodide, Thresh's reagent, phosphomolybdic acid, platinum perchloride, chloride of gold, iodide of cadmium and potassium, potassium metatungstate, and picric acid. With mercuric and potassium iodide it gives no reaction. It may be purified by precipitating its solution in weak hydrochloric acid with solution of

iodine and potassium iodide, and recovering it from the precipitate by decomposition with sodium thio-sulphate (3).

The portion which, in the first instance, was not dissolved by the 5 per cent. solution of sulphuric acid yielded to chloroform a bitter principle, which had the characters and solubilities of Aa (1). The aqueous alkaline liquor, after neutralisation with sulphuric acid and evaporation to complete dryness, and subsequent treatment with absolute alcohol, left a dark-looking hygroscopic residue, which did not possess characters that would entitle it to be described by a more definite name than extractive (4).

Ab. Residue Insoluble in Alcohol.—This was treated with water to exhaustion and the solution filtered. There was left a small grey pulverulent residue, which consisted of lime phosphate. The aqueous filtrate, after evaporation to a convenient bulk, was precipitated with lead acetate, and the precipitate was collected and washed. Both the lead precipitate after suspension in water and the lead filtrate were decomposed by sulphuretted hydrogen. After removal of the lead sulphide, the separate filtrates were evaporated to a treacly consistence and marked "aqueous extract" and "aqueous precipitate extract" respectively. The aqueous precipitate extract was strongly acid. It was dissolved in water, neutralised with soda, and precipitated with calcium chloride solution, shaken vigorously, allowed to stand, and filtered. The filtrate was boiled, when a further separation took place, and was filtered hot. The filtrate when cold was shaken with three times its volume of alcohol, which caused an immediate precipitate. These several precipitates were recognised as tartrate, citrate, and malate of lime. The filtrate from the last-named precipitate was evaporated to dryness and exhausted with boiling alcohol, which sufficed to remove every trace of calcium chloride. The residue was unaffected by any solvent except water, in which it dissolved completely and readily. When dried over a water-bath it was a reddish-brown, hard mass, which by exposure gradually softened through absorption of moisture. It had a sour, slightly saline taste.

The Aqueous Extract.—This semi-liquid extract was treated with four times its volume of alcohol, the alcohol was recovered by distillation, and the remainder evaporated, when there was left a residue of a bright dark red colour, bitter, and completely soluble in water. After removal of the bitterness by ether it was dissolved in water, precipitated with lead subacetate, and filtered. Both the filtrate and precipitate were decomposed with sulphuretted hydrogen, filtered, and evaporated. The portion precipitable with lead subacetate presented the characters of pectinous substances, and the portion not precipitable with basic acetate was simply extractive.

The residue of the aqueous extract left after treatment with alcohol was dissolved in water and precipitated with lead subacetate. Both the filtrate and the precipitate were decomposed with sulphuretted hydrogen and severally concentrated to a thick consistence by evaporation. The lead filtrate extract, after standing a few days, was studded with crystals. These crystals, when isolated from the extractive in which they were imbedded, were in the form of thin needles, colourless, very soluble in water, insoluble in alcohol, and consisted of a potassium salt of an organic acid. A solution of the salt was not precipitated by barium or calcium chloride or lead acetate. It was converted into a calcium salt, which was decomposed with dilute sulphuric acid. Unfortunately, through an accident at this stage, sufficient crystals were not recovered to admit of their identification.

B. The marc left after expression of the juice was carefully dried and exhausted with rectified spirit. The spirit was distilled off, and the resultant extract

was treated at the temperature of the water-bath with a 5 per cent. solution of sulphuric acid until the soluble portion ceased to react with a solution of iodine in iodide of potassium. After filtration, the filtrate was made alkaline with ammonia, and agitated with three successive quantities of chloroform, which were separated, mixed, and distilled. In its appearance, its indifference to litmus, its solubilities, its refusal to crystallise, and its reaction with alkaloidal reagents, it corresponded with Aa (3).

The portion not dissolved by the solution of sulphuric acid, after washing with water, was dried over a water-bath and exhausted with petroleum ether. That which did not pass into solution was treated with ether. The residue from the petroleum ether was largely soluble in absolute alcohol, and after filtration and evaporation from this solvent there was left a fixed liquid oil, green from the presence of chlorophyll, soluble in ether, bisulphide of carbon and alcohol. The residue from the ether yielded to bisulphide of carbon a considerable quantity of a soft resin, soluble in chloroform. There was finally left an amorphous, blackish, crumbly substance, upon which neither the petroleum ether nor the ether exerted any solvent action. Alcohol removed therefrom traces of chlorophyll, citric acid and malic acid, and chloroform withdrew a hard, bright, brittle, resinous principle, which after washing with ether could be readily reduced to powder. In its characters and solubilities it agreed with Aa (2). The insoluble residue was not further examined.

C. This consisted of the extract obtained by exhaustion of the marc from B with ether, and distilling off the solvent. Petroleum ether dissolved the major portion of this extract. That which did not pass into solution was treated successively with alcohol and chloroform. Of these solvents the former removed a hard, chippy substance, which yielded to ether a bright waxy residue, while the portion insoluble in the ether was brittle, and corresponded with Aa (2); the latter solvent (chloroform) withdrew a substance more akin to a wax than a resin. The petroleum ether residue was a mixture of fatty and waxy constituents. It was saponified by prolonged boiling with a solution of potash in alcohol, allowed to cool, and the matter which separated was collected on a filter and washed with rectified spirit (C1). To the filtrate water was added, and the alcohol evaporated off. It was then shaken up three times with ether, which on evaporation gave a yellow crystalline residue (C2) that readily dissolved in alcohol and gave on cooling a crystalline magma which under the microscope was seen to consist of minute needles arranged in the form of rosettes, and affected by polarized light in a manner similar to fatty acids. This was evidently a decomposition product of the wax. The filtrate, after the withdrawal of C2, was acidified with hydrochloric acid and warmed. The separated and crystalline fatty acid when cold was collected and purified from petroleum ether. The portion not taken up with petroleum ether, after solution in chloroform agreed in its characters with Aa (2).

D. The marc from C was exhausted with cold water, and the liquor evaporated. In this extract, excepting a considerable quantity of a Fehling reducing substance, nothing of importance was found that has not already been referred to as present in the "succus."

The total results obtained may be compressed into a statement of the constituents separated in the course of this examination. They are: *Definite*—potassium chloride, calcium phosphate, citric, tartaric, and malic acids; *Proximate*—bitter principle, hard resin soluble in chloroform, insoluble in ether, soft resin soluble in chloroform and ether, alkaloidal substance, potassium salt of an organic acid, fixed oil;

wax soluble in petroleum ether, wax insoluble in petroleum ether; extractives, one soluble in alcohol and water, two soluble in water only.

Mr. DRUCE said he believed motherwort was first mentioned as a British plant in Gerrard's 'Herbal,' and the place where it was found to grow was near Oxford.

Mr. WILLIAMS said an American author had contributed an examination of motherwort, but his results did not seem very satisfactory. He would ask if Mr. Naylor looked for volatile oil, because such oil was mentioned in the communication to which he referred.

Mr. HOLMES said quite probably the American plant examined belonged to a different species.

Mr. MARTINDALE said he expressed some juice from some plants which Mr. Holmes had sent him, and had sent the extract to Aberdeen for physiological investigation, but he had not yet received any reply.

Mr. GERRARD said Mr. Naylor did not mention whether he had examined these plants for glucosides, but he assumed that he had. The bitter principle might be a glucoside, for it often happened that you got a sort of non-alkaloidal bitter principle, which when freely examined turned out to be a glucoside. Again, he would ask him whether the residue which he had shown represented the whole amount obtained from the 28 lbs. examined, or only a fraction.

Mr. NAYLOR said it was only a fraction.

Mr. GERRARD said sometimes a plant when worked in large quantities would give a small amount of matter and reactions of an alkaloidal character, which would not give a precipitate with Mayer's re-agent. In such cases, where the yield was exceedingly small, it was scarcely worth wasting time on further investigation. It might often turn out that the active principle was to be found in some other body rather than in the small trace of alkaloid present.

Mr. ALCOCK asked if Mr. Naylor had examined for caffeine, seeing that that corresponded with many of the alkaloidal tests, except Mayer's. He could not see any connection between caffeine and motherwort.

The PRESIDENT said he was sure they would all wish to emphasise the vote of thanks to be given to the authors of these papers. Those who knew the amount of executive work done by Mr. Naylor would know that they owed him a large debt of gratitude for having found time to prepare a paper of this sort. He would say, with regard to Mr. Gerrard's suggestion that it was labour wasted when they found such a small quantity of alkaloid, that, as a question of scientific interest, it would be a pity to throw away any article from which they obtained even 5 grains, which might be an active principle, and might throw some new light on some chemical or physiological problem.

Mr. NAYLOR said, after some little experience of what was known as plant analysis, he had learnt to be very cautious in speaking of any principle or constituent one might have isolated as definite. For instance, this bitter principle he had managed to purify by various solvents, but at the present time it gave a reaction with Fehling's solution, and he could not possibly say whether that was due still to some adhering impurity or whether it was due to the body itself. The samples he had produced were taken from a bulk. In some instances he had fair quantities of these separate constituents, and simply brought these samples to represent them. He did not know the amount of alkaloid separated, but he should think it was quite sufficient to encourage one to extract the large supply from $\frac{1}{2}$ cwt. or more of the plant. Of course he had regard to the fact that it might be caffeine

from the negative reaction which Mr. Alcock mentioned, but he was unable to identify it as such.

The following paper was next read—

THE CONDITIONS OF PAPAIN DIGESTION.

BY S. RIDGAL, D.S.C. LOND., F.I.C.

Since communicating some notes on papain digestion to the North British Branch of the Pharmaceutical Society (*Pharm. Journ.*, April 7, 1894), I have had an opportunity of further studying the behaviour of this interesting vegetable ferment, and the fresh results which I have obtained seem to clear up some of the points which my earlier examination showed to be still doubtful. The pure ferment has not yet been isolated, and at present it is impossible to determine the amount of papain in commercial samples. In this respect papain resembles pepsin, and its value as an aid to digestion can only be measured in terms of its relative activity to different brands of pepsin. The term papain, although strictly belonging to the pure ferment, is also used to denote the mixture obtained from the inspissated juice of the papaw fruit, and as an equivalent to papayotin, which seems to be another preparation from the *Carica papaya* tree. The commercial papain used in these experiments appears to contain a uniform amount of active ferment, as the different samples I have examined do not differ very much from one another in digestive activity.

In most of the earlier work with this ferment, comparisons have been made with pepsin under conditions which are known to be conducive to the rapid digestive action of the animal ferment, ignoring altogether the fact that papain from its mode of occurrence and general properties is an enzyme which may have conditions favourable to its action which are altogether different to those which obtain for pepsin. It has long been known, for example, that papain, unlike pepsin, digests in an alkaline fluid, and this fact alone shows that it is more strictly comparable to trypsin than to pepsin. Its analogy to trypsin cannot, however, be pressed too far, since it does not appear to possess a fat splitting power. In some recent experiments on the action of papain on milk and cotton seed oil emulsion, I found that even after four hours at a temperature of 40° C. there was no evidence of the production of any fatty acid, so that, unlike trypsin, papain does not possess the power of hydrolysing fats. I have been unable, also, to find any information as to its action on the carbohydrates, although from its vegetable character one might expect it to possess some diastatic action. It would be interesting to determine whether any of the preparations of papain have any amylolytic action, as such an investigation would aid in determining whether there are several enzymes present in crude papain. Although its hydrolytic action on fats and carbohydrates is thus somewhat remote, there is no doubt of the well-marked proteolytic action which papain possesses. It is the purpose of the present communication to define a little more closely the conditions which are the most favourable for its proteolytic action.

1. Influence of time. Rate of digestion.

In these experiments coagulated white of egg was employed as the material for digestion. The quantity of water present in the finely rubbed sample was determined in the ordinary way by drying at 100° C. until the weight was constant. Weighed portions of the same sample were then transferred to wide-mouthed bottles fitted with corks, and three times the weight of distilled water added, together with one per cent. of papain. The bottles were then placed in a chamber heated to 37° C. and removed after different

intervals of time, when the contents of the bottles were transferred to a muslin filter, washed, dried, and weighed. The following table shows the results obtained in two such complete experiments:—

Percentage of Undigested Albumin.

Time in hours.	Papain 20.	Papain 21.
	8 Gm. albumin. 24 C.c. water. 0.08 Gm. papain.	15 Gm. albumin. 45 C.c. water. 0.15 Gm. papain.
1	25	19.3
1½	23.8	10.6
2	22.8	7.6
2½	22.3	4.2
3	21.6	3.8
3½	20.9	3.2

It will thus be seen that in both cases in less than an hour 75 per cent. of the coagulated albumin had been converted into a soluble form, and that at the end of three hours the digestive action becomes so slow that for practical purposes it may be regarded as completed at the end of that time. It will also be noticed that, although both these samples up to the end of the first hour had approximately the same rate of digestion, the action was pushed to a far greater extent by sample 21 than by sample 20 after this interval of time. The slower rate obtained with papain 20 was due to the fact that the albumin was coagulated in the bottles used, and thus exposed a smaller surface to the digestive action.

2. Influence of temperature.

In these experiments egg albumin coagulated and squeezed through wire gauze was employed, and the bottles containing a mixture of 15 grammes albumin, 45 C.c. water, and 0.15 gramme papain were kept for two and a half hours at the different temperatures given below:—

Temperature.	Papain 26. Percentage undigested.	Papain 27. Percentage undigested.
28° C.	68.6	65.1
32° "	68.0	64.1
38° "	67.2	63.2
40° "	67.1	63.1
42° "	70.0	63.7
45° "	73.5	71.6

In both cases the maximum amount of digestion took place when the temperature was 40° C., whilst at higher temperatures than this the activity of the papain rapidly diminishes. Between 30° and 40° C. the rapidity of the action gradually reaches its maximum. It is interesting to note that the temperature at which the digestive action is most pronounced is approximately the temperature of the blood. This is a remarkable fact, and a coincidence which it is difficult to explain. Diastase, the other vegetable ferment which has been studied carefully, does not begin to lose its power of hydrolysing starch until the temperature of 63° C. is reached. I have not yet had an opportunity of examining bromelin, the vegetable ferment which appears to be most allied to papain, but it will be interesting to see at what temperature its activity is the most pronounced.

3. Influence of the amount of ferment.

Although 1 per cent. of papain has a very marked digestive action, if the amount of ferment relatively to the amount of proteid to be digested be increased, there is a slight increase in the amount of digestion that takes place, as shown by the following results:—

Influence of the Amount of Ferment.
15 grammes Egg Albumin + 45 C.c. Water.

Amount of Ferment in Grammes.	Percentage of Ferment to Protoid.	Percentage Undigested.	
		Papain 32.	Papain 34.
15	1.0	68.6	56.4
25	1.7	63.0	52.9
35	2.3	57.7	49.5
45	3.0	55.7	46.5

There is therefore but little advantage to be gained by increasing the amount of ferment above 1 per cent. on the wet protoid to be digested.

4. Influence of the amount of water present.

In these experiments 15 grammes of egg albumin, prepared as already described, was employed, and 0.15 gramme papain, with varying amounts of water. Digestion was allowed to proceed for three hours at 40° C.:—

Vol. of Water in C.c.	Percentage Undigested.	
	Papain 35.	Papain 36.
25	59.4	44.2
35	64.6	48.7
45	67.1	50.0
55	71.5	55.0

It is, therefore, evident that the amount of water present has a retarding effect upon the proteolytic action, and that the digestion proceeds most rapidly, *ceteris paribus*, in concentrated solution. In this respect papain digestion is very different from that of pepsin, as it seems established that peptic action takes place best when the quantity of water present is far in excess of the quantities employed in the above experiments.

5. Influence of the presence of other substances upon the rate of digestion.

In all the above experiments distilled water was the medium employed in which the digestive action took place. It has been long known that the presence of small quantities of hydrochloric acid and sodium carbonate accelerate the proteolytic action; but, so far as I have been able to ascertain, few experiments have been published upon the quantities which are found to give the most satisfactory results.

(a) To determine the influence of an alkaline medium on the action of the papain, 15 grammes of egg albumin was digested with 0.15 gramme papain in the presence of 45 C.c. of a solution containing known amounts of sodium carbonate and bicarbonate. Sodium hydrate was also tried, but it was found even in 0.25 per cent. solution to gelatinise the albumin and render the fluid difficult to filter. The results with the two carbonates of sodium are shown below.

Strength of Alkali.	Percentage of albumin undigested in presence of:—	
	(I) Sodium Carbonate.	(II) Sodium Bicarbonate.
0.1 per cent.	68.7	58.5
0.25 "	63.3	56.4
0.5 "	58.3	45.7

In these experiments the same papain was used, and the digestion allowed to proceed for three hours at 40° C. They show that sodium bicarbonate is more favourable to the action than the neutral carbonate, and that the digestion is augmented with the increase of the bicarbonate up to .5 per cent. We have not used a stronger solution, but as doubling the amount of bicarbonate has only increased the amount of digestion from 44 to 54 per cent., a further addition of bicarbonate is not indicated.

(b) *Acid Digestion.*—In normal gastric juice there is believed to be about .3 per cent. of free hydrochloric acid, but in artificial digestion Brücke showed that,

ceteris paribus, a solution containing 0.086—0.068 per cent. was the most favourable strength for the digestion of fibrin, and 0.12—0.16 for coagulated egg albumin. Kühne and Chittenden on the other hand state that as high as 0.5 per cent. of hydrochloric acid may be used with advantage. Acetic and tartaric acids act more feebly (Gamble, *Phy. Chem.*, vol. ii., p. 84). I have tried the influence of these three acids and boric acid on digestion by means of papain with the following results:—

Strength of acid by weight.	Percentage Undigested. Papain 21. 15 grammes egg albumin. 0.15 gramme papain + 45 C.c. acid.			
	Acetic acid, B.P.	Tartaric acid.	Boric acid.	Hydrochloric acid, B.P.
0.1 per cent.	65.4	61.3	47.5	70.1
0.25 "	56.0	53.2	47.3	51.5
0.5 "	53.9	50.7	43.7	10.2

It will be seen that with each of these acids (1) the amount digested increased with the amount of acid present; (2) that in the presence of boric acid the quantity of this acid present made the least variation in the amount of digestion; (3) that with 0.5 per cent. hydrochloric acid gives the maximum amount of digestive action. I hope to further extend these experiments with a view to ascertaining whether the differences observed are due simply to the differences in the relative acidities of these liquids.

In a second series of experiments with a different sample of papain the following figures were obtained:—

Strength of Acid.	Tartaric Acid.	Boric Acid.	Hydrochloric Acid.
0.1 per cent.	73.3	74.7	78.2
0.25 " "	71.7	73.3	34.2
0.5 " "	65.4	71.6	11.8

The same papain with distilled water, under the same conditions, left 78.0 per cent. undigested. It is therefore evident that 0.1 per cent. of any of these acids has little influence on the amount of digestion.

(c) *Influence of Salt.*—M. Dastre has lately pointed out that the halogen salts in large quantities (sodium chloride, sodium fluoride, and ammonium chloride) induce a digestive change in fresh proteids in the absence of any ferment. In gastric juice the amount present is about 0.4 per cent. With papain an increase in the amount of salt seems to slightly retard solution, thus:—

Percentage Undigested after Three Hours in Presence of		
0.1 p.c. NaCl sol.	0.25 p.c.	0.5 p.c.
52.2 "	54.3 "	60.8 "

I have also tested the behaviour of formaldehyde, which, under the name of formalin, is being introduced as a preservative, and is therefore likely to be present in food stuffs required to be digested. According to Loew (*J. Prakt. Chem.*, [2], xxxvii., 101) formaldehyde at 40° renders diastase inactive. With papain it has an arresting effect, thus:—

Percentage Undigested in Presence of a Solution of Formaldehyde.		
0.01 p.c.	0.1 p.c.	1.0 p.c.
65.9 "	78.8 "	83.1 "

Papain can therefore be used as a digestive ferment in acid, alkaline and neutral solutions. Its activity is diminished at temperatures above 40° C., and is most pronounced in the presence of small quantities of liquid. No appreciable advantage is gained by using a larger amount than one per cent. by weight of the proteid in its natural state. Its activity is most pronounced in the presence of a hydrochloric acid solution of about 5 per cent. strength, whilst for alkaline digestion a 5 per cent. solution of sodium bicarbonate gives the most satisfactory results. After from three to four hours the rate of digestion becomes very slow, so that for practical purposes this length of time is to be recommended.

In a set of experiments, using 15 grammes of coagulated egg albumin—equivalent to 2.267 grammes of dry albumin, and containing .340 gramme of nitrogen—the amount of nitrogen rendered soluble in three hours by 0.15 gramme pepsin in the presence of (1) 45 C.c. of 0.5 per cent. hydrochloric acid, (2) 45 C.c. of 0.5 per cent. sodium bicarbonate solution, and (3) 45 C.c. of water, were as follows:—

	HCL	NaHCO ₃	Water.
Wt. nitrogen in grammes	0.193	0.121	0.0998
Percentage of soluble nitrogen	57.0	35.6	29.3

It seemed of interest to compare the action of pepsin with that of papain under the conditions which are favourable to the action of papain, viz., in the presence of a small amount of liquid. For this purpose two samples of pepsin were employed, and the amount of digested minced meat fibrin and egg albumin both determined. The following results were obtained:—

1. Meat fibrin quantities.

Weight digested.

Meat fibrin.....	10 grains
Ferment	0.1 grain
Distilled water	30 C.c.
Time	30 minutes
Temperature	38° C.

Pepsin, P.D.	Pepsin, H.S.	Papain, S.I.
A. 12.18 per cent.	11.82	15.34
B. 20.9 „	17.2	41.1

2. Egg albumin. Weight digested.

Conditions the same with constant shaking.

Pepsin, P.P.	Pepsin, H.S.	Papain, S.I.
A. 20.16	20.94	20.42
B. 14.0	14.7	14.5

Under these conditions the papain gave the best results with meat fibrin, whilst with egg albumin the amount of digestion was intermediate between that given by the two pepsins examined.

From an examination of the products of digestion in one experiment in which the total nitrogen digested amounted to 0.105 gramme, I found it distributed as follows:—

Coagulable albumin	0.0253
Albumoses.....	0.0268
Peptone	0.0528
	0.1049

The PRESIDENT said this paper would no doubt prove of great value. Personally he had no experience of the digestive action of papain.

Mr. REYNOLDS said, although he could quite understand the author was not likely to introduce clinical matter into the paper itself, he would recognise that pharmacists felt considerable interest in the application of remedies, and that pharmacy was only a means to an end. Papain had been recommended as a solvent for the diphtheritic membrane, and it would be interesting to know if that was likely to prove correct.

Mr. UMNEY said it was unfortunate that two noted pharmacists who had worked on the subject, Mr. Bengier and Mr. Dott, were not present. There had been many conflicting statements with regard to papain, and if he remembered aright, Mr. Dott said that papain had only a slight solvent action at the temperature of the body, and practically no peptonising power. He should be glad to know if Dr. Rideal confirmed this or disagreed with him.

The PRESIDENT said one point which must strike everyone as very remarkable with regard to these ferments was the small percentage which appeared to be active, and the great activity it possessed. When they had a preparation of pepsin of 1 in 100 it

was thought to be active, but some now they had, 1 in 4000 which was active, it suggested itself to him whether there might not be something similar in the action of these unorganised ferments to what was known as catalysis in chemistry, where a small amount of one body, not altered in itself, practically acted as a carrier and altered the substances which it attacked. There were evidently a number of problems suggested by this paper.

Dr. RIDEAL said he was not a medical man, and therefore could not deal with the question put by Mr. Reynolds. With regard to Mr. Umney's question as to the discrepancy between Mr. Dott's work and this, it depended entirely on the conditions. Most previous investigators as far as he could learn were told that papain was something like pepsin, and followed the pepsin directions. They got results which were contrary to the results shown in this paper, but if they followed the conditions he laid down, they would get good results. The conditions were altogether different from those of pepsin. The chief of those was the quantity of fluid. Keeping the fluid down, you got good results with papain, but if you had present a large quantity of fluid, pepsin was the best and papain the worst.

The Conference here adjourned for luncheon. On resuming, the following note was read:—

NOTE ON COCO-NUT STEARIN AS A BASIS FOR SUPPOSITORIES.

BY C. J. S. THOMPSON.

Some years ago several experiments were made with a view to utilising coco-nut stearin as a basis for suppositories and pessaries, but lack of time prevented their completion. The matter had slipped my memory till recently, when a sample of the base was discovered, prepared at that time and still in excellent condition.

The suggestion is by no means a new one, as Brady, in a paper read before the Pharmaceutical Society in 1866 on "Medicated Pessaries and Suppositories," drew attention to the fact that a satisfactory base for suppositories could be prepared from coco-nut stearin.

For this purpose he recommended the following formula:—

Coco-nut stearin	9 ozs.
Lard	1 oz.
Oil of pimento	20 minims.

The essential oil was added to prevent rancidity, and the lard as a tempering medium. This base, the author states, "will keep unchanged for any reasonable length of time, and leaves little to be desired."

From my own experience with the base it was found much too soft, as it melts at 82° F., and the product when set will scarcely bear handling.

The coco-nut oil of commerce, with which you are all familiar, is the fixed oil of the *Cocos nucifera*, usually obtained by expression.

When pure it should be of a fine white colour, about the consistence of lard at ordinary temperatures, becoming solid at 40° or 50° F., and having a melting point of about 80° F.

It has a bland taste, and its pleasant characteristic odour is well known.

Most authorities now agree that it mainly consists of a peculiar fatty principle called coccin, with small amounts of olein.

Cocin when saponified with alkalies yields glycerin and cocostearic acid, the formula being given as $C_{15}H_{35}O_2$. According to Allen, the main constituent is the glyceride of lauric acid, $C_{12}H_{25}O_2$, and the glycerides of myristic, palmitic, and stearic acids are also present in notable quantities. It is readily soluble in alcohol, and has been also found to contain caproic,

caprylic, capric, and other volatile acids. Its tendency to become rancid is small, and on account of its ready absorption when rubbed on the surface of the body it is largely used in Germany as an ointment base, and in this country in the massage treatment.

It is further claimed to be less liable to produce chemical changes in the substances with which it is associated than lard, and also preserves them better than the animal fat.

The 'United States Dispensatory' states the ointment of iodide of potassium, when made with lard, becomes yellow in a few days, while if made with coco-nut oil remains unchanged for two months or more.

The melting point of coco-nut stearin being low, in order to form a satisfactory base for suppositories, the addition of some more solid body is necessary, and for this purpose after experimenting with several substances I have found white wax answer the purpose best.

The following formula gives a satisfactory result:—

Coco-nut stearin 4 ozs.

White wax 340 grs.

Melt together with gentle heat over a water-bath.

The product is of a firm and fairly hard consistence, with a melting point of about 98° F., becoming solid at 64° F., and will be found admirably adapted for a suppository base. The melting point if considered too high may easily be lowered by using less wax. It mixes well with vegetable extracts, does not go soft on keeping, does not become rancid when in contact with metallic salts, and cools more rapidly than cacao butter.

Cacao butter is now so generally used, and so admirably answers the purpose of a suppository base in almost every respect, that it is a difficult matter to suggest a rival or a body more suitable.

From a pharmaceutical point of view I have found the coco-nut stearin base answer equally well. It has the further advantage of being cheaper, and can be made at a third the cost of cacao butter. It cools very rapidly, and at ordinary temperatures is set and ready to be taken from the mould in about ten minutes.

Suppositories have been prepared with this base from all the B.P. formula, also with belladonna, hamamelin, carbolic acid, boric acid, and many combinations, and in each case it has proved most satisfactory.

Two medical practitioners, who kindly undertook experiments with both suppositories and pessaries prepared with the proposed base, report as follows:—

"The result has in each case been satisfactory and rapid, showing that they have been readily absorbed. As regards the suppositories themselves, they appear to be excellent, and have a very good appearance."

The PRESIDENT said he was very sorry the author was not present. He supposed the justification for this paper was to be found in a paragraph in the last edition of Squire's 'Companion to the Pharmacopœia,' where it was stated that coco-nut stearin was, as a basis, better suited for suppositories in cold weather. As already mentioned, Mr. Brady, in 1865 and 1866, made a number of experiments, and he quoted the formula Mr. Brady said might be used. Since that cacao butter had been used, and was absolutely unobjectionable, and he had yet to learn that the internal temperature of the body varied in summer and winter. He had tried an experiment since the paper was put on the list, and found, after surrounding cacao butter suppositories with ice for twenty-four hours, that the time during which they would melt in water of the temperature of the human body was not materially altered, even by the fraction of a second, from those made in the ordinary way. The possibility was that the oxidation of the

surface of the cacao butter, which went on by keeping suppositories, might retard to a slight extent the time during which they would melt. But cacao was simply an ideal basis for suppositories, and absolutely fulfilled all the conditions. It did not become rancid. It did not change by keeping, and it could be handled at practically any temperature of the English climate, and introduced safely. Stearin suppositories, if made, must be made to suit the temperature, which would vary between winter and summer, and the nurse who had in June to use stearin suppositories made in January would find the mere handling of them would render them too soft to be used properly. To introduce a suppository required a little pressure; you must have sufficient firmness, but when *in situ*, it dissolved at the temperature of the body, which was practically the same, summer or winter. Since the publication of Mr. Brady's papers in 1866, the only change that had been suggested was that in sending suppositories to India, where morphia suppositories were of great value for dysentery, a little wax was added to raise the temperature at which they would soften. Something was said about cheapness. He was certainly in favour of economy—avoiding waste—but cheapness had nothing whatever to do with pharmacy. Who would go into the fractions of decimals that would show the difference between twelve stearin suppositories and twelve made with cacao butter? It was absolutely ridiculous. This reference to economy occurred in three or four papers, but it was absolutely beside the question. Cacao butter answered every requisite. Mr. Brady showed that at that time the German was better than the French, and the French better than the English, but since then English cacao butter could be obtained by the ton at a few pence per pound, absolutely pure. As he had said, the paper might be justified by the paragraph in Squire's book, but he was sorry to see any suggestion that the basis in the B.P. should be altered. That morning there was a question about stearic acid being cheaper than oleic acid, but you could not get any definite body called stearic acid, though you could get cacao butter, which was practically always alike, and did not vary materially in its melting point, and would keep practically for ever.

Mr. GERRARD said up to the present time there had never yet been presented a suppository base that was equal to cacao butter. On one point, perhaps, he might differ from the President, who said that cacao butter did not become rancid. His experience was that it did become rancid, and lost its yellow colour, which was evidence of it. A piece of cacao butter placed in a glass bottle, as was often done in museums, and exposed to light and air, would give evidence of rancidity in the course of two or three months, the colour being changed from yellow to white. It would be very strange if a natural fat did not become rancid. It was true that as compared with other fats it was not so prone to rancidity and was not offensive. About twelve months ago his attention was called to this coco-nut stearin whilst going over the factory of a large confectioner. He told him it was called coco butter, and was sold under that name. It was a beautiful yellow butter, exactly like the ordinary cacao butter, very different from the sample now produced, and had an aromatic odour. His friend said it was used for mixing with certain confectionery, to impart to it a slightly greasy character to prevent it adhering to the mould. He gave him four or five pounds to experiment with, and after testing its qualities he came to the same conclusion as the President, that this coco-nut stearin was not equal to cacao butter as a suppository base.

Mr. MARTINDALE agreed with the President that theobroma was an ideal substance for suppositories. The sample of stearin sent round was very nice

but the disagreeable odour it assumed when it became rancid made it very objectionable. Theobroma if it ever did become slightly rancid was never disagreeable.

Mr. UMNERY said his experience was not quite so great as that of the President or Mr. Gerrard, but he quite agreed with the last speaker that in cacao butter they had a thoroughly sound basis for suppositories. Time was when that substance could not be obtained in a pure condition, but public taste had advanced since then, and now the united makers of cocoa without fat sent on to the London drug market a constantly increasing quantity of genuine cacao butter in a natural condition, and it was also largely supplied bleached. Every two or three months a quantity such as 100 tons would be offered by public auction. As the President had said, a substance could be obtained which varied only within a few degrees of melting-point, and his own impression was that there ought not to be a greater difference allowed. Unfortunately, the Pharmacopœia gave a larger latitude, and he feared that rather encouraged sophistication. He thought one degree on either side of the exact melting-point of pure cacao butter would be quite sufficient.

Mr. MARTINDALE said the great point was to be sure it was dehydrated.

The PRESIDENT said cacao butter could be got in any quantity, and apparently a great deal of it was sophisticated, but in twenty years' experience he never found any difficulty in getting any quantity of it at a moderate price which would melt at a difference of between one and two degrees. Of course it would oxidise, but did not become rancid in the sense that stearin would—in the sense of producing irritating acids which would make it inapplicable in the case of a sensitive rectum. It became rancid probably in a purely chemical sense, but after the suppository had been made for twelve months or two years, it was quite safe to use. If one could find a basis which was superior, by all means substitute it, but if not, there was no reason for dissatisfaction.

(To be continued).

Parliamentary and Labo Proceedings.

POISONING CASES AND INQUESTS.

POISONING BY PRUSSIC ACID.

On Friday, August 10, Mr. John Henry Negus, aged 23, pharmaceutical chemist, of Gold Street, Northampton, was found by his sisters dead in his bed. At the inquest held by Mr. C. C. Becke, the borough coroner, Mr. Lee F. Cogan, surgeon, stated that he was called to see the deceased about a quarter to three o'clock the previous afternoon. He was then lying on a bed, dead, in his bedroom. Witness found a small bottle of liniment for neuralgia, and was shown a bottle containing prussic acid, from which about 20 minims was missing. That was quite enough to cause the death of a man. The symptoms of the body were such as to lead witness to believe death had been caused by prussic acid. Witness had made a post mortem examination of the body, by order of the coroner, the result of which was that he attributed the death of the deceased to the taking of prussic acid. All the organs were healthy except the lungs. Witness had known the deceased for some time, and had attended him; and had known him to be a very nervous man, and given to fits of despondency. The coroner having summed up the evidence, the jury returned a verdict of "Suicide whilst temporarily insane."—*Northampton Daily Chronicle*.

DISPENSING AT HOSPITALS.

On August 3, at Guy's Hospital, Mr. Arthur Langham, deputy coroner for Southwark, held an inquest on the body of Henry William Oviatt, aged 37, a painter, who died in the hospital from the effects of an overdose of chloral. Dr. Alexander Howard, house physician, stated that on being admitted on the 26th ult. the deceased was found to be suffering from Bright's disease. Witness attended him up till Thursday night, when he prescribed a dose of a drachm and a half of chloral, which prescription was written down and handed to the nurse to make up and administer. At twenty minutes to twelve he was summoned to the deceased, and learned that the nurse had mistaken the sign in the prescription and administered an ounce and a half instead of a drachm and a half of chloral, and although emetics were immediately given, the patient's death occurred early in the morning. Nurse Emily Margaret Fox, in charge of the John Ward, who was previously cautioned by the coroner, deposed that the deceased was under her care. The Coroner: Did you carry out these directions, or not? No. The Coroner: What did you give him? I mistook the sign of a drachm for an ounce. Witness added that she discovered her mistake five minutes afterwards, and she at once sent for the house physician and the clinical assistant. After further evidence, the coroner summed up, and the jury at once returned a verdict of accidental death.—*Daily Chronicle*.

SUICIDE BY CARBOLIC ACID.

The Manchester deputy city coroner (Mr. S. Smelt) held an inquest on Monday, August 6, on the body of Samuel Goodlad, aged 34, of Booth Street, Hulme. On Saturday the deceased went home under the influence of drink, and whilst standing in front of the kitchen fire he took a small bottle from his pocket and drank the contents. In reply to his wife he stated that he had taken something for his head. A doctor was called in, but deceased expired on Sunday. A young man named William Sanders stated that he was an assistant to Messrs. Hargreaves and Sanders, chemists, of Booth Street, Hulme. On Saturday deceased called at the shop and asked for twopennyworth of carbolie acid to kill some vermin. He was supplied, the bottle being labelled carbolie acid, "poison." He told deceased to be careful as it was a deadly poison, and he said he would see to it. In answer to the coroner, Sanders stated that he took a rough look at the deceased, and he did not think he was in drink. Mr. Smelt said that a chemist ought to be sure when he sold a poison to anyone. In answer to a jurymen, the coroner said that Sanders had no right to sell a poison, as he was an unqualified assistant. The jury returned a verdict that deceased committed suicide whilst drunk, and at the suggestion of the jury Mr. Smelt said he would communicate with the Pharmaceutical Society.—*South Manchester Chronicle*.

ACCIDENTAL POISONING BY ATROPINE.

At the Oldham Workhouse Infirmary, on Thursday, August 9, an aged woman, named Ellen Ratcliffe, died in one of these wards under sad circumstances, and an inquest was held at the workhouse on Saturday afternoon, before Dr. George Thomson. The deceased had been in a dangerous condition for some time, and on the Wednesday night the night nurse (Nurse Wallis) had in the course of her duty to administer a dose of whisky to the patient. She unfortunately appeared to have mistaken the bottle, and instead of giving her a dose of whisky, as she intended to do, she gave her a dose of poison, called atropine, and the woman died shortly afterwards. After hearing the evidence, the Coroner said it was patent that Nurse Wallis had been

responsible for the unfortunate error. They could only look upon it as one of those strange errors of judgment which people sometimes made, and had the nurse been under ordinary conditions he was not sure that it would not have been necessary to return a verdict of manslaughter against her. Enough had been said to indicate that she was in such a state through excessive night work as to excite sympathy, and under the circumstances he thought that a verdict of misadventure would be the right one. A matter which must have struck the jury was that a deadly poison like atropine should have been placed in a similar bottle to that containing whisky, and in the same cupboard. It was usual in infirmaries to have poisons in bottles thoroughly dissimilar from those containing medicines for internal administration, and it was curious that that had not been done in this case. The jury returned a verdict of "Death from misadventure," with a recommendation that in the future poisons should not be kept in bottles similar to those containing medicines for internal administration, and they also recommended the guardians to increase the nursing staff for night work.—*Manchester Courier*.

POISONING BY LABURNUM SEEDS.

A boy named Alexander Stoddart Affleck, aged 2 years and 11 months, died at Auchendinny, near Penicuik, Midlothian, on Monday, August 20, from eating the seeds of *Cytisus laburnum*. There seems no doubt that he ate the seeds; he afterwards complained of sickness, and was later seized with violent purging and vomiting of green matter. Drs. Badger and Willins, Penicuik, were called in, and an emetic was unsuccessfully tried, and then purgatives, but they were too late, and the child died, having been in severe pain all along, after passing into a state of coma. Several poisoning cases from a similar cause occur in this locality every year, but are generally caught in time, an emetic, followed by castor oil, being found to put the victims all right. Ten cattle belonging to a gentleman in the neighbourhood recently showed severe symptoms of poisoning, which were traced to several laburnum trees growing in the park, and their timely removal put an end to the danger, which nearly produced fatal results.

PROCEEDINGS UNDER THE PHARMACY ACTS.

ACTION AGAINST AN UNREGISTERED PERSON.

At the Gloucester County Court, on Tuesday, before his Honour Judge Ellicott, an action was brought on behalf of the Council of the Pharmaceutical Society of Great Britain, by Mr. Richard Brembridge, the Registrar of the said Society, against William O. Davis, carrying on business at Northgate Street, Gloucester, as the City Drug Stores, to recover the sum of £5, the amount of a penalty incurred by him on May 7, 1894, in selling or keeping open shop for the retailing, dispensing, or compounding of poison, to wit, "arsenic," contained in a compound called "Cooper's Sheep Dipping Powder," or a preparation of arsenic called "Cooper's Sheep Dipping Powder," contrary to the provisions of the Pharmacy Act, 1868 (31 and 32 Vic., cap. 121); also to recover the penalty incurred on May 16 for selling a poison, to wit, "arsenic," contained in a compound called "Cooper's Sheep Dipping Powder," or a "preparation of arsenic" called "Cooper's Sheep Dipping Powder," contrary to the provisions of the said Act: also to recover the penalty of £5 incurred by defendant on May 16, in taking, using, or exhibiting the name or title of "chemists" contrary to the provisions of the said Statute. Mr. E.

R. Vaughan Williams (instructed by Messrs. Flux, Thompson and Flux of London) appeared on behalf of the Society, and Mr. W. Langley Smith, solicitor, Gloucester, defended.

In opening the case for the Society, Mr. Vaughan Williams stated that defendant had been trading as W. Davis and Co., and the action was to recover three penalties under the Pharmacy Acts, under circumstances set forth above. The facts of the case were as follows. On May 7 last Mr. George Pidsley went to the shop of W. Davis and Co., 52, Northgate Street, Gloucester, and purchased a packet of "Cooper's Sheep Dipping Powder," which was sold to him by the defendant himself, and the penalty to be recovered was £5. There was also an action in respect to the defendant keeping open shop for selling, using, and exhibiting such articles, which contained poison. On May 16 Mr. Pidsley again went to defendant's shop and purchased another packet of "Cooper's Sheep Dipping Powder," when he was again served by the defendant, while he also purchased two boxes of Verner's rhubarb pills, which were handed to him in a wrapper. The pills were "Professor Verner's celebrated rhubarb pills," so the wrapper stated, and were sold by "W. Davis and Co., chemists, 52, Northgate Street, Gloucester." The packets containing the sheep dip were kept by Mr. Pidsley, and were subsequently handed over by him to Mr. Moon, clerk to the Registrar of the Society, who afterwards handed them over to Mr. Eastes, analyst to the Society. Mr. Vaughan Williams then proceeded to call attention to the various Acts of Parliament bearing upon the question of persons dealing in poisons contrary to such Acts, and by so doing rendering themselves liable to certain penalties. Section 15 of the Act of 1868 provided that after the 31st December, 1868, any person who should sell or keep open shop for retailing poisons, or who should use the name of a chemist or druggist, for every such offence was liable to a penalty of £5. The defendant's name did not appear on the Register of Chemists and Druggists, and he was therefore liable to a further penalty for styling himself chemist. The sheep dip which the defendant sold to Mr. Pidsley contained a large quantity of arsenic, in fact the amount was sufficient to poison a number of persons. It was one of those drugs which were specially dealt with by the Legislature and a poison which was to be sold only by qualified chemists, and to persons who might be introduced to them by someone who was well-known to the chemist. The Society took up these cases in the interest of the public; there was no personal feeling whatever in the matter against the defendant, but the Society felt bound to take the present proceedings against the defendant.

The first witness called was George Pidsley, who said he resided in Cheltenham. On May 7 last he went to Davis's shop in Northgate Street, which he took to be a chemist's shop. He purchased a packet of "Cooper's Sheep Dipping Powder," for which he paid 1s. He asked defendant for his name after he purchased the powder, and defendant gave him an adhesive label, which witness placed on the packet after he got home. He went to defendant's shop again on May 16, when he purchased another packet of sheep dip, the two packets of which he now produced. He was served by defendant on that occasion, as he was on the previous occasion. On the same day he purchased two boxes of rhubarb pills, which were wrapped in a printed circular, on which were the words:—"Sold by W. Davis and Co., chemists, etc." Witness kept the packets of sheep dip and also the handbill till he handed them over to Mr. Moon, the clerk to the Registrar of the Society. The name over the shop was that of "W. Davis and Co., the City Drug Stores."

Cross-examined by Mr. Langley Smith, witness said he was an agent to the Society and resided at Cheltenham. He was requested to go to the defendant's shop by the Society. He did not know whether any previous information had been given. He was told to go to the defendant's shop to get a sample of the poison. His experience in such business was not very great. He did not know whether there was any difficulty in getting these packets of sheep dip at any other shop in the city.

Mr. Vaughan Williams objected to the question, as he said it was not evidence.

Cross-examination continued: Witness said he could not say the powder was composed of arsenic, as he was only asked to get a packet of the dip. He did not know it was composed of arsenic nor that under section 17 of the Act of 1868 the packet ought to have a label stating that it was a preparation of poison.

Mr. Langley Smith: Do you not think the Society ought to prosecute the makers of the sheep dip, and not the retailers?—I do not know. I do not know what the powder is used for, as I was only asked to purchase it. I will swear that the defendant gave me the label. I placed the labels on the packets because I should be less liable to lose them. I have only been on one prosecution before. I have resided in Cheltenham for about twelve months, previous to which I resided at Weston-super-Mare. I made a note of my visit to defendant's shop after I got home, and sent it up to the Society.

By Mr. Vaughan Williams: I am an agent employed by the Society to make inquiries.

The label on the sheep dip packets was then read, which was to the effect that it was a preparation of poison.

Mr. Harry Moon, clerk to the Registrar of the Pharmaceutical Society, said he received the two packets produced, with a report from the last witness, and handed them to Mr. Eastes, the analyst. They were handed to witness on July 20. When he received the packets they had not been opened. He handed them to Mr. Eastes on August 27. He thought it was possible to see the word "poison" on the packets.

In answer to Mr. Vaughan Williams, witness said that from the time he received the packets to the time he handed them to Mr. Eastes they were closed. It was impossible for the contents to have been taken out, as they were locked up.

Mr. Ernest John Eastes said he was an analyst, a Fellow of the Institute of Chemistry demonstrator to the Pharmaceutical Society, and assistant to Professor Attfield. He had had considerable experience as an analyst for a great many years. He received the packets of sheep dip produced, at which time they were enclosed. He analysed them, and found the dip to consist of arsenic, sulphide of arsenic, and sulphur. The total weight in each packet was nearly 2lbs., about one-third sulphur, but the greater portion was sulphide of arsenic, with a quantity of free arsenic. Arsenic was a very dangerous poison, and should only be sold by persons duly qualified, to persons who were well-known to them, whose signatures should be entered in a book kept by the chemist for that purpose. There were nearly 2000 grains of arsenic in each packet, and one packet would be sufficient to poison hundreds of persons.

By Mr. Langley Smith: There was a register of chemists kept. He did not know that the dip was sold by grocers. He had never purchased any. If there was only a very small quantity of arsenic it would come within the provisions of the Act. There was nothing on the outside of the packets to indicate that they contained arsenic, but only the word poison.

In answer to Mr. Vaughan Williams witness said the law requested that poison registers should be kept by chemists. He had known of cases where penalties had been enforced where the contents included only 1-10th of a grain of poison. There was a very large quantity of poison in the packets produced, in addition to sulphide of arsenic.

Mr. Vaughan Williams here put in the register of the Society to prove that the defendant's name was not entered in it.

Mr. Langley Smith said he was quite willing to admit that the defendant's name was not on the register. He went on to say that he considered it a very cruel action on the part of the Society, as they were not content to proceed with one case only, but proceeded with three. According to the Act of Parliament it was really a persecution of the poor man. He was only keeping what many hundreds of persons in England kept, a drug store, and amongst other articles sold was sheep-dipping powder. He could prove that the packets could be purchased at any grocer's shop in the city, and he produced a packet which his clerk had purchased that very morning. The defendant did not know that he was doing wrong, and he did not know that he was committing any offence when he sold the powder. He (Mr. Langley Smith) thought the Society ought to go to the fountain-head and prosecute Cooper. But they did nothing of the kind. The upshot of it was that his client obtained the powder from chemists in the city, and when it was asked for he simply handed it over the counter. It was an innocent act on the part of his client. He submitted he was not retailing a poison, and that arsenic was not one of the poisons mentioned under the Act.

The Judge: Can you refer me to any case where a guilty knowledge must be proved under the Act?

Mr. Langley Smith: Perhaps not, your Honour.

The Judge: Then you want to bring in a guilty knowledge?

Mr. Langley Smith: Yes.

The Judge: But it is not in the Act.

Mr. Langley Smith asked his Honour whether it would not constitute one offence only, and that the sum recoverable was £5? It was surely one and the same offence, as it was dealing with the same powder.

The Judge ruled that there were three different offences, and that the Society was entitled to the amounts sued for, and he gave judgment accordingly.

As to the question of costs, Mr. Vaughan Williams applied for an order for £1 a month.

Mr. Langley Smith asked his Honour not to allow costs. He called the defendant, who stated that he only got a profit of a penny upon a packet of sheep dip. He kept a lodger who paid him 12s. a week. He had a wife and two young children, one of whom was only six months old. He could not offer more than 10s. a month for the costs.

By Mr. Vaughan Williams: His takings were £4 a week, and his profits were about a third on an average.

His Honour then entered judgment for £15, and made an order for the costs to be paid at the rate of 10s. a month.

Obituary.

Notice has been received of the death of the following:—

On August 4, Joseph Parkes, Pharmaceutical Chemist, Atherstone. (Aged 79.)

On August 7, William Samuel Weeding, Chemist and Druggist, late of Walworth. (Aged 40.)

Correspondence.

THE DOSE OF ACETANILIDE.

Sir,—There is an interest for dispensers as well as for prescribers in the report of the Therapeutic Committee of the British Medical Association just presented to the Annual Meeting at Bristol.* The point of immediate importance consists in the authoritative expression of opinion by the Therapeutic Committee (of which Professor Leech, of Owens College, is Chairman) that the proper dose of acetanilide (antifebrin) is from one to four grains. The majority of observers, who are stated to have used from four to ten grains, may shield themselves under the official dose given by the B.P. Appendix, 1890, viz., "three to ten grains," a fact which is rather singularly ignored by the Therapeutic Committee. For the future, there can be little doubt that prescribers will accept the new dosage of this drug, and it is desirable that dispensers also should be made aware of the circumstances that will have decided the change.

Leeds.

R. REYNOLDS.

THE REVISION OF THE BRITISH PHARMACOPEIA.

Sir,—In revising the present B.P. I think a slight alteration might be made in the recipe for tinct. benzoin. co. Instead of rectified spirit one pint, it would be better to read it rectified spirit a sufficiency. In the directions for making it, it says macerate for seven days, filter, and then add rectified spirit, if required, to make one pint. In making six pints of tinct. benzoin. co. I find after it is finished it measures exactly 15 ozs. over the original six pints, which is equivalent to 2½ ozs. per pint. Of course this might not work out exactly the same in making one pint, as the loss in filtering would be more in proportion. Another alteration I believe would be beneficial in making syrupus, B.P. Whilst recognising the fact of keeping the syrup up to a certain density to prevent fermentation, a small quantity of glucose substituted for part of the sugar would prevent the syrup crystallising, and at the same time keep up the density.

Cambridge.

H. T. PARKER.

Sir,—In the Journal of June 2, p. 1016, I notice that processes for making tinctures, etc., are to be given in the coming new edition of the B.P. I would advocate the packing of the material in the percolator in the dry state, with or without pressure, according to the nature of the drug, then pouring on enough menstruum to moisten, and allowing to stand forty-eight hours. Now add more spirit, in small quantities at a time, giving a day or two for the process. I add the spirit until about 5 per cent. more than ordered is employed, and when the fluid has quite ceased to drop, press out and make up by adding more spirit if necessary. The directions to filter I would omit, as when convenient the tincture can stand aside for a few days, then about 90 per cent. of it, if poured off carefully, will rapidly run through the paper, and so shorten the exposure during filtration. Perhaps an illustration of the precise method followed recently in preparing a batch of tr. hyoscy. may be useful:—25 ozs. fol. hyoscy. bien. yielded 22½ ozs. No. 20 powder and ¼ oz. coarser; the latter, after several times powdering and sifting, refused to pass the sieve. The neck of the percolator being tied over with muslin, the coarse powder was first placed in, then the No. 20, gradually pressing well after each addition. Required two pints to moisten. After forty-eight hours added a pint or so of proof spirit night and morning until 192 ozs. had been used. When percolation was complete, the marc was well pressed, and we obtained exactly the 18½ ozs. Loss in making 184 ozs. was thus 8 ozs. spirit. Of course a stock of proof spirit should be kept, and not have to be made as required for use. If any one works a better process with less loss, I should be glad to know it. Tinct. rhei and tinct. calumbæ should be packed lightly. In making tr. card. co. no allowance for loss is necessary. We recently made 12 pints of this—using 12 pints of proof spirit, we obtained 12 pints and 2 ounces of product. In the case of the less used tinctures, of which 1 or 2 pints is the quantity prepared, the loss increases to

about 10 per cent. The usual rate of percolation I allow is 15 to 20 drops per minute, and if much more occurs, further pressure with a blunt instrument is applied before the next addition of spirit. I never experience a "block," but if such occurs, it is necessary to empty out and repack without pressure. There is but slight loss in tr. opii.—3 ounces in making a gallon. At another time 2½ ounces loss was experienced in making the same quantity.

Tr. Scilla.—The squill should be dried and coarsely powdered.

Tinct. Quin. Am.—It is well known that no heat is required. The following process is simple—

Take of—

Sulphate of quinine	160 grains.
Solution of ammonia	2½ fluid ounces.
Rectified spirit	11 " "
Distilled water	q.s.

Mix the liquid ammonia and the rect. sp., add the quin. sulph., stir and add dist. water to make a pint.

Syrup of Rhubarb.—The present process for this syrup is wasteful. If the spirit is recovered by distillation, most of the aroma of the rhubarb and coriander passes over, and of course is absent from the syrup. I would suggest the following formula:—

Take of—

Rhubarb root	8 ozs.
Coriander fruit	8 ozs.
Rectified spirit	5 ozs.
Distilled water	q.s.
Refined sugar	6 lbs.

Powder the rhubarb and coriander, using No. 20 sieve. Place the portion which, after several times powdering, refuses to pass the sieve, at the bottom of the percolator, then add that which passes the sieve, using but little pressure. Mix the 5 ounces of spirit with 16 of distilled water, and pour on the powders. Macerate thus for twenty-four hours, then continue to add distilled water until 52 ounces have passed. In this dissolve the sugar with a gentle heat. Percolation may be continued until about 3 pints more have passed, this evaporated by water bath to 4 ounces, and strained into the syrup. I enclose a sample prepared thus, also one made strictly P.B. (except that I recovered 6 ounces of spiritus rhei c. coriand. of S.G. '897 by distillation). Should like your opinion as to aroma, etc. The P.B. is the brighter, because the liquor was filtered through paper.

Northampton.

J. CLOWER.

* * The aroma of the sample of syrup of rhubarb prepared by the suggested process is decidedly finer than that of the accompanying P.B. specimen. Besides being less clear, however, it also appears more liable to fermentation than the latter, the cork having been forcibly ejected from the bottle containing it, and the fermentative action continuing for some days, whereas in the P.B. syrup no such action was apparent under identical conditions.—[Ed. Pharm. Journ.].

EMPLASTRUM LYTTE, P.B.

Sir,—Replying to Mr. Mason's letter anent "Emp. Lyttæ," it is essential to cleanse the parts, previous to applying the blister, with soap and water, in order to remove the natural fat secreted by the skin. If Mr. Mason's customers were not in any way directed to do this, it may easily account for the variability complained of.

Staleybridge.

H. G. W.

Answers to Correspondents, etc.

Don. Mitchell.—1. *Myrica gale*. 2. *Lycopodium clavatum*. 3. *Arctostaphylos uva ursi*.

"Secundus."—1. *Sparganium simplex*. 2. *Erythra centaurium*. 3. *Alisma plantago*. 4. *Fernoxia beccabunga*. 5. *Myosotis beccabunga*. 6. *Alisma plantago*. Get Babington's 'Manual of British Botany.'

COMMUNICATIONS, LETTERS, etc., received from Messrs. Burt, Duncan, Henry, Hill, Inch, Martin, Yewdall.

Aids to Aseptic Surgery.*

BY EDMUND WHITE, B.SC. LOND., F.I.C.,
Pharmacist to St. Thomas's Hospital.

STERILISED SURGICAL DRESSINGS.

The supply of sterilised dressings to a large institution presents a number of difficulties which are not encountered in private surgical practice. I propose to give an account of the apparatus and method of procedure which have been adopted in St. Thomas's Hospital.

The steriliser, Fig. 1, is a cast-iron circular vessel, having an internal diameter of two feet four inches, and a depth of two feet. The walls are $\frac{1}{2}$ -inch thick, and are covered to a thickness of two inches with asbestos to prevent loss of heat as much as possible. The lid is flat, $\frac{1}{2}$ -inch thick, and strengthened by four radial ribs. It is secured in place by six swivel bolts, four of which are shown in the figure, and raised by a wheel and screw, H, passing through an arm or davit. This davit turns

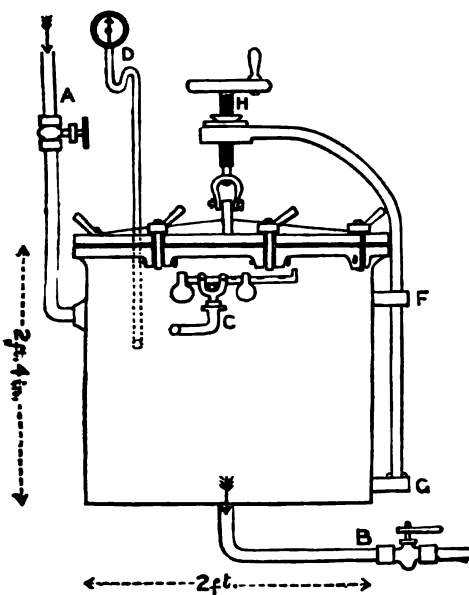


FIG. 1.

Apparatus for rendering surgical dressings aseptic.

in the two sockets, F, G, thus allowing the lid to be swung aside when raised. Inside there are two removable shelves of perforated galvanised iron, supported by projections cast on the interior of the steriliser. The steam supplied from the boiler of the pharmaceutical laboratory enters at the side through the pipe A, waste steam and condensed water escape through the pipe B. A safety-valve, C, and pressure gauge, D, complete the apparatus.

The dressings are cut, folded, or made into the form in which they will be used, and placed into cylindrical glass jars provided with flat overlapping lids. The size mostly used is eight inches in height and four inches in diameter.

The jars are filled by the "sister" who has charge of the case for which the dressings are intended. They are placed in the steriliser lying on their sides with the lids off, and exposed to the action of steam for one hour. The steam pressure is allowed to rise gradually during the first fifteen minutes until the gauge shows 18-20 lbs. to the square inch, a pressure corresponding to a temperature of about 125° C. At the expiration of the hour the supply of steam is shut off and the compressed steam allowed to escape by opening the tap in the pipe B. The lid is released by unscrewing the swivel bolts, and raised about half an inch to allow the remaining steam to diffuse out. It is next swung aside and the jars removed by an attendant, who spreads over the mouth of each a layer of sterilised cotton wool before putting on the lids. The layers of wool being compressed between the edge of the jar and the lid prevents the ingress of dust or germs. Over each jar a long, narrow label, gummed at the ends, is placed, on which is marked the ward from which

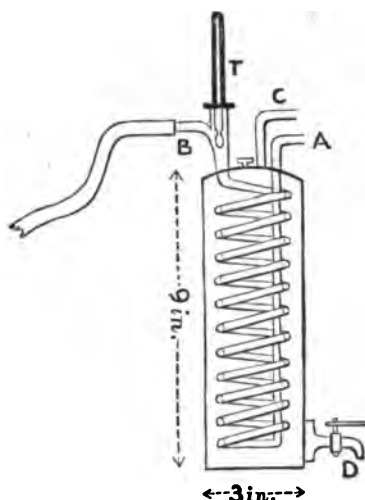


FIG. 2.

Temperature regulator for use in sterilising water.

the jar is sent and the date of sterilisation. The jar cannot be opened without breaking this label, which thus indicates whether the contents have been tampered with after sterilisation.

It was found at first that the materials came out too damp, sometimes even quite wet, thus diminishing their absorbent power. This defect is now remedied by first heating the empty steriliser by the passage of steam for about fifteen minutes. It is then opened, and after allowing the enclosed steam to escape the jars are put into position. The steriliser being of massive construction retains the heat imparted to it by the preliminary steaming, and after waiting fifteen minutes for the jars and their contents to become heated the steam is again turned on, and sterilisation completed in the manner already described. After this preliminary heating in the hot dry steriliser there is much less condensation of moisture in the dressings. For the first five minutes of sterilisation steam is allowed to pass freely through the apparatus, so as to displace the air

* By the courtesy of the editors of the forthcoming volume of the St. Thomas's Hospital Reports, we are enabled to reprint this article from advance sheets.—[Ed. P. J.]

and secure a thoroughly moist atmosphere, and for the rest of the time the tap in the pipe *s* is kept slightly open, just enough to allow the condensed water to escape with a little steam.

STERILISED WATER.

The apparatus for the supply of sterilised water for irrigation, etc., in surgical operations consists of two parts, the first, Fig 2, in which water supplied from the main is brought to the required temperature; the second, Fig 3, in which the water is sterilised by passage through a Berkefeld (kieselguhr) filter.

Fig. 2 consists of an outer copper cylinder, nine inches long and three inches in diameter, in which is placed a coil of copper tubing thickly tinned inside. Through this coil water passes from the hot water main, and its temperature is recorded by the thermometer *t*. As this is nearly always hotter than required, the space around the coil is filled with cold water entering through the tube *c*. By means of the tap *d* at the bottom the outflow

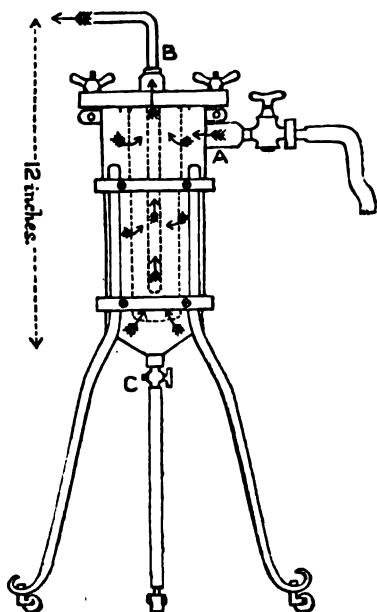


FIG. 3.

Kieselguhr filter arranged for sterilising water.

of this cold water may be so regulated as to bring the water leaving the coil to the desired temperature. The water then passes to the filter through rubber tubing sufficiently long to allow the filter to be moved easily to any part of the operating room.

The filter, Fig. 3, which is twelve inches long by about three inches in diameter (outside measurement), consists of a cylinder of compressed kieselguhr enclosed in an iron jacket. In the figure the position of the filtering cylinder is indicated by the dotted lines. The water entering at *A* fills the space between the jacket and the cylinder; it is driven through the latter, and escapes sterilised by the tube *B*. The filter is mounted on an iron tripod, provided with rubber-tired wheels to enable it to be easily moved about

the operating table. With twelve feet of tubing between the coil and filter it is found that the temperature of the water passing from the thermometer *t*, Fig. 2, to the orifice of *B*, Fig. 3, falls from 2° to 5° F., according to the rate of flow. That is, if water at 100° F. be required, the thermometer should indicate 102°–105° F.

When hot water is not available the coil may be used thus:—Cold water is passed through the coil, the space outside being also filled with cold water. A gas burner placed beneath the cylinder heats the water around the coil, the water passing through being brought to the desired temperature either by regulating the gas burner or by opening the tap *d*.

In places where the pressure in the hot and cold water pipes is the same, the waters may be mixed, before entering the coil, in the proportion to give the desired temperature. Regulation of temperature by the flow of cold water through *c* to *d*, Fig. 2, is then unnecessary. It is advisable even in this case to have the coil arranged as shown, for in case of failure of the hot water supply, gas may be used as the source of heat.

The sterilising power of the filter has been tested at the end of one hour's, twenty-four hours', and forty-eight hours' continuous passage of water. In no case could any growth be obtained by inoculating culture tubes, either at ordinary temperature or at 40° C.

It is advisable to remove the kieselguhr block, boil it in water about every other day, and lightly brush it in order to remove the deposit which collects on the outside and retards the flow of water through the filter.

THE CULTIVATION OF LIQUORICE.

The liquorice plant (*Glycyrrhiza glabra*, L.) is a native of North Africa, Southern Europe, Syria, Persia, and Afghanistan, and is cultivated in France, Russia, Germany, Spain, and China, and also to a slight extent in England, where its growth is said to date from the middle of the sixteenth century. Some twenty or thirty years ago liquorice was cultivated in market gardens in the neighbourhood of London, especially about Kew and Isleworth, and more recently at Mitcham. At the present time Yorkshire produces the larger quantity of English-grown root, and the principal seat of its culture is in and around Pontefract. Its cultivation in this particular neighbourhood dates back several generations, the deep, rich, loamy soil which occurs here being specially suited to the growth of the plant. The bulk of the liquorice gardens are situated on the fertile slopes east and north-east of the town, the country between Pontefract and Knottingley being largely occupied by market gardens, in which liquorice forms an extensive crop. The following notes on the cultivation of the plant and harvesting the root are taken from an article on the "Culture and Preparation of Liquorice," which appeared in the *Leisure Hour*:—

"The plants are grown in rows, and they stand from three to four years before arriving at perfection. The three years' growth is thinner and scarcely so rich in juice as the four years' plants. Occasionally, if the market is flat, the plants are allowed to grow a fifth season, but the root becomes thicker, coarser, and

more woody. The long straight root goes down to a great depth, averaging perhaps about 4 feet, but sometimes even to 6 feet; and as the soil has to be dug down to this depth by hand to extract the root, the labour of cropping or harvesting is considerable. During the first two years that the land is occupied by liquorice, the plants themselves, being small, allow of other crops being planted between the rows, and potatoes, and different varieties of cabbage, are mostly grown. The ground being earthed up around the liquorice plants, the furrows thus made afford much protection to the vegetable crops, and as the ground is always richly manured before planting liquorice, favourable conditions are thus ensured for the production of early and very superior vegetables; indeed it is said that the vegetable crops from a liquorice plantation always command high prices in the Leeds markets. After the second year, however, the liquorice plants grow to such a height, and spread their foliage so widely, that other crops will not grow beneath them. On a visit to Pontefract, namely, in the early part of September, the writer saw some of these liquorice gardens where the plants had attained the age of five years and a height of about 4 feet, each plant sending up numerous straight stout stems from the root-stock or crown, each stem bearing large spreading alternate leaves, composed of a number of opposite leaflets of a bright green colour."

"The harvesting season is about the middle of September, and after the roots have been taken out of the ground by hand digging, as before mentioned, they are stored in cool ventilated houses or cellars, usually in sand, until a favourable opportunity occurs for the process of dressing, which consists of trimming off all the fibrous rootlets, buds, and runners or stolons. The fibrous roots are ground into liquorice powder, which is used as a medicine, and the buds and runners are carefully preserved in sand for planting, for it is from these alone that new plants are raised, and never from seed. The plants never being allowed to flower, do not of course produce seed. Flowering would deteriorate the value of the plant from a commercial point of view, as the juices would be consumed in perfecting the flowers, and the roots thus become useless. The planting of buds and runners for a new crop is done in the early part of April."

In Bentley and Trimen's 'Medicinal Plants,' vol. II., under plate 74, it is stated that "both Spanish and Russian liquorice roots are usually imported in bales or bundles, or rarely, in the case of that portion of the Spanish variety which is derived from Alicante, loose, or in bags. The Spanish liquorice root is in straight unpeeled pieces, several feet in length, and varying in thickness from a quarter of an inch to about 1 inch. That from Alicante is frequently untrimmed and dirty in appearance, but that from Tortosa is usually clean and brighter looking. The Russian liquorice root, which is imported from Hamburg, is either peeled or unpeeled. It is in pieces, varying from 12 to 18 inches in length, and from a quarter of an inch to an inch or more in diameter. Combined with the usual sweetness of liquorice root, this variety has a feebly bitter taste.—*Kew Bulletin*.

THE ANALYSIS OF MALT.*

BY JOHN A. MILLER, PH.D.

Having been called upon during the past few years to assay a great many samples of malt, I have been struck by the variation which existed between the results of my own analyses and those made by other chemists upon the same samples. The variations in some cases were too large to be placed within the possibility of experimental error. With the belief that these variations might, in part at least, be due to a greater or lesser degree of accuracy in the methods employed in the analysis of malt, I undertook a comparative investigation of three methods which are quite universally used.

From the stand-point of the largest consumers of malt, the important points to be ascertained by the analysis of a malt sample are 1, moisture; 2, percentage of extract which the malt will yield when submitted to a miniature mashing process; 3, diastatic power, that is the rapidity with which the starch contained in the malt is converted into sugar and dextrin; 4, the percentage of acidity (calculated as lactic acid) which the wort contains.

It has been claimed by some that the percentage of sugar formed and the amount of proteids dissolved is of importance in judging of the character of the malt. The amount of sugar is of no practical value to the brewer, as the increase or decrease of the percentage of that article is entirely dependent upon the manner in which the malt is handled in the mash tub. The total nitrogen in the malt wort calculated as proteids is of little value, since the percentage present in the finished beer will depend upon so many factors as to render the first results of comparatively little value. Amongst the factors which will influence this percentage are: Character of the water used in mashing; the use of a high or low initial mashing temperature; the length of time the wort is boiled in the kettle; the amount and character of the hops used; the character and quantity of yeast used; and the character of the fermentation.

The four points mentioned are of about equal importance in the assay of a malt sample. The determination of moisture shows whether the malt has been properly dried, and also whether the purchaser is not paying too high a price for an article which he can obtain very readily from the city water supply. The determination of lactic acid is of value from the fact that it enables one to judge, within reasonable limits, of the age of the malt under examination. For example, a sample of malt which is low in moisture and high in lactic acid is an old malt which has been re-dried to bring down the high percentage of absorbed moisture. In a first-class sample of malt the moisture should not run above 5 per cent., and the lactic acid 0.7 per cent.

Determination of Moisture.—Two methods were investigated in order to ascertain their relative accuracy. In the one method from 2 to 4 grammes of ground malt was used; in the other 20 grammes. In both cases the samples were heated to 100° C. until

* From the *Journal of the American Chemical Society*.

the weight was constant. Both methods gave results agreeing to within the third decimal place. The use of from 2 to 4 grammes, however, is to be recommended :

1. Because it admits of the use of ground watch crystals for drying and weighing, thus preventing the absorption of moisture while the sample is cooling.

2. The time required to obtain a constant weight is much less than when 20 grammes are used.

Determination of Extract.—The determination of the percentage of extract which a malt will yield is of very great importance, as upon this percentage the value of the malt largely depends. It is evident that a sample of malt yielding 55 per cent. of extract has not the same commercial value as a malt yielding 60 per cent.

METHOD NO. I.

"Fifty grammes of ground malt is weighed out as rapidly as possible (to avoid accession of water) and treated in a weighed beaker with 250 C.c. of warm distilled water, of such a temperature that the initial heat of the mixture may be from 50°–52° C. The beaker containing the mash is placed in a water-bath, and the contents maintained at the same temperature for a quarter of an hour. The heat is then gradually raised till the immersed thermometer registers 59°–60° C., and the temperature is then kept constant till a drop taken from the liquid ceases to give a blue colour with iodine solution and nearly ceased to give a brown. This shows that all the starch and nearly all the erythro-dextrin has suffered hydrolysis—a point which will be reached in about twenty minutes. The heat is then increased to about 70° C. in order to complete the saccharification, when the water in the bath is boiled for five minutes. This step, which completes the process of mashing, should be arrived at in about 100 minutes from the commencement of the operation. The beaker is then cooled and the contents filtered. The insoluble matter is washed with cold water, and the filtrate is made up exactly to 400 C.c. The density of the clear wort is next taken at 15°–5 C. in the usual way by a specific gravity bottle. The excess of density over that of water (taken as 1000) multiplied by 2.078 will give the percentage of dry extract yield by the malt. Instead of ascertaining the gravity of the infusion, the proportion of solid matter may be determined by evaporating a known measure of the wort to dryness in a flat-bottomed dish, so that the residue may form a thin film. The extract dried at 105° C. till constant in weight."

Two portions of 50 grammes each of same sample of malt treated as indicated above gave the following results :—

	I.	II.
Specific gravity of the wort	1.0284	1.0284
Extract calculated by factor	59.01 p.c.	59.01 p.c.

5.142 grammes of the wort was then taken and placed in a wide flat-bottomed platinum dish and the extract dried at 105° C. to almost constant weight. The following was obtained :—

	I.	II.
Weight of the extract...	0.3496 gramme	0.3488 gramme
Average weight	0.3492 gramme	
Percentage of extract.....	55.87	

5.142 grammes was again taken and placed in a flat-bottomed dish, and this in a water oven, the temperature of which was kept at 70°–75° C., and the extract dried to constant weight. The time required for this was about seventy hours.

	I.	II.
Weight of the extract...	0.3694 gramme	0.3681 gramme
Average weight	0.3687 gramme	
Percentage of extract	58.992	

METHOD NO. II.

"Fifty grammes of ground malt is carefully weighed as rapidly as possible. The ground malt is put into a copper beaker, the weight of which is known, and this beaker is placed in a water-bath. Water is now mixed with the malt to the amount of 200 C.c., at a temperature of 38° R. This temperature is held while the malt is continuously stirred for thirty minutes, when the temperature is raised to 58° R., 4° R. each five minutes. When the temperature of 58° R. is reached, tests are made in order to find out whether the starch has been converted completely. Usually we find that after the temperature of 58° R. has been reached all the starch is converted. The mash is always held thirty minutes after the temperature of 58° R. has been reached, when it is boiled for five minutes, cooled off, and water enough is added to make the weight of the contents of the beaker, or the weight of the entire mash, 350 grammes. The wort is then filtered off. After the wort has been filtered the specific gravity is taken from which the per cent. Balling is ascertained, and the amount of extract in the malt computed to the following formula; viz. :—

$$(600 + \text{per cent. water}) \times \text{per cent. Balling.}$$

$$100 - \text{per cent. Balling.}$$

Two mashes of 50 grammes of malt gave the following :—

	I.	II.
Specific gravity of the wort	1.0385	1.0383
Average specific gravity..	1.0384	
Extract calculated by formula	63.85 per cent.	
Moisture in the malt.....	7.53 "	"

5.192 grammes of wort was then placed in a flat-bottomed dish and dried at 105° C. to almost constant weight. Results, viz. :—

	I.	II.
Weight of extract	0.4520 gramme	0.4522 gramme
Average weight	0.4521 gramme	
Extract	54.25 per cent.	

The same amount of wort dried at 70°–75° C. for about seventy hours gave :—

	I.	II.
Weight of extract.....	0.4924	0.4922
Average weight	0.4923 gramme	
Extract	59.07 per cent.	

(To be continued.)

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, SEPTEMBER 8, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brembridge,—17, Bloomsbury Square, London, W.C.

THE VIIIth INTERNATIONAL CONGRESS OF HYGIENE.

THE very numerous attendance at the gathering now being held at Budapest is not only an emphatic confirmation of the opinion entertained by Hungarians that their beautifully situated though remote capital is well adapted to be made the seat of a congress of hygiene. In addition to the demonstration of that fact, which will afford general satisfaction, the large number of visitors from all parts of the world is also evidence that, unlike some other gatherings of a similar nature, the Congress of Hygiene and Demography cannot be characterised as a concentration of cranks. Among the subjects dealt with by the method of international congress, the care of public health and the study of the influences exercised by various local conditions of social life are of such prominent and inevitable interest from an international point of view that they offer a sound basis for the periodical repetition of each meeting. In this respect the present Congress at Budapest is to be looked upon as a significant expression of the importance attached to hygienic subjects, and the assembling in that city of more than two thousand visitors is an indication of the fact that it is rapidly advancing to the position of the metropolis of Eastern Europe.

To pharmacists this Congress presents an interesting aspect, inasmuch as it is the first occasion on which an independent section devoted to the consideration of pharmacy has been made a part of the official programme. It has not been by any strained interpretation of the functions of pharmacists, and of the objects of the art which they practise, that this result has been arrived at. It is rather a consequence of due appreciation of the demands which the present time makes upon pharmacy, and of the perception that preparation for

satisfying those demands must be made by its followers. The inauguration of an era in which medicine is regarded not only as a means of curing disease, but also as having the still more desirable object of its prevention, has created for pharmacy and for those who are engaged in the practice of the art a vast new field for the useful exercise of their capacities as professional administrators of the increasing powers acquired by scientific investigation. From this point of view the Congress at Budapest marks an epoch in the history of pharmacy.

As the business of sections only commenced on Monday, we are unable to do more than record the fact, and defer further report of the proceedings to a future occasion. But it may be stated that in every respect there is promise of a very successful result. The official reception of visitors on Saturday by the municipal authorities of Budapest was of a most cordial and hospitable character, and on all sides proofs were given of the graceful and friendly politeness which is equally characteristic of Hungarians and Austrians. The frequent familiarity with other languages besides their own has also been a great advantage to many of the guests, and has tended largely to promote the formation of acquaintances, and to facilitate intercourse. The ceremony of opening the Congress, at which the Archduke CARL LUDWIG presided, was a particularly brilliant spectacle, though it was a source of no small regret that Great Britain was almost the only civilised country which was not officially represented. The reception of the members of Congress at court by the Archduke, in the evening, was an equally striking spectacle from the variety of picturesque costumes of the officials present. The number of delegates representing universities, scientific societies, municipal bodies, corporations, etc., is very large, and in most instances the delegates are present at the Congress, though it is to be regretted that in some instances they are conspicuous by their absence.

TIME AS A FACTOR IN EDUCATION.

PROBABLY no better enumeration of the qualifications of the ideal pharmacist has yet been published than that embodied in a descriptive account of the Illinois College of Pharmacy, recently sent out by the Northwestern University, Chicago. As his position is there defined, the pharmacist must be fitted to form a correct opinion with regard to the identity, quality, and purity of medicines, and to combine and dispense them accurately, applying for those purposes the best means which scientific training affords. To this end, he should be practised in qualitative and quantitative analytical methods and in the use of the microscope, and grounded in the scientific principles of pharmaceutical work, as well as in its practical operations. As a result, "he should be equally well prepared for the best professional service at the dispensing counter, to aid

the physician as the chemist of the medical profession, to act as public analyst, especially for the protection of health, to undertake the work of the manufacturing laboratory, or for any related technical pursuit."

In attempting to realise this ideal American pharmacists are influenced by very similar motives to the German "apothekers" who, as recently shown in the *Journal* (*ante*, p. 151), hold the view that the pharmacy of the future will be a hygienic institute adapted to modern requirements. In Germany, it is proposed on the part of the pharmacist that he should prepare himself for assisting medical men more fully than heretofore by putting himself on the same educational level as the latter, and similarly in America it is recognised that a longer special training will be required by the pharmacist of the future. It has therefore been decided by the authorities of three universities in the United States not to confer the title of "pharmaceutical chemist" until after the completion of a two years' special course, with about nine months' full work in each year, and the lead thus taken is being followed by several of the most prominent American colleges of pharmacy. There is little reason to doubt that the time is ripe for such a change, for it must be allowed generally that the realisation of the ideal depicted will involve the attainment of a much higher standard by pharmacists generally, and this in turn will necessitate a longer period of preparation.

The importance of time as a factor in education is very clearly stated in an editorial article in the *Apothecary* for August, by Dr. OSCAR OLDBERG, Dean of the Illinois College of Pharmacy, who points out that success in pharmaceutical or other education consists not merely in the mastery of facts, their digestion and assimilation, but chiefly in such discipline of the mental faculties as will fit the student to use those faculties intelligently, successfully, and promptly. Such discipline of course requires a considerable amount of time, and cannot be obtained in the shop, as whilst working in the pharmacy there is little opportunity for the application of careful thought and deliberate study to the subjects included in the pharmaceutical curriculum, and shop training therefore cannot in any degree replace a proper college course of study. But, again, the discipline cannot be obtained by a very brief stay at a school of pharmacy, for the student cannot then be well trained, and if he leaves imperfectly prepared for his life-work, his subsequent opportunities and surroundings are frequently no longer favourable to as rapid development. Dr. OLDBERG urges therefore that the minimum amount of time exclusively devoted to college training should be not less than forty weeks, and he concludes by asserting that there should be no question about the real necessity of an additional course of nearly twice that amount of actual school work.

EDUCATION DURING APPRENTICESHIP.

WHILST the question of the length of time that should be devoted to the educational course in pharmacy is an equally important one in this country, it is more difficult here apparently than in America to induce students to devote any extra time to college work. The system

in vogue here has been briefly described as "an unadulterated system of examination"—no period of instruction whatever being insisted upon in connection with any of the British pharmaceutical examinations, and, except in a limited number of cases, no thoroughly satisfactory scientific and technical training being undergone by the numerous candidates presenting themselves. Though in practice necessity teaches them that some definite course of school instruction is requisite, and the great majority of candidates for registration as "chemists and druggists" have received a more or less limited tuition in the essentials of the examination syllabus, it is quite exceptional to find that they spend anything like sufficient time for the purpose. The time spent at a school of pharmacy is usually no longer than is absolutely necessary to acquire sufficient knowledge for examination purposes, and, brief as this period of continuous study is at best, its value is often yet further discounted by the fact that the students are at entry imperfectly or not at all prepared to commence the systematic study of the various scientific and technical subjects, a knowledge of which is required under modern conditions.

Now, the experience of the past fifty years has proved that British pharmacists have, by the aid of regular study during apprenticeship, been enabled to dispense with a very prolonged course of college training, and yet hold their own amongst the pharmacists of the world, and there would appear to be no reason whatever why, with a reasonable amount of diligence, apprentices should not now, within a limited time after the expiration of their period of pupilage, be in great measure prepared to pass the qualifying examination. It would appear, therefore, that the present unsatisfactory state of affairs is in great measure undoubtedly the result of mispent time or misplaced labour during the period of apprenticeship, when the elements of the various sciences upon which pharmacy is based may, under existing conditions, best be acquired. At the same time it would be inadvisable for candidates to rest content with the knowledge they may have acquired during pupilage, and depend upon that alone, though such knowledge if systematically acquired will always be of value and effect a considerable saving of time later in the student's career. The chief desideratum is that these early studies should be conducted systematically, so that progress will be sure, though gradual.

Accordingly, to the end that pharmaceutical students should have some better guide in their elementary studies than now seems to be generally available, it has been decided to publish in the *Journal* for September 15 a number of articles specially addressed to them. These will deal with the different subjects in the pharmaceutical curriculum, and the object kept in view throughout will be not to suggest methods of preparing for examination, but to indicate to some extent how students may enter upon a proper course of education, to which examinations will necessarily be subordinated.

CHEMISTS' ASSISTANTS' ASSOCIATION.

THE next reunion of members of the Chemists' Assistants' Association will be on September 11 when an excursion will be made to Watford.

British Pharmaceutical Conference.

MEETING AT OXFORD.

SECOND DAYS PROCEEDINGS.

(Continued from p. 187).

The next communication was the following:—

NOTE ON PHOSPHORUS PILLS.

BY R. H. PARKER, F.C.S.

Phosphorus pill-mass prepared with a fatty or resinous basis, beside being troublesome to prepare, difficult to preserve, and in some cases impossible to digest, is often found inconvenient at the dispensing counter on account of its bulky character and its disposition to produce crumbly masses when combined with other ingredients. Pills freshly prepared with a solution of phosphorus in carbon bisulphide diffused through liquorice powder are not open to these objections; it seemed, however, desirable to determine whether such pills are permanent, and contain the full amount of unoxidised phosphorus.

I will first describe in detail the exact method adopted in preparing, for example, two dozen pills.

Take of—

Phosphorus, the prescribed quantity for 24 pills.	
Carbon bisulphide	30 minims.
Liquorice root, in powder	24 grains.
Glycerin	4 minims.
Tragacanth gum, in powder	2 grains.
Syrup, a sufficient quantity.	

Dissolve the phosphorus in the bisulphide, pour the solution upon the liquorice powder in a pill-mortar, stir uniformly within the smallest possible space, by means of a spatula, until the solvent is nearly evaporated (no portion should be allowed to assume an appearance of dryness); as soon as the mixture becomes nearly solid, and while still moist with bisulphide, add a sufficient quantity of syrup to form a soft pill-mass, and incorporate quickly until homogeneous. Any other prescribed ingredients may now be added *secundum artem*, and the mass divided into twenty-four pills without undue exposure; no coating is necessary.

Not finding a recorded method for the determination of free phosphorus in pills, I decided to try extraction with carbon bisulphide, oxidation to phosphoric acid, and final titration with standardised uranium solution. This method gave very fair results. A solution of uranium acetate was prepared and titrated against sodic phosphate; its value was found to be 1 c.c.=0.002298 phosphorus.

Experiment 1.—0.2 gramme phosphorus was oxidised with nitric acid in presence of a fragment of iodine, evaporated until nitrous fumes ceased to be evolved, diluted with water, slight excess of sodium bicarbonate added, then acidified with acetic acid and made up to 229 c.c. with water; of this solution 40 c.c.=15.1 c.c. uranium solution, i.e., 0.1986 phosphorus found.

Experiment 2.—0.0472 gramme phosphorus was dissolved in carbon bisulphide, evaporated to dryness, the residue oxidised, and an acetic solution prepared as in experiment 1, diluted with water to 50 c.c. Of this solution 20 c.c.=8.1 uranium solution; i.e., 0.0465 phosphorus found.

Experiment 3.—0.4 gramme phosphorus in 2 c.c. carbon bisulphide poured on 6 grammes of liquorice root powder and made into 100 pills, in the manner described in the early part of this note. Ten of these pills were kneaded in a glass mortar with several successive quantities of carbon bisulphide, the mixed solutions evaporated to dryness, the residue oxidised, an acetic solution prepared as before and made up to 50 c.c. with water. Of this solution 20 c.c.=6.7 c.c.

uranium solution; i.e., 0.0385 phosphorus found. The remainder of these pills, examined in a similar manner at intervals of three months showed practically no diminution of phosphorus. A sample of pills on the table prepared as already described, each containing $\frac{1}{10}$ of a grain of phosphorus, and without any kind of coating; they have been kept in an ordinary pill box, occasionally opened and the pills handled since January, 1889—a period of nearly six years. They evidently contain the phosphorus exactly as when first made, for the slightest superficial scratch still produces phosphorescence, and a central section exhibits the same phenomenon over the entire surface. These pills rapidly disintegrate even in cold water, and without the assistance of massage.

The conclusions are obvious—that phosphorus pills may be easily prepared by this method without material loss or oxidation, that they are permanent, and that no coating is necessary for their preservation.

Mr. INCE said he was quite sure they might congratulate the author on his mode of making phosphorus pills; there were very many formulae at present for this particular preparation, and as far as he was concerned, he thought nothing ought to be attempted with phosphorus or similar substances unless you could effect entire solution. It ought not to be allowed to enter into combination, except in a state of solution. He entirely agreed with what had been said about the comminution rather than solution of phosphorus by oil or fat; they got it finally comminuted, but no more, and he thought that was more or less dangerous. Officially they were bound to follow the instructions of the B.P., and, following it with great care and attention to temperature, they got a fairly good result; but he objected to that formula altogether, because the phosphorus was not combined in a perfect state of solution.

Mr. MARTINDALE said after all was it not a form of comminution in the method followed by the author, who got the phosphorus in solution in bisulphide, and then precipitated in the pill. He had paid a great deal of attention to this subject for the last twenty-five years, and he must say he preferred to keep the phosphorus in solution always. The formula which he published some twenty years ago was that of dissolving it in cacao butter. A one per cent. solution could be made in that substance which could be easily rolled out into pills, and if they were fairly freshly prepared, the phosphorus was in the most active condition in which it could be administered, and in that condition was easily digested. The phosphorus Mr. Parker mentioned was only in a precipitated condition. It melted at 110°, above the temperature of the body, and in that way could hardly become completely digested when swallowed, and, therefore, he hardly thought the full dose of phosphorus would act. It was true they often had to combine phosphorus with other ingredients, and other processes of dissolving it in bisulphide and adding the other substances might be convenient. Mr. Groves suggested about a year ago a mode of emulsifying phosphorus to the finest condition by following Mr. Parker's process to this extent—dissolving in bisulphide, adding that to yolk of egg, stirring quickly, and adding a little chloroform to prevent oxidation. The emulsification of the bisulphide solution with yolk of egg was quick and complete, and on afterwards adding some liquorice powder you produced a mass which Mr. Groves suggested an ingenious way of keeping. He smeared the stopper round with honey and put a little cotton wool inside with a few drops of ether. This mode of preserving phosphorus pill mass might be used for any mass containing phosphorus, but phosphorus pills would not keep for any length of time.

He had some made on the 14th of April last year, and they were now completely oxidised: there was no glow of phosphorus about them, although they were varnished. He held that phosphorus pills should be freshly made. As to nostrum-mongers making these pills a specialty, it was an absurdity. Phosphorus should be dispensed as quickly as possible, and not kept in stock.

Mr. GERRARD said that at the time when phosphorus was first introduced he remembered very well the trouble he had to get preparations of it in a satisfactory condition. He suggested common resins as a solvent, but that was improved upon by Mr. Abrahams, of Liverpool, who suggested balsam of tolu. That suggestion was taken up by the pharmaceutical authorities, and the method introduced as the basis of the official pill. Since that time there had been considerable improvement made, and Mr. Martindale himself had done excellent work in that direction. If Mr. Parker had looked up the 'Year-Book of Pharmacy' he would have found that in 1878 it gave a process which was quite on parallel lines with the one now brought forward. He suggested then that they should be made by dissolving the phosphorus in bisulphide of carbon, pouring this over the compound tragacanth powder, moistening it, adding a little chloroform to prevent oxidation, and rolling the mass out quickly.

Mr. HARDWICK said the point of this paper was not the way of making phosphorus pills, but a statement that they would keep for a long time without oxidation. Mr. Parker thoroughly condemned all kinds of fatty bases for phosphorus pills. Now they often had to dispense phosphorus pills with a number of other ingredients, such as *nux vomica*, *cannabis indica*, quinine, or even strychnine, and often in practice a very useful manner of obviating the difficulty of weighing out minute quantities of phosphorus, such as half a grain, or less, was one the suggestion of which he got from an early edition of Mr. Martindale's book. He dissolved the phosphorus in bisulphide, and added a fatty base, the most convenient being suet, with a small addition of vaselin and kaolin to make it sink in water. Then he kept the composition under water, as he kept stick phosphorus, and taking out small portions and blotting off the moisture he was able to weigh it without difficulty, and make up pills easily which rolled well and kept their shape.

Mr. WILLIAMS said he was particularly interested in Mr. Parker's paper, because it was contrary to all recent opinion as to the stability of phosphorus in pills. They were always taught that it certainly did oxidise, and he was astounded to hear that a preparation had been kept six years and still exhibited phosphorescence. A short time ago he saw that amorphous phosphorus had been highly recommended as producing exactly the same result as ordinary phosphorus, but he had not been able to confirm the statement by anyone who had had experience of its use; but it seemed to him the advantages were considerable, provided its medicinal value was equal to that of ordinary phosphorus.

Mr. GURNEY said he remembered some years ago dispensing a prescription containing 2 grs. of amorphous phosphorus in each pill. He at first thought the dose must be excessive, and consulted the medical man, but he said it was all right; 2 grs. of amorphous phosphorus was a perfectly safe dose, and would have no more effect than one-thirtieth or one-fortieth of a grain of the ordinary crystalline form. The prescription was dispensed several times during a week or two, and he never heard anything more about it.

The PRESIDENT said he did not wish to stop discussion, but everyone would agree with his own experi-

ence that his natural life was not long enough to indulge in perpetually going back to the rudiments. Allen and Hanburys in the *Pharm. Journ.* for May, 1876, published a formula for phosphorus pills by solution in bisulphide of carbon, and mixing with soap, guaiacum, and liquorice, which left nothing to be desired. Essentially this form was the same as Mr. Gerrard's, except that there was soap and guaiacum in it. It had been reproduced in the 'Art of Dispensing,' and was one by which twelve, twenty, or a million pills could be made, and it had been used by thousands of pharmacists, who were content to take a thing of this sort and save themselves the trouble of needlessly trying experiments over and over again. That pills should keep for ever was not expected, or that pills made on the other side of the Atlantic should be taken on this side was ridiculous. At the same time, they did not want to make every preparation day by day. He had made pills according to this formula combined with other ingredients, and they were practically unalterable for a long period. It so happened that this formula in combination with other ingredients was on the shelves constantly, and when he saw this note was to be read he told his assistant to get a bottle of the oldest phosphorus pills he could find, to examine them, and to see whether they were soluble and contained unaltered phosphorus or not. He gave him a report to the effect that they were as soluble as pills could be, dissolved at the temperature of the stomach in a few minutes, and contained practically unaltered phosphorus. When they had a formula which was practically so satisfactory as this, it was not desirable to spend their time in endlessly studying rudiments when there were great chemical problems in front of them and more important things to be studied.

Mr. PARKER said that Mr. Martindale's formula of phosphorus dissolved in theobroma was no doubt very satisfactory if you could roll out the pill mass uncombined with other ingredients. But he found the formula now suggested gave a mass that could be mixed with almost every ingredient that came to the dispensing counter. Phosphorus should be administered in solution probably, but in this case he took 24 grs. of liquorice powder, dissolved the phosphorus in 30 minims of fluid, and made a sort of mud of it, and by that means every cell of the liquorice powder was equally permeated by phosphorus. The pill when finished dissolved readily in cold water, and if introduced into the stomach disintegrated directly into an enormous number of minute particles of phosphorus. Whether that was different in physiological action to phosphorus dissolved in theobroma he could not say. He must disclaim any idea of novelty in the formula. He did not claim that in the paper. Mr. Lloyd Williams had referred to the value of amorphous phosphorus. He had repeatedly dispensed large quantities of it, and it was stated by many authorities that it was inert. Certainly very large doses of it had been given, and if quite free from any other form of phosphorus it probably was inert. Particular attention must be given to see that it contained nothing but amorphous phosphorus. The President complained of his returning to rudiments, but he would not have taken the trouble to investigate whether these pills, after being kept for six years, were as good as when they were made, if he had found any record of that fact. He could not find any statement as to the keeping properties of pills made in this way, or whether, after a week, they would contain free phosphorus or not. He simply conducted this work for his own satisfaction, and recorded the results to save other people from going through the rudiments.

The following paper was next read:—

THE NOMENCLATURE OF OFFICIAL REMEDIES.

BY JOSEPH INCE.

In view of the advent of an imperial pharmacopœia, I venture to say a few words upon this subject. There is always a fear when the word nomenclature is mentioned lest some fanciful theory should be introduced, ingenious, possibly, but of little practical use.

I have no speculative suggestions to advance, and all I ask is that as new official remedies claim adoption to which latinised names must of necessity be given, the construction of this nomenclature should follow the ordinary rules of declension which are commonly known and accepted. We have already in the body of the pharmacopœia several words which have been left as indeclinable, while the Addendum is in evidence that their number is on the increase—a matter which reflects on the scholarship of the day, and embarrasses the prescriber, who, owing to the technical arrangement of a prescription, has to frame a terminology with declensions of his own.

I would leave untouched the whole series of undeclined words which do not naturally admit of classification in order to avoid any manner of innovation. Such are:—*Elemi*, as in *unguentum elemi*; *gummi*, as in *acacie gummi* and *eucalypti gummi*; *buchu*, as in *buchu folia*, *infusum buchu*, and *tinctura buchu*; *catechu*, as in *infusum catechu*, *pulvis catechu compositus*, *tinctura catechu*, and *trochisci catechu*; this last is correctly made neuter and called *catechu pallidum*.

Tolu cannot be included, for it has no representative Latin noun, being used as an adjective throughout. Thus we get *syrupus tolitanus*, *tinctura tolitana*, and *balsamum tolitanum*.

But when we turn to latinised terms which obviously belong to certain definite declensions, it is a reasonable request to make that they should not continue to be inserted in a standard work without reference to the common rules of construction. On the threshold is *liquor gutta-percha* (perhaps an oversight). The U.S.P. recollecting *menaa*, æ, gives *liquor gutta-perchaæ*.

It has long been an accepted rule, with regard to which there has been an entire consensus of opinion, that neutral principles should be made to end in *æum*, and that the English equivalent should end in *æ*; while alkaloidal principles should be made to end in *ias*, for which the English equivalent should be *ine*.

This excellent arrangement has proved a great gain to the chemist, the physician, and the student, for it is a nomenclature which conveys definite information. One sees, therefore, with regret, certain deviations which have crept in unawares.

Aloin, correctly anglicised *aloin*, is as much entitled to be *aloinum*, as *bensoinum*, *anglice* *benzoin*.

Pyroxilin, the type of an *inum* word, is probably a misprint for *pyroxylum*, but for *pepsin* no such allowance can be made; it should be *pepsinum* (not *pepsina*, alkaloidal form), and would cease to be an anomaly.

In no spirit of fault-finding is the further remark that equal care should be taken in rendering the English equivalent of these words uniform. If we say, on principle, *ergotin*, *paraffin*, and the like, because the Latin form is *ergotinum* and *paraffinum*, we are scarcely at liberty to write *gelatine* from *gelatinum* and *glycerine* from *glycerinum*. These are commercial terms, but they somewhat confuse a student who has had plain rules laid down for his guidance, and no objection would be taken by the trade to find them accurately named in an official standard book.

It has long seemed to me desirable that three common forms of declension should be followed in cases where they may be required.

1. Neuter nouns ending in *al*. (Third declension).

Example. *Animal*, *animalis*.

2. Neuter nouns ending in *ol*. (Third declension).

Example. *Alcohol*, *alcoholis*.

3. Masculine nouns ending in *o*. (Third declension).

Example. *Sapo*, *saponis*.

Other nouns at present taken as indeclinable, as *amyl* and *sumbul*, are open to discussion, and with respect to such, differences of opinion would exist.

I should like to see the title *syrupus chloral* banished from the Pharmacopœia, as it has long been from the prescription of the practitioner, and let it enter into uniformity as *syrupus chloralis*. *Sulphonal* (in the Addendum) enters as yet into no other preparation, but should that happen, its inflexion would be already determined. Meanwhile, the prescriber writes *sulphonalis grana quindecim* when he would indicate the dose.

If we say, as we certainly do, guided by the Pharmacologia—

R *Camphoræ* (*Alcoholis solutæ*) *ʒi*.

or

R *Camphoræ* (*alcoholis ope* in pulv.

redact) *gr. viii.*

surely the title *emплаstrum menthol* should no longer be retained, but give place to *emплаstrum mentholis*, and *thymol*, with all companion words, would follow suit.

Former editors have foreseen the difficulty which occurs in *matico* and *pimento*, and have latinised both as *infusum maticæ* and *aqua pimentæ*. Let them stand, especially the latter, which comes from *pimenta*; but it seems advisable, in anticipation of the future, that other or new terms which may resemble *sapo* should have the same declension, while *kino* and *cusso* might obey the same rule. If we say *linimentum saponis* and *cataplasma carbonis*, why say *tinctura kino* and *infusum cusso*?

In conclusion, let me express the hope that the above remarks may not be considered in the light of a mere literary excursus.

The class of words to which attention has been directed must grow and multiply, and then the full inconvenience of a heap of undeclined pharmacopœial titles will be felt.

I advocate no novelty in nomenclature, but only recommend the systematic adoption of known grammar rules to meet new requirements.

The PRESIDENT said in view of the possibility of a new pharmacopœia being proceeded with at an early date this was a subject which would probably provoke some amount of discussion.

Mr. MARTINDALE asked what objection Mr. Ince had to indeclinable words such as *thymol*, *menthol*, and *sulphonal*. The custom had been that when a noun was taken from one language into another, as when Greek terms and Arabic terms were introduced into Latin, they were introduced indeclinably, and he thought that should be the rule, and with such words as *thymol*, *sulphonal*, *chloral*, *amyl* and others it was best to make them indeclinable. What object was there in making them declinable? They could understand from the context of the prescription what the meaning was. When they saw *amyl nitratis* they knew it was in the genitive, and the same with *chloral hydras*, that it was hydrate of chloral. It was plain to all that the *chloral* in that case was genitive. One of the scholars who compiled the first British pharmacopœia was very strong on that point. He held that they should render *chloral* indeclinable, and not make it *chloralis hydras*. With regard to the incongruity of the terms *gelatin* and *glycerin* being put into the Latinised terms they followed the common commercial rules, in spite of

what had been accepted as the scientific termination of those two words. Glycerine was spelt in Watts's 'Dictionary' without the final "e," and it was so consistently in scientific work, but the common commercial rule was to give the final "e." If the "e" were dropped it would look as if it were something else.

Mr. ATKINS said, assembled as they were in a great classic institution where, of all places, Greek and Latin would be most strictly and authoritatively defined, he would venture as a practical principle to express the thought, which was in harmony with Mr. Ince's opinions, that there ought not to be anything such as was called in his early days "dog Latin" in pharmacy. Their Latin ought to be up to date, and the Latin of the Pharmacopœia and that of the apprentice should be as far as possible strictly in harmony with their classical instincts.

The PRESIDENT said he could only assume, seeing so few joined in the discussion, that they would all sit at the feet of Mr. Ince on a classical subject. He hoped the future pharmacopœia authorities would do so, and listen to what he had to say. He could quite understand that when a man coined terms it was exceedingly inconvenient that those terms should be submitted to classical authorities and subjected to classical rules, because if they looked at the advertising pages of the press it would be seen that they often went to Southampton Buildings and registered a term and obtained a proprietary right in it, and it would be exceedingly inconvenient if those words had to submit to classical laws. Anyone who had any regard for scientific nomenclature must deplore the way in which words came into use. What was meant by such words as "dermatol"? In their early days they examined students in Latin; they did not do so to teach them dog Latin, but that they should be able to correctly translate a prescription written in Latin. He hoped that this short paper would have considerable effect, and that the pharmacopœia authorities would not only make the new edition worthy of England and of the nineteenth century in the formulæ selected, but also in the names, and in the manner in which they were used. He would not criticise the United States Pharmacopœia in this respect, because America was a law to itself; it observed all that was convenient, and nothing more; but with regard to setting the fashion for the use of the English or Latin languages they need not go across the Atlantic.

Mr. INCE, in answer to Mr. Martindale, said he could not see the advantage of wandering about utterly adrift, without rule and guide in the great number of new preparations which must of necessity be introduced. In order to keep these within the bounds of common sense, and not what was called classically, he had taken special pains to cut down the paper to one-third of what it might have been, and to confine his remarks to suggestions which he thought were of use and might be adopted. That was why he advocated introducing some plain, definite rule, known to everybody who had passed the fourth form, by which a word with a certain termination, and that belonged to an ordinary thing and not to a novelty, should follow the ordinary rule for its declension. If you had a word introduced into the Imperial Pharmacopœia with that termination, why on earth should it be left indeclinable. Those who came afterwards would think it was owing not to any theory, but rather to a want of acquaintance with the subject. He had very carefully limited his suggestion to the three plain ordinary declensions. When you had words with those ordinary terminations, why should they all run adrift. Those who prescribed had by necessity to employ a certain definite mode of conveying their ideas, which was

called a prescription; they could not help themselves. They had to put all their quantities in figures, which had to be translated properly by candidates for examination. They had to know the correct Latin for those figures and the case, but the ingredient which formed the prescription itself had from necessity to be put in a certain case, the genitive. The result was the medical profession went far in advance of what the rule of construction laid down. They took these words in "al" and made them "alis," but that was nothing arbitrary. He wanted to get out of any notion of his own, or any arbitrary formation. All he asked for was that ordinary grammatical rules might be followed. Mr. Martindale asked what was really the object, because they could guess by the context at what was meant. But they did not allow the students to pass in that way. They took care when they had a prescription before them that they should be able to translate it correctly, and not only to understand the meaning, and why they should require from students that which they did not require from the official pharmacopœia he could not understand.

The last paper read was on :—

ENGLISH MEDICINAL RHUBARB AND HENBANE

BY RICHARD USHER.

Rhubarb.—Although the introduction of medicinal rhubarb into England is dated by Parkinson as far back as 1629, no real experiments in its culture and preparation for medical use appear to have been made till 1762, when a quantity of seed was sent from Russia by Dr. Mounsey, from which period till about 1800 it was successfully grown in small quantities by many scientific men, after which it was cultivated at Banbury on an increasing scale, and is now known in the commercial world as a general article of trade, and not only is it consumed in considerable quantities in this country, but is exported largely to various parts of the civilised world. The origin of the plantations of rhubarb in my possession, and now extending over forty acres, will be best traced by the following extracts from the 'Transactions of the Society of Arts.' In 1789:—"The Society, in consideration of his merit, and to promote as much as in them lies the growth and cultivation of so valuable a drug, voted their silver medal to Mr. Hayward as a bounty." In 1794:—"The following accounts and certificates respecting the growth and cure of rhubarb have been received, the gold medal being the premium offered for cultivating the greatest number of plants, was adjudged to Mr. William Hayward, of Banbury. The following is the testimony of Dr. Pereira: In 1789 Dr. Hayward obtained a silver medal, and in 1794 a gold medal from the "Society of Arts" for the cultivation of English rhubarb. Dr. Hayward died in 1811, and the plants were purchased by my late grandfather, Mr. P. Usher.

As a proof that even at this early period of its cultivation English rhubarb had obtained the confidence of scientific men, it may be stated that in 1773 rhubarb of British growth was used at St. Bartholomew's, St. Thomas's and Guy's Hospitals, and was being experimented on at several others. According to the testimony of Sir Alexander Dick and Dr. Hope of Edinburgh, in 1784, but little rhubarb was used by the apothecaries of that city, except that which was produced in Scotland, and it was considered in respect inferior to Russian. About the same time English rhubarb was put to a severe test at Bath by Drs. Falconer, Parry, and Fothergill, all of whom attested its merits. Dr. Falconer remarked that two of the specimens submitted to them answered the external marks to the character of the foreign; the others were rather inferior in delicacy of taste to the

Turkey, but superior in other respects to the East India. In 1810 Dr. Thornton, then lecturer on botany at Guy's Hospital, referring to the encouragement given to the cultivators by the Society of Arts, makes these remarks: "This account may serve to show both the ardour of this respectable Society in encouraging the growth of this useful article and the persevering industry of some gentlemen in overcoming all the difficulties attendant on introducing a new plant into cultivation, finding out the means of curing it as an article for extensive sale, and overcoming the prejudices of such as cannot persuade themselves that a drug of British growth can bear competition with what is sent us from foreign countries."

If at a later date the prejudice against English rhubarb increased, there must have been other causes than those existing on the first introduction of the plant. One cause of the subsequent change in public opinion may have arisen from the partial introduction of new varieties of the plant. From the earliest period in its history there appears to have been a confusedness in the evidence as to its real character, and whether foreign rhubarb was produced from the *Rheum palmatum* or the *Rheum undulatum* remained for many years an unsettled question. At the present day, however, in addition to these varieties we have a further supply afforded by *Rheum officinale*, derived from the plant introduced into this country in 1867 by the late Daniel Hanbury as a source of the true Asiatic rhubarb. As far as the question relates to rhubarb grown in Great Britain, the stronger probability is, that, after it was imported, several varieties were produced by repeatedly propagating from seed, when a discrepancy was observed at variance with the earliest descriptions recorded. To show the extent of those changes, I may remark that in the last instance in which I noticed the effect of seedling cultivation about forty years since, I found the stalks and leaves more than double the size of those produced from offsets, a circumstance sufficient to account for the introduction of such varieties as the Victoria and other large sorts now so common in our gardens, which when propagated from seed still keep working change upon change. So convinced have I been for a long time of the injurious tendency of this system, that I have studiously avoided the use of seed altogether, and the plant has so far receded to its original type that not one has produced ripened seed during the last thirty years. It is a fixed trait in the cultivation of medicinal rhubarb, as it is in most bulbous plants, that if produced from offsets only it ceases to produce seed, and if raised from seed, each succeeding generation produces seed also, adding variety to variety almost indefinitely. Assuming, as an incontrovertible fact, that the plant has now for such a lengthened period been propagated from offsets as to be incapable of bearing seed, it will guarantee the conclusion that if during a number of years when its cultivation was pursued by a larger number of growers for the purpose of making experiments, and each one in haste to enlarge its growth resorted to seed propagation, it degenerated from external causes, it is equally logical to infer that, the causes having ceased which led to its deterioration, it has now regained its specific distinctiveness, and is not likely to diverge again into any transition from its central type. It is thus quite possible to account for the previous deterioration of the plant for medical uses which caused the strong prejudice existing for many years against it, and the remaining doubts still expressed respecting the real properties of English rhubarb, but that a powerful reaction has taken place in its favour since the plant has been restored to its primitive form of development there is most ample testimony, not only in the increased demand

for it at home and abroad, but in the evidence of eminent medical practitioners. In addition to the improvement which became apparent in the plant by the entire exclusion of seedlings, an important change has been effected in the mode of drying by exchanging a high artificial temperature for a more gradual one, the process in the first stages being effected by the application of a strong current of atmospheric air, which has not only greatly condensed the root and rendered it less porous, but has given it an appearance approximating more closely to foreign. The progressive but certain destruction of all former prejudices existing against the use of English rhubarb may be adduced from facts much stronger than theory. The first is that in 1845 the extent of land appropriated to the cultivation of the plant did not reach ten acres; whereas now it has reached upwards of forty acres, and even this is quite insufficient to supply the foreign demand for trimmed English rhubarb. If the home consumption of this drug had remained stationary the export trade alone would have afforded every facility for extending the plantation, a fact most strikingly shown by the article being sent to ports such as Odessa, from which East India rhubarb is sent to Great Britain. A large proportion of the trimmed rhubarb has for several years been shipped to the American market, where it has become a regular article of commerce.

Henbane.—Through some erroneous impression which has long existed, and still continues, respecting this very important plant, the first year's growth is spoken of as the annual, than which nothing can be more palpably wrong, as the two articles when produced for use vary as essentially in their external appearance as in their constituent properties, applying this simple test only, that the annual plant when dried consists both of leaves and blossoms, whereas the first year's growth of the biennial must necessarily consist of leaves only. Assuming that when the second year's growth of the biennial plant cannot be procured recourse must be had to the first year's growth as a substitute, the pharmacopoeia should have made known the comparative strength of the latter. No objection could have been made to such directions when it could be shown that a second class article must of necessity supplant a superior one, as occurs doubtless not only in this but in many other medicinal preparations. If in the use of the two separate articles now under consideration the same instructions are carried out, namely, to use two ounces and a half of the dried plant to a pint of tincture, and one should prove to possess two or three times the strength of the other, it assumes a serious aspect in the administration of so important a medicine. We require a new definition altogether of the plant when dried for use. Instead of making two divisions only as at present, annual and biennial, it should be classified as follows:—

- Biennial henbane of second year's growth;
- Biennial henbane of first year's growth;
- British annual henbane;
- German henbane.

This would at once simplify the question, and prevent those erroneous views which have very widely prevailed amongst all parties concerned in its preparation and use. It will be seen that I have arranged the above classes in the order of their value. The two last-mentioned, the British annual and the German, although most extensively used, are so thoroughly undeserving notice, that they require mention only to guard the public against their use altogether. Of these two the British annual is perhaps preferable to the foreign, and its appearance, unfortunately, approximates sufficiently close to the second year's growth of the

biennial plant to enable the vendor to pass it as such; and if no other criterion existed than that it possesses no flavour or aroma, that would be sufficient to detect the imposture. Independently of this test, the leaves will be found much shorter, and occasionally will be seen a pure primrose colour blossom, which never occurs in the beautifully streaked blossom of the biennial; but the very fact of the appearance of blossom in the sample, that blossom being generally so much like the blossom of the biennial, leads to the very erroneous conclusion that it is the same plant.

Owing to the extreme price which the dried biennial plant of the second year's growth has realised in former years, the consumers have not given that encouragement to its production which its intrinsic value merits. The great difficulty, however, which has thus been felt till very recently, that of not being able to obtain a supply except at a most exorbitant price, is now to a great extent obviated. After a long and careful study of the cultivation of the biennial henbane of second year's growth, success has been achieved in preserving the plant from the attacks of insects to which it is ordinarily subject, and by this the loss and temptation to substitute inferior varieties, to which both growers and consumers have been exposed, is prevented.

The PRESIDENT said he ventured to think that this paper, although written by a grower of herbs in the county, was of particular value, and he thought whenever the Conference went anywhere where there was some natural product or herb cultivated which was used in medicine, it would be very useful to have a paper on the subject. He certainly thought Mr. Usher had contributed something of value, both from a historical point of view and also from the practical facts he had recorded as to the cultivation of rhubarb from offsets instead of seeds. If the demand for this English rhubarb only grew, it would be a profitable field for English farmers. Henbane also was a drug of extreme importance, and he had not the least doubt everyone present would support him in saying that the uncertain estimation of the value of henbane was doubtless due to the fact that there were several varieties manufactured into tinctures and extracts. The Pharmacopœia clearly defined what henbane should be, but there was strong probability indeed that other varieties did go into medicinal use, and that was one of the causes of the differences of opinion which existed as to the clinical and therapeutic value of henbane and its preparations.

Mr. DRUCE said there was a great deal to be said on the point of general hybridisation. Mr. Usher seemed to have cultivated sometimes one variety of rhubarb and sometimes another, but they were closely allied species, and hybridisation went on. These products were so varying that you never knew what you had got. He might accentuate that by an illustration. Their late lamented townsman, Dr. Romanes, was making experiments on the hybridisation of animals, and he found that the progeny of the white albino rat and the common brown rat were not piebald as was expected, but simply brown rats, but that the progeny of the second generation of brown rats, the offspring of the white and brown, were piebald. So with hybridised plants, the second generation might come true, but the third might be as variable as possible. M. Nodont, experimenting with stramonium, found he could stamp out the influence of one parent with seven or eight generations of cross fertilisation, but he had not at that time got the stable parents you would have at the first, but instead of that a plant which varied almost infinitely, not in the direction of one of the

assumed parents, but in an unexpectedly different way. That might account to some extent for the extreme variability of the rhubarb under culture.

Mr. REYNOLDS said he had rather a special interest in this subject, inasmuch as the rhubarb fields at Banbury were connected with his earliest recollections. Those who indulged in horticulture unquestionably rejoiced in this variability of nature, and the variety which came from the distribution of seeds of plants which were supposed to be nearly the same, but the horticulturist, like Mr. Usher, knew how to produce uniformity by taking cuttings instead of sowing seeds, and, therefore, it was in their own hands very largely. There were not many medicinal substances which were made the subject of cultivation instead of collection, so large a part of what came to them had been collected from Nature's wild garden, but they were nearly all old enough to recollect when cinchona had a wild origin, when forests were cut down in South America, and how rapidly science provided cultivated cinchona, and what enormous advantages ensued. Within the last few days he received from Mr. Moss, in London, a memorandum showing the price of quinine in the year 1832, from his father's price list. It was then 40s. per oz. If they wanted rhubarb cheaper, Mr. Usher could supply it, but whatever had been rewarded twice by the Society of Arts as a national benefit was certainly worthy of being introduced here.

Mr. RANSOM thought they were indebted to Mr. Usher for his interesting communication. The rhubarb was almost the only example of an English-grown drug that was not supposed to be of equal value to the foreign. If that supposition was mistaken, and it seemed not improbable, it would be interesting to have it proved, and it should be proved. Certainly there would be scope for much larger cultivation if it could be shown that medicinally it was as useful as the Asiatic. With regard to henbane, he could also emphasise what Mr. Usher said with regard to the confusion between the annual and the biennial. The two drugs were entirely different. When the annual was ordered, the leaves of the biennial plant were often intended. As to the order of the value in which they were held, he was not quite sure whether Mr. Usher meant the value in price or the actual medicinal value of the different kinds. They had had some remarks on that subject from Mr. Gerrard a year or two ago, and he might probably have something to say now. He had been much interested in hearing that Mr. Usher had succeeded in preventing the attacks of insects on henbane, which had been a great difficulty with many growers, and should be glad if he could give some information as to how it was prevented.

Mr. GERRARD said he had done a little in connection with the subject of henbane, both as regards growing and analytical examination of the plant itself and its various parts for the alkaloids contained. Early impressions were very difficult to get rid of. On the one hand, henbane was a very beautiful plant, as well as interesting, and produced rosette leaves the first year, then it grew up to a handsome plant, sometimes as tall as ten feet high. Naturally, being taught that the biennial henbane was the best, when they saw the plant in its natural condition, both the first and the second year growth, the one being a comparatively insignificant small plant, you were led to consider that the one which you had been taught was the best and had seen was the most handsome plant, naturally must be the best. It often happened when you came to put matters to the test things might be different. In the case of cinchona, there were large barks and small, and often the small barks were the better in quality. It was much the same with henbane. If you took the annual henbane leaves, not stalks with the flower tips, as

submitted them to analysis to extract the alkaloids, they would be found to yield as near as possible the same percentage of alkaloids as the first year's biennial leaf or the second year's biennial leaf, but if you wanted to get henbane which would yield a much more active preparation than either, you must take the biennial root of the first year's growth when it was very large. You would get from that three or four times as much alkaloidal matter as from the leaves or tips of either kind at any period. A great deal might be said about the quality of henbane in connection with the mode of treatment. If the crop, whether annual or biennial, were carefully collected, rapidly dried with the leaf a bright green, well preserved, not tied up in paper parcels or thrown in corners, it would keep for a considerable time, and in the course of three or four years would be found almost as good as when first prepared. He had shown by analytical figures that a badly dried specimen, old and brown, had undergone a certain amount of change, and the alkaloidal properties had become low; it was, therefore, necessary that farmers should take care in preserving these drugs, which owed their activity to an alkaloid. Again, heat to atropine and hyoscyamine was very deleterious indeed. If you took a little alkaloid—the pure base, not the salt—and warmed it in water, it would lose 20 per cent. of its alkalinity by conversion into an acid body with a new base. He was pleased to hear from Mr. Usher that he had been able to get rid of those pests which were such a nuisance in connection with henbane cultivation. It would have been interesting had he told them how. He had cultivated it on a small scale, and found the insects very troublesome; they would consume the whole crop in a few days. The biennial henbane was generally looked upon in the market as the best article, and was high in price, but he thought that was purely sentimental on account of the flowering-tops. The first year's growth of the biennial henbane was undoubtedly as good in alkaloidal quality as the second year's biennial tips, and the first year's or annual henbane, if the crops were well farmed, was practically as good as the others.

Mr. USHER said he was not an analyst, and was not able to add anything on that part of the subject. The substance he used to protect henbane against the attacks of insects was a mixture of salt, soot, sulphur, and lime, in equal quantities.

The PRESIDENT, having proposed a vote of thanks to Mr. Usher, which was unanimously carried, said he was sorry to say that the remaining papers would have to be taken as read, but they would be published in the *Pharmaceutical Journal*,* and the editor would be pleased to receive any letters from those interested in the subjects treated of, which would practically have the same effect as a discussion.

Presentation from the Bell and Hills' Fund.

The PRESIDENT said he could not open the business which had yet to come without making allusion to the illustrated handbook published by the editor of the *Pharmaceutical Journal*. It had already been very highly spoken of by the Mayor and others, and it was only right to take notice of it. This book was published in the hope of "further cementing the bonds which unite the British Pharmaceutical Conference with the Pharmaceutical Society of Great Britain and its official organ." Everybody knew that the connection of the Pharmaceutical Society with the Conference was not one that affected the Society in its executive or legal work, but merely arose from

the fact that the founders or leaders of the Society were the founders of the Conference, and had from the first almost been the leaders of it. The Journal had for many years published *in extenso* the whole proceedings of the Conference earlier than they could possibly get out the 'Year-Book,' and this was of very great value. The Executive had unanimously passed a resolution thanking the editor for his contribution on this occasion, and he personally desired to compliment him very much indeed on the way in which he had done the work. The members were requested to preserve the handbook, with the exception of a portion of one page, which was intended to be used as a nomination form for new members, and he hoped within a few weeks that the whole of those slips would be returned with names upon them, the owners of which the Executive would be delighted to elect. With regard to the Bell and Hills' Fund, he was not very well posted in the history of the matter, but he had the honour of receiving the books at Newcastle, and remembered that owing to the munificence of Mr. Hills a present of books was made to the local pharmaceutical association wherever the Conference went. There was no association at Oxford at present, and as it was a condition of this presentation that the books must be put where they could be accessible to chemists and druggists of the district for reference, and as the necessary information had not been supplied in time, the books had not been brought. Nevertheless, the presentation would be made in due course, the books would be sent to Oxford, and stored in a suitable place where they would be available.

Mr. DRUCE said the books would be placed in the Public Library of the city under special care; they would not be lent out, but would always be on the shelves for reference by pharmaceutical students and others, until a local pharmaceutical society was formed, and they would then be handed over by the committee of which he was a member to that society.

The Unofficial Formulary Committee.

Mr. LLOYD WILLIAMS then moved that the members of the Formulary Committee, who had conducted their work in a very able manner during the past year, be re-elected. He was quite sure that in their hands the interests of pharmacy would be perfectly safe, and they had to thank them very heartily for what they had done.

Mr. LINFORD, in seconding the nomination, said the action of the Committee had been of such really practical use to chemists and druggists that next, perhaps, to the Pharmaceutical Society they owed as much to the Formulary Committee as to anybody else.

The resolution was carried unanimously.

Mr. MARTINDALE, on behalf of himself and his colleagues, thanked the meeting for the honour of re-election. He said there was still work to do, and a new edition of the formulary would be ready in a week or so.

Place of Meeting for 1895.

Mr. BRIDGE, of Bournemouth, said it was with very great pleasure, but with a great amount of trepidation, that he came forward to offer a unanimous invitation to the Conference to visit Bournemouth. They could not offer anything like that hall, nor anything like Oxford, and the only excuse for going there after Oxford was that there was no other Oxford. They were about as young as Oxford was old, but still they were vigorous, and vigorous infants were sometimes interesting. He could assure them the invitation was unanimous; they had had several meetings to consider the point, and at the local association there was not a voice raised against it, and

* Papers taken as read at the Conference meeting will be published after the conclusion of the detailed report.

whatever Oxford or any other town had given the Conference, if they would accept their invitation for 1895 he could safely say that no city or town would ever have exceeded the welcome they would give them.

Mr. TOONE said he should like to add just one word in support of the invitation Mr. Bridge, who was president of the local society, had given. He had said very truly that they had nothing to show like those grand historic buildings which they had looked at with so much delight during the last two or three days. Bournemouth was a new town, though as far as population went it was as large as Oxford, and there were some rude people who, speaking of their growth, compared it with one of the edible fungi, but for all that, although they might have grown rapidly in the past, they had a large, important, and beautiful town at the present moment, and they believed they had a very great future before them. There was one pharmacy in the town which had over its door the legend "Established in 1844," and they always passed that gentleman's abode with veneration, and looked on him as one of the links with the prehistoric past. He could assure the Conference that they would do their utmost to make the visit a pleasant one. Nature had endowed them with beautiful gardens, with forest trees, and that which was such a charm in the summer time for those who lived in big cities, a beautiful sea.

Mr. GERRARD proposed that the kind and hearty invitation to the Conference by the representatives of Bournemouth be accepted. Mr. Bridge had said there was no other Oxford, and he might say there was no other Bournemouth. He had seen and learnt something of the rise of Bournemouth, and there was no doubt that it was a beautiful child which they would all like to go and see. Even those who had been before would like to go again, and he might say that they would have something of the old as well as the new. There was Christchurch Abbey, and Wimborne was not far off. He had spent many happy days in the district of the beautiful New Forest, which was very near with its botanical riches, and he hoped that the ladies now present and many others would also meet them at Bournemouth.

Mr. WARD (Leeds) seconded the proposal. They had had some reference made to the contrast between the antiquity of Oxford and the youthful vigour of Bournemouth, and it might be well for the Conference to renew some of the vigour of its youth by going to see this beautiful strong infant which had been described.

The PRESIDENT said their friends from Bournemouth would pardon him for saying one word about this new departure before putting the motion to the meeting and heartily supporting it. This year they had not an invitation from the town where the British Association was to meet, but a great deal of misapprehension had gone abroad with regard to the Pharmaceutical Conference, and he hoped they would bear with him if he brushed aside some newspaper paragraphs, the result of gossip which was quite wrong, and he was quite sure would deter small communities from the pleasure which they would have in receiving the Conference. The Conference did not require, as the British Association did, a guarantee fund; it did not require that the locality should spend a great deal of money in entertaining it, although if men possessed money why should they not spend it in entertaining their friends. If he went to visit a lord, and the lord chose to entertain him in a manner suitable to his position, he did not complain, and if he went to visit a peasant, and that peasant entertained him in the position in which he lived, he did not complain either, but he enjoyed the hospitality

of the peasant as he enjoyed that of the lord. That was the true English spirit of hospitality. He was not reflecting on their friends at Ipswich, who had been deterred, no doubt, by these things from sending an invitation to enter into rivalry with their friends at Bournemouth, but what the Conference required in any town to which it went was simply that which a few local people could do, but what no president and no executive committee could do, obtain information about the locality, the halls accessible, and the arrangements to be made—the various little things which a host did for his friends, but those little things need not entail more than a fraction of expense. He put that plainly, and he hoped it would brush aside any misapprehension with regard to the future of the Conference, and enable the smallest village which has hotel or lodging accommodation for 200 or 500 people, because he hoped the numbers would rapidly increase, and that one thing must be considered—but any community which could entertain the British Association, which required a guarantee fund of something like £2000 and sent a number of members, varying from 1500 to 2500, into its neighbourhood for ten days, could entertain the Conference. It was a mere bagatelle. Whether it took place at the same time was a different point, and that difficulty had been solved on the present occasion. Their friends at Bournemouth would forgive him for saying that, because in the best interests of the Conference he thought it his duty to do so, but he had the greatest pleasure in supporting the motion. If he were not President at Oxford and he had the choice he should like to be President when the Conference went to Bournemouth, for through the kindness of one of the past presidents he had the opportunity of spending a few days there, and he could assure them it was a most beautiful place, and if they could only have the meeting when the rhododendrons were in bloom, they would see a sight which would make them love their native country, and renew their early affections for the beautiful scenery of England, but he had not the slightest doubt that what he saw in February, that at any time of the year it was a beautiful place, and he was perfectly sure they would be welcome there, whether the meeting was in the summer or in winter.

The motion was put and carried unanimously.

Mr. BRIDGE returned his hearty thanks for the compliment which had been paid to Bournemouth. If all the nomination slips were returned to headquarters they would have a fairly warm time, but he did not wish to prevent them doing so, because the more they were the merrier they would be. Bournemouth was big enough for them all, and great many more.

Election of Officers.

Mr. NAYLOR read the following list of officers who had been nominated by the Executive Committee:

President—N. H. Martin, Newcastle-on-Tyne.

Vice-Presidents—M. Carteighe, London; J. Laidlaw, Edinburgh; W. Hayes, Dublin; J. A. Tomlinson, Bournemouth.

Hon. Treasurer—John Moss, London.

Hon. General Secretaries—W. A. H. Naylor, London; F. Ransom, Hitchin.

Other Members of the Executive Committee—F. C. Bird, London; Peter Boa, Edinburgh; G. E. B. Bournmouth; E. H. Farr, Uckfield; J. Hodgkin, London; E. M. Holmes, London; Hy. Mathews, Oxford; W. F. Wells, Dublin; R. Wright, Bournemouth.

Auditors—C. Clayton, Oxford; F. Spinney, Bournemouth.

Local Secretary—Stewart Hardwick, Bournemouth.

The PRESIDENT said if there was no objection offered, the gentlemen named would be elected, and

was quite open to any member to challenge a ballot, or to propose another president.

No objection being offered, the above were elected unanimously.

Votes of Thanks.

Mr. GROVES moved "That the hearty thanks of the meeting be given to the governing body of Christ Church for the use of the hall for the purpose of the reception by the President of the Pharmaceutical Conference." They must have all felt what a pleasure it was to visit that noble hall, and to have an opportunity of inspecting the various portraits which adorned it. It answered their purpose admirably, and they were all pleased to spend an evening there. Their thanks were rightly due to the authorities, and he might specially refer to Canon Ince for his address of welcome, and those who kindly provided the objects of interest.

Mr. JONES seconded the motion.

The PRESIDENT, in putting it, said it was a work of entire supererogation to commend the motion to the meeting, but he must say that the warm reception given them by Canon Ince must have been very pleasurable to every one.

The resolution was carried by acclamation.

Mr. CARTWRIGHT moved "That the best thanks of the Conference be given to the Warden and Fellows of New College for the permission to hold the afternoon at home in their gardens." The observations one had to make with reference to these votes of thanks were necessarily much the same at every meeting of the Conference, but there was something special on this occasion, inasmuch as a number of their brethren had seen what he had known for a long time personally, that this great city, the heads of its colleges, and the officers associated with it and its professors, whether in medicine, science, or divinity, were sympathetic with pharmacy.

Mr. INCE had great pleasure in seconding the resolution. It was one of those subjects on which it was not necessary to enlarge, and it was useless to attempt anything like praise, the beauty of the grounds and colleges of Oxford were too obvious to need reference, but he should just like to mention for one moment the perfect way in which the music on Tuesday afternoon was rendered.

The vote was carried unanimously.

Mr. ATKINS said it was with extreme pleasure that he moved the resolution which had been placed in his hands, for whilst they had much to be thankful for, fine weather, an excellent President, a good address, and graceful hospitality, they had now specially to thank the Master and Fellows of Balliol College for the use of their hall during the visit of the Conference. That was a motion which needed nothing to commend it. They had had a warm welcome by the Master of Balliol, and they had the continued presence of the late master, whose beautiful portrait he would call attention to. He wanted them to remember that they had sat in a hall that was marvellous for its antiquity and history. As he had been sitting there the last two days his thoughts had been going back to the long, long procession of distinguished men who had belonged to that great Balliol Hall or College, which only yielded antiquity certainly to Merton, and sitting there he felt that in a certain way all the dignity and learning and grace of the past was resting upon them. At least they could do, and the most they could do, was to tender their most enthusiastic thanks to the Master and Fellows for their great hospitality.

Mr. MOSS seconded the motion very heartily, and was unanimously carried.

Mr. CROSS moved "That the cordial thanks of the meeting members of the Conference be given to the local committee, especially to the President, Mr.

Prior, the Secretary, Mr. Henry Mathews, and Mr. G. C. Druce, for the very successful manner in which they had carried out the arrangements of the Oxford meeting." The success or otherwise of the visit of a conference to a town was in exact proportion to the way in which the local committee forwarded the arrangements, and as they all felt that their Conference had been a great success in Oxford, it followed that these gentlemen had done their duty and made the best arrangements possible. It was a source of pride and satisfaction to those who came from all parts of the kingdom to feel the honour in which pharmacists were held, even at one of the chief seats of learning; that rooms like that were placed at their disposal, and men of high calibre could welcome them.

Mr. NAYLOR seconded the vote of thanks. He said he had been deputed to do so because he might, perhaps, have some little sympathy with the gentlemen who had undertaken these labours, more especially the secretarial duties. It had been his pleasure to be in constant correspondence with Mr. Mathews, not only for some few weeks, but for many months past, and he could form some idea of the magnitude of his work, and knew that he had devoted himself to it most loyally and enthusiastically. Those in London knew Mr. Druce better than Mr. Mathews, and they all had a proof of the fact that he had assisted on every available occasion, and no doubt the distinguished chairman of the local committee had also been of great help.

The PRESIDENT said he came to Oxford three months ago, when he first met the genial chairman of the committee, and spent a very pleasant hour or two in his company. He was next conducted by Mr. Mathews round the various colleges and halls to advise which would be suitable, and practically he believed the whole of Oxford would have been available if they had required it.

The motion was carried by acclamation.

Mr. PRIOR said he must disclaim any credit due for the arrangements which had been made, as he had very little to do with them after the invitation had been sent, the main part of the work being done by Mr. Mathews.

Mr. MATHEWS, on behalf of the committee, thanked the Conference for the kind manner in which they had received the resolution, and assured them that on undertaking the duties of local secretary he felt he was undertaking rather a big task, as he was a stranger to the requirements of the Conference; but he felt that Mr. Thompson, his esteemed friend, and perhaps Mr. Clayton, would assist him, and they had very greatly lessened his labours. Although other members of the craft had not been active members of the committee, he could assure the Conference they had their sympathy. Many of them were in a peculiar position, being single-handed, and unable to leave their business, but this had given him an opportunity of calling on them, and they had all with one accord given their hearty welcome, expressed their sympathy with the Conference, and the majority promised pecuniary support, should it be required. He hoped that would not be the case. He thought that meeting at Oxford had been the inauguration of a little different system, inasmuch as it was particularly requested that they should endeavour to carry out the arrangements so that the Conference should be a self-supporting institution. In the early stages of his arrangements he was somewhat grieved to hear several remarks made in different parts of the country that many friends were called upon to give subscriptions to support the Conference, and did not pay them. He felt this was wrong, but the Conference did not require it. He hoped they would be able to show that the Conference could pay its own expenses, and go where it liked, without being tied to anyone. This would

give the Conference the opportunity of visiting smaller towns and cities. Oxford was a very small place to what it had been in the habit of meeting in, and he was sure their visit would be appreciated. A fellow townsman told him that he ought to be thanked for inviting such an immense number of people to the town, as it must do a great deal of good. He thought they must do good not only to the town which they visited, but immeasurable good to themselves, as it brought the members of the craft in small towns out from the dull, miserable loneliness of their ordinary lives.

Mr. DRUCE said he told them at Nottingham that he felt very much of an impostor. That feeling had not quite left him ever since he gave them such a warm invitation. It was not received with the enthusiasm with which he gave it, but he felt still more of an impostor now, because of this vote of thanks, in which he really had no share. Circumstances over which he had no control prevented him doing any work before the meeting, but the Secretary had undertaken a very laborious work, and had carried it out in a very successful way. Since they had been there he had been trying to do what he could to make up for past neglect, and anything that he had done had been a labour of love.

The PRESIDENT wished to point out, in case something which fell from Mr. Mathews might be misunderstood, that the Conference had always been prepared to pay its own expenses; the members all paid their travelling and hotel expenses, but it was impossible to calculate such little items as printing and other things, and there must be a margin on one side or the other. At Oxford, as Mr. Mathews had told them, they had made arrangements which, it was hoped, would prevent the margin being on the wrong side. If in some places the local people had spent money, it was not the fault of the Conference at all.

Mr. RYMONDS said he had now to discharge a duty which he wished was in the hands of someone who could do greater justice to it. The Oxford meeting had been undoubtedly one of the greatest successes of the Conference. They had travelled for thirty years over the length and breadth of the land, and had received a welcome wherever they had gone, but they had never been more fortunate than they had been at that meeting. Perhaps one reason was that Oxford was not the property of one class of Englishmen, it was the property of them all. It was the first and greatest seat of learning in England. From the days of Alfred it belonged to English men and women. As they looked over the streets of the city to-day, they saw that they were determined that England should come and share it. The extension movements showed how wide the sympathy of Oxford was at present. Surely they had been extremely fortunate in meeting there. He did not wish, however, to travel over the ground occupied by previous speakers, his concern was to express on behalf of the meeting how well satisfied they were with the conduct of the President. There had been incidents which they could certainly never forget—the welcome of the Master of Balliol, the presence of Sir Henry Acland, and the cordial way in which he recognised the relation between medicine and pharmacy, and the President, on his behalf and their own, accepted that position with a dignity which was equally gratifying to them. They were very fortunate in having a President so intimately connected with those more modern branches in connection with pharmacy and medicine, so that he was eminently the right man in the right place on such an occasion. He therefore begged to move "That this meeting recognises the ability and courtesy with which the President has conducted its business, and accords to him a hearty vote of thanks."

Mr. MARTINDALE had great pleasure in seconding

the motion. They all had great respect for the President, and only regretted that he had suffered so much from loss of voice, which must have been a very great discomfort to him, but they were very grateful for the kind manner in which he had managed the meetings. They knew his character pretty well; altogether he had kept them thoroughly alive, and they had no doubt that he would have the same effect upon them at their ensuing meeting at Bournemouth.

The vote was carried by acclamation.

The PRESIDENT said if he had had a voice he did not think he could tell them how much he appreciated the honour of receiving this vote of thanks. But if in any small measure he had deserved the honour of being elected to the presidency of this important Conference last year, and the warm praise that had been given to him, it was due to the fact that in his early pharmaceutical life he had ideals, and they were contained in the names of the presidents of the Pharmaceutical Conference—he would not specify them, but those men formed his ideals in pharmacy; he had striven to emulate them. The President was absolutely a nonentity unless he was supported not only by numbers, but by important papers, and it was a remarkable thing that in one or two respects his address was almost prophetic. He said he hoped the papers might come in such numbers that a day or two might be added to the Conference, and he was not quite sure that it would not be wise to give another day to papers and discussions, some of which had had to be curtailed. He hoped next year every member would come and bring at least one friend, for there were hotels and lodging houses at Bournemouth to any extent. With regard to his re-election, as the members did not exercise their right of challenging the nomination of the Executive, he would only say that it was a very nice question with him whether he should accept the presidency for another year, and one which he found it very difficult to decide. He was a Tory by descent, in all his instincts and habits, and when he was asked to do anything he always referred to precedents, and then did as his conscience dictated. In this particular case he found that in thirty years there had been twenty presidents of the Conference, ten who held the position for two years, and ten for one, and as there was no guidance that he had to fall back on something else. Here he was guided by sentiment; the first president was his master and father in pharmacy, Henry Deane, and later, his predecessor and dear friend and elder brother, Henry Brady, so following their example he accepted the nomination of the Committee for the second time, and allowed himself, perhaps unwisely, to be elected for another year.

Mr. CARTEIGHE said that, formally or informally, some public recognition was due to the secretaries of the Conference. He was an old secretary, and knew the chief business of a secretary was to take care of his chief, to do all the work, to let him get all the acclamation, and take all the scoldings if anything went wrong. He had had the experience of both as chief as well as secretary, and thought the thanks of the Conference were due this year, as they had been for several years, to their two excellent secretaries. For the encouragement of those who wanted to take an active part in pharmacy he did not know any better training than to become one of the honorary general secretaries. It not only taught a certain amount of systematic work if you did not know it, but encouraged you in the art of speaking. He had heard Mr. Naylor that day make one of the best speeches he had ever heard at a meeting, and he could remember the time when it was very difficult to get him to open his mouth at all. He would, therefore, move, "That the best thanks of the Conference are due, and hereby tendered, to

hon. secretaries for their arduous services during the past year." Although he had not of late years attended the Conference as often as he used to, he had been a pretty regular attendant at the committee meetings, and knew the time and effort that was put into the work by both hon. secretaries.

Mr. UMSLEY had much pleasure in seconding the motion, which was put and carried unanimously.

Mr. NAYLOR said they were rather unaccustomed to anything in the nature of a vote of thanks, but it was extremely kind to remember them that day.

Mr. RANSOM also briefly acknowledged the vote, and the proceedings terminated.

Parliamentary and Labo Proceedings.

POISONING CASES AND INQUESTS.

THE USE OF INFANTS' POWDERS.

At the resumed investigation on August 22 into the circumstances attending the death of Bernard Reese (3), late of 20, Hordern Road, Whitmore Reans, Walthamston, before Mr. A. B. Smith, deputy coroner,

Mr. J. W. Scott, medical practitioner, of Milton Street, stated that he attended deceased when he was suffering from convulsive fits, probably due to teething. Shortly after ten o'clock on Monday morning he was called to see the child, but when he arrived he was dead and very blanched. The mother told him that she had given the child a powder. Witness remarked that it might have been poisoned. He had since made a post-mortem examination of the body. Death was attributable to tubercular disease of the mesenteric glands, accelerated by the administration of a powder, the elements of which were of too powerful a character to be safely administered to the child with such a disease. There was no outward sign to show that the powder was a dangerous one. He considered the powder to be a dangerous one, administered without the advice of a medical man as to the health and constitution of the child.

Arthur Enoch Palmer, laboratory manager at Messrs. Reade Brothers and Co., put in the recipe for the manufacture of the powders. Each powder was four grains in weight. The ingredients were weighed out by witness personally, and the best means known were used to ensure a proper mixing.

Charles Randall, grocer, of 83, Coleman Street, deposed to selling the powder at midday on Sunday to Mr. Reese. He purchased the powders from Messrs. Reade, and he had sold a great many of them, and he had received no complaint about them before.

Questioned by Mr. Reade, Dr. Scott said that if the child had not had the powder it would not have died on Monday. Most likely it would have died if it had not had the powder, but it might have lived for weeks or months.

Mr. Reade: I don't want it to go forth that the powders are unsuitable for children as they stand generally.

Dr. Scott: I say they are.

Mr. John Allan Lyckett, medical practitioner, was introduced by Mr. Reade, and said he thought that in some respects Dr. Scott was right, but in others he was wrong. He thought it a good aperient powder, but he agreed with Dr. Scott that it was an improper powder to give to a child suffering from tubercular disease of the mesenteric glands.

The Coroner: With regard to a generally robust child, you don't consider it dangerous?

Dr. Lyckett: From the condition of the child, no doubt it would be injurious, but the powder itself I don't consider injurious. The mistake was in treating the child without having advice. As an aperient and given to a child in robust health, it would not be an unsafe powder.

The jury recorded the verdict that deceased died from tubercular disease of the mesenteric glands, accelerated by a powder containing elements of an unsafe character, and that such powder was administered without any knowledge of its nature. No blame was attached to the mother, but caution should be taken by persons in administering to the ailments of their own children. It was dangerous to purchase and administer what might be called "patent medicines" without due advice from a medical practitioner.—*Express and Star*.

DEATH FROM ALLEGED USE OF NOXIOUS DRUGS.

At the Walthamston mortuary, on August 22, Mr. O. C. Lewis, Coroner for South Essex, resumed his inquiry into the circumstances attending the death of Mary Ann Irish, aged 33, the wife of an optical case maker, residing at 42, Gaywood Road, Walthamston, who died on Sunday, the 22nd of July last, from, it is alleged, the effects of taking noxious drugs (see ante, p. 150). Frederick Irish, the husband, stated they had been married eleven years. The deceased was taken ill by vomiting about a fortnight before her death, but he did not call in any medical man. She was treated by a Mr. Wilson, a chemist. When the deceased was taken ill she admitted to the witness that she had taken drugs to bring about a miscarriage. The witness knew that she had a miscarriage on the 11th. The deceased told the witness to go to Mr. Wilson and tell him what had happened. Mr. Wilson called and saw the deceased the same day, and came nearly every day afterwards. In reply to the Coroner, the witness said the deceased first took to her bed on the 11th. Richard Wilson, who had been acting as *locum tenens* to Mr. Andrews,* chemist, of 94, St. Mary's Road, Walthamston, said the deceased first called on him about the 10th of July. On one visit she complained of violent sickness, and the witness made her up a bottle of medicine. It contained nothing injurious. The deceased told him that she had been taking something to bring about a miscarriage.—By the Coroner: After the deceased told him that he supplied her with other drugs, but he did not supply her with the same as she had been taking. The witness further said he had called on the deceased in a friendly way, and not as a medical man. When he found the deceased was getting worse he advised her to call in a doctor or to go to the hospital. He never led either the deceased or her husband to suppose that he was a medical man. Dr. Edward Cornish, of 208, High Street, Walthamston, deposed to being called about 10.30 on the morning of July 22. He found the deceased in bed unconscious, and in a moribund condition. She died shortly afterwards. The witness had since made a post-mortem examination. He found a very large amount of intestinal inflammation. There was evidence of the deceased having recently miscarried. The cause of death was suppurative peritonitis and acute suppurative inflammation. Drugs which the deceased was said to have taken would produce this state of things. By the Coroner: Witness was of opinion that if medical aid had been called in earlier, or when the miscarriage took place, she might have recovered, and her life have been saved. The jury, after a short consultation in private, returned a verdict in accordance with the medical evidence, and added a rider that in their opinion the husband should

* This name does not appear on the Register of Chemists and Druggists for 1894 with the address mentioned.

be severely censured for not seeking medical advice for his wife before he did, and further that he was greatly to blame in not attempting to prevent her from taking those drugs. The jury further added that Mr. Wilson, the chemist, was also deserving of censure for supplying the deceased with drugs after knowing her condition. The Coroner, in censuring the husband, said that he entirely concurred with the expression of opinion by the jury that had the husband had any proper regard for his wife he would have acted differently, and probably might have saved her life. The police could now make further investigation, and if anything illegal had taken place, the Treasury could take the matter up.—*Morning Advertiser*.

Reviews and Notices of Books.

THE NATURAL HISTORY OF PLANTS. By KERNER and OLIVER. Parts 4 and 5. Pp. 337 to 448, and 449 to 560, with woodcuts and coloured plates. Each part 2s. 6d. nett. London: Blackie and Son.

With the issue of part four the first half-volume is completed. Continuing the consideration of the form and position of the transpiring leaves and branches, attention is next given to transpiration during various seasons of the year, the fall of the leaf, the connection of the structure of the vascular tissues and transpiration, and the conduction of food-gases to the places of consumption. The following section is devoted to the study of the formation of organic matter from absorbed inorganic food, and the distribution of leaves on the stem, etc., concluding with descriptions of the means by which leaves are protected against the attacks of animals.

In part five the study of metabolism and the transport of materials is introduced. Commencing with the compounds of carbon, the peculiar chemical properties of that element are first explained, with a view to showing that its nature is such as to admit of its union with other elements in inexhaustible combinations. It thus appears as the centre of all organic compounds in plants, and the materials of which the almost infinite multiplicity of these substances are formed are extremely simple, the changes undergone depending entirely upon the insertion and rejection, on the grouping and arrangement, of the atoms of a few elements. The albumins, cellulose, starch, diastase, pigments, and other cell-contents are then separately described, after which mechanisms for conveyance to and fro are considered at length. Respiration, the development of light and heat, and fermentation next receive attention, and the following section deals with the condition and mechanics of growth. The numerous phenomena included under this head are described and explained in a clear yet scientific manner that cannot fail to commend itself to all classes of readers, and the application of physical methods will throw a new light upon the subject to such botanical students as have not previously realised the close interdependence of the natural and physical sciences.

Thus, in dealing with the estimation of the heat necessary to growth, it is suggested that it should be possible to apply the mechanical theory of heat—according to which all motion can be converted into

heat, and measured as such—to the phenomena of growth. "If it were practicable to determine the quantities of heat, which might be called the 'thermal constants of vegetation,' we should be able to estimate beforehand from the heat conditions prevailing in any particular place, whether this or that plant species would thrive, whether it could produce ripe fruits, and whether or not its cultivation would be advantageous and worthy of encouragement." Some interesting results have already been obtained in this direction, with regard to the temperatures at which germination occurs in spores and seeds, and the length of time seeds must be exposed to the given temperatures in order that the embryos should increase and develop. "If a hen's egg is exposed for only two or three days to a temperature of 35° to 40°, it will not be hatched; hatching can only take place if the egg remains for twenty to twenty-one days under the influence of this constant temperature. With seeds the case is the same.... If the number of days is multiplied by the temperature, the product may be looked upon as an empirical formula for the heat necessary to the process of germination. It may be considered that this product is of regular amount, and it is regarded as a 'thermal constant.'" A table is then given, showing a selection of constants obtained from observations extending over many years in central Germany, and referring to the issue of the foliage leaves from the buds, the opening of the flowers, the ripening of fruit, and the commencement of leaf-fall. The reproach that botany is an inert science is thus shown to be gradually but surely being removed, and it may be added that the interest of the subject is also proved to immeasurably outweigh its frequently alleged dryness; this, however, being a truism of all science when studied practically and with a proper desire to solve its problems in a systematic manner.

ANATOMISCHER ATLAS DER PHARMAKOLOGIE UND NAHRUNGSMITTELKUNDE. By Dr. A. Tschirch and Dr. O. Oesterle. Parts 3 and 4. 1s. 6d. nett. London: Williams and Norgate.

A careful inspection of parts 3 and 4 of Dr. Tschirch's Anatomical Atlas will undoubtedly convince any biologist that they stand in no way inferior to the preceding parts, a notice of which has already appeared in the pages of this Journal (vol. liii., p. 599). Of special interest to English pharmacists amongst the drugs dealt with are elder flowers and fruits, clove with clove-stalks and mother-cloves, anise, fennel, Indian hemp, poppy capsules, poppy seeds and opium, coffee, sweet flag, and the leaves of various species of *Mentha*. Each of these is examined in a most exhaustive—it might almost be said too exhaustive—manner. In the article on the clove, for instance, a separate organ present in the drug, viz., receptacle, ovary, ovule, calyx, corolla, stamens, and style, is subjected first to macroscopical and then to microscopical examination. The latter is most minutely accompanied by useful hints as to the most suitable method of conducting the examination. The structure of clove-stalks and mother-cloves is described,

particular attention directed to their diagnostic characters.

Without fear of being considered hypercritical, objection might reasonably be taken to the undue and unnecessary crowding of illustrations in each plate, the number reaching in one instance no less than forty, some of which might with advantage have been omitted. By this means reference to the plate would have been facilitated, an improvement which is much to be desired, as to a microscopist accustomed to the plates of Vogl, Moeller, and others, the delicacy of the lines and faintness of the ink is somewhat trying.

The opinion expressed in the previous notice that Dr. Tschirch's atlas deserves and requires careful and critical study is confirmed by a more minute examination of parts 3 and 4. For instance, the change of colour in the clove from crimson to reddish-brown during the process of drying is referred to the formation of phlobaphene, presumably from a tannin or, at least, a "tannoid," which bodies the author endeavours to show are not present. The reasons for concluding that tannin is absent rest, however, on slender foundations. That the tannin reaction is, in many cases, open to objection, and in this particular one is inapplicable, is well known, but the use of other reagents yielding reactions with tannin distinct from those with eugenol, as for instance Gardiner's molybdate, might have been advantageously resorted to and have saved half a column of useless discussion. The method of rendering leaves transparent by chloral hydrate, with or without heat, is probably familiar to most pharmacognosts. Bearing in mind the exceeding variability of such an organ as the leaf, until sufficient evidence has been adduced to the contrary, it may well be doubted whether the form of the margin and the course of the nerves in it will prove all that the author claims. The adduction of such evidence in the atlas would, however, be as much out of place as the column and a half devoted to the development of the oil-cell in the young *Calamus* leaf. Such investigations are surely better relegated to special works, than included in general ones. The pharmacognosist has to deal essentially with the mature oil-cells; by the number of these present and the quantity of oil in them he would judge of the quality of the powdered drug, not by the amount of calcium sulphate that sulphuric acid would cause to crystallise, a reaction dependent largely upon manipulation, yielding indirect evidence only and, as the author admits, not always applicable. Such differences in observation and opinion cannot, however, be regarded in the light of defects; they rather stimulate the observer to fresh, careful, and more critical work, and will confirm in the opinion that Dr. Tschirch's atlas stands alone, and is to the student of pharmacognosy absolutely indispensable; to the teacher it is equally necessary, as it supplies him with a complete description of the anatomy of a drug, many of the details of which are new, together with a selection of illustrations on a scale that has never been previously attempted.

Novel Appliances and Apparatus.

A SAFETY INHALER.

This inhaler, manufactured by Messrs. Lynch and Co., is specially intended for use in chemical factories, drug mills, distilleries, manure works, and other places

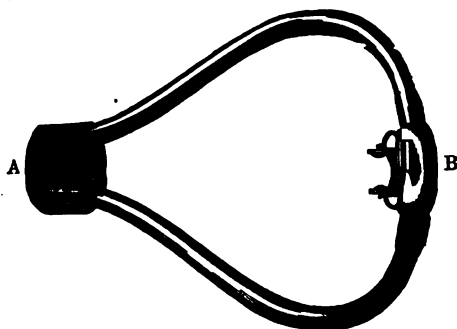


Lynch's Perfection Safety Inhaler.

where the atmosphere is noxious, being so constructed as to filter the air before passage to the lungs, and thus neutralise any danger in inhalation. It will also probably be found effectual in bronchial disorders, phthisis, etc., etc. Being made of malleable metal, it may be readily adapted to the face, and is fitted with an inflated india-rubber cushion, which renders it perfectly air-tight. By removing the cap the filtering sponge may be withdrawn and cleansed as often as desired.

THE ANTI-DIPHTHERITE.

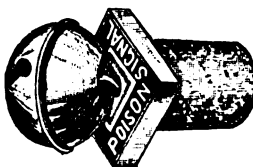
A kindred appliance, the anti-diphtherite, supplied by the Sanitas Company, Ltd., is intended as a safeguard for doctors, nurses, and other persons exposed to infection. A sponge is soaked in some disinfecting fluid and placed in the pouch A provided for its reception. The tubes are then



The Anti-Diphtherite.

passed over the head, the mouth-piece B is placed between the teeth, and the clip, which is so constructed that by adjusting the position of the studs the nostrils are securely compressed, closed. The air is thus inhaled solely from the back, and passes through a disinfecting medium of sponge. When not in actual use it hangs on the shoulders, and can be instantly adjusted when required.

POISON ALARM SIGNAL.



Orchard's Poison Alarm Signal.

This is a simple and effectual preventive of accidental poisoning which has already been referred to in the Journal. It consists of a bell attached to a cork, which tinkles when the latter is removed from the bottle, just enough to warn the nurse without disturbing the patient. The patentee of this ingenious contrivance is Mr. Edwin J. Orchard, chemist, Salisbury.

Obituary.

Notice has been received of the death of the following:—

On June 18, George Fawcitt Dodds, Chemist and Druggist, Dunedin, late of Kelso. (Aged 55.)

On August 8, Philip Young, Chemist and Druggist, Chelsea. (Aged 56.)

On August 9, Henry Nuttall, Chemist and Druggist, Leamington. (Aged 69.)

Correspondence.

INQUEST AT WOLVERHAMPTON.

Sir,—I beg to draw attention to your note headed "The Use of Teething Powders," in the Journal for September 1, from which very serious inferences may be drawn and injury done to the firm of chemists referred to.* In the first place the powder was not a teething powder at all, nor recommended for any specific ailment, but an aperient powder for children from two to three years of age, as stated on the label. Furthermore, in evidence, it was stated by Dr. Lycett, one of the most experienced physicians in the town, that the composition of the powder was good, and not in any way injurious to a child of ordinary constitution, but that any aperient medicine would have been dangerous given to a child suffering from tubercular disease of the mesenteric glands. Lastly, the dose of each ingredient was well under the official dose, and the combined ingredients only a mild dose.

F. J. GIBSON.

Local Secretary for Wolverhampton.

THE REVISION OF THE BRITISH PHARMACOPOEIA.

Sir,—The idea that ung. acid. boric. is difficult to prepare by following strictly B.P. directions does not seem to enter into Mr. Hyslop's calculations, and after the paper by Mr. Peter Boa (*vide Pharm. Journ.*, April 14 last) it does seem advisable that the B.P. directions should be modified. It seems unfair that correspondents on B.P. revision should not have read this paper, which has the merit of being at least scientific, and savours of a complete freedom from *ego*. In the ung. hyd. ox. rub. formula the suggestion that we should replace the present formula by reinstating beeswax and almond oil is absurd, inasmuch as we should still further reduce the mercuric oxide. With regard to the strictures on the relative keeping properties of paraffinum molle and lard, might I ask what is perfectly pure lard?

Clapham Park, S.W.

E. C. ANGEL.

EMPLASTRUM LYTTE, P.B.

Sir,—In reply to Mr. H. H. Mason, I would suggest that the cause of disappointment in the use of emplastrum cantharidis is most likely to be found in the indifferent way in which the "blister" has been applied. Unless instructions be given it is often carelessly put on, and is, in all probability, not in contact with the skin. The centre of the "blister" should be first applied; it should then be firmly smoothed down with the hand towards the margin—this is especially necessary if the part to which it is applied be in the least degree covered with hair. In the course of my experience I have never had a complaint of the inefficiency of this plaster. If the "blister" be spread upon adhesive plaster, that upon unglazed calico should be used, as it adapts itself more readily to an uneven surface than the stiffer glazed material. Only a narrow adhesive margin should be left to save the patient much discomfort when the plaster is removed. Probably some persons are more easily affected by counter-irritants than others, owing to difference in temperament; but this question lies outside the domain of pharmacy.

Cheltenham.

JOHN FLETCHER.

Sir,—Disappointment has been frequently experienced with regard to fresh samples of emplastrum lytte. This is the only official preparation containing cantharides in substance, and it seems to require time for complete

* See page 207 of present issue.—*Ed. Pharm. Journ.*

diffusion and absorption. A striking illustration of this was furnished some time ago by the rejection of several blisters sent out by a well-known firm, all of which were declared to be inefficacious; they had been dispensed with freshly made blister-plaster. In this dilemma, a supply of plaster which had been kept in stock was obtained from a wholesale house, with entirely satisfactory result. The sample originally condemned was found after a month's keeping to be equally serviceable, and in consequence no recently prepared emplastrum lytte was ever afterwards allowed to be used for dispensing purposes.

JOSEPH INCE.

A QUERY SUGGESTED BY MR. DRUCE'S PAPER.

Sir,—Upon reading in the Journal the report of the valuable and scholarly paper read by Mr. Druce at Oxford, the thought occurs to me of inquiring whether similar individual exists in Banbury now, as described in Drunken Barnaby's itinerary:—

"In my progress travelling northward,
Taking my farewell o' th' southward,
To Banbury came I, O prophane one!
Where I saw a Paritane one
Hanging of his cat on Monday
For killing of a mouse on Sunday."

I take it that many generations of Englishmen have ridden cock-horse to its famous cross, now, I think, no existent; and is there a child, to say naught of grown-ups who doesn't enjoy a Banbury cake?

Worthing.

J. BURN.

COCO-NUT STEARIN AS A BASIS FOR SUPPOSITORIES.

Sir,—Having through unavoidable circumstances been prevented from attending the meeting of the British Pharmaceutical Conference at Oxford to read my notes on the above subject, I shall be glad if you will permit me to reply briefly through your columns to some of the remarks made thereon, as reported in your issue of September 1. Mr. Martin seems to have somewhat misunderstood the object of the paper, and fathers me with several suggestions which apparently have their origin in his own imagination. He stated "he was sorry to see any suggestion that the basis in the B.P. should be altered." I made no such suggestion in the paper, my object in introducing the subject being simply to bring the proposed base under the notice of pharmacists as being one worthy of attention. He further remarked that "cacao butter did not become rancid, and did not change by keeping," an assertion, I venture to think, few will agree with. From his observations—that "cheapness had nothing whatever to do with pharmacy" (?), and "who would go into the fractions of decimals that would show the difference between twelve stearin suppositories and twelve made with cacao butter?"—he again evidently mistakes my meaning. They were, I presume, called forth by my statement that the coco-nut stearin base had the advantage of being cheaper, and could be made at one-third the cost of cacao butter; a fact which, I still hold, would be of material consideration in large hospitals and other institutions where large quantities of suppositories are used. I need hardly say I am fully aware that cacao butter is an ideal base for suppositories, and did not attempt to suggest otherwise. I quite concur with the comments made by Mr. Gerrard, and should assume the coco-stearin of "beautiful yellow" colour he experimented with must have been an impure variety, or else artificially coloured. I mention that a sample of the coco-stearin base was shown at the Conference meeting, which was made over two years ago, and gave no signs of rancidity until eighteen months after making.

Liverpool.

C. J. S. THOMPSON.

Answers to Correspondents, etc.

James H. Millar.—There does not appear to be any knowledge on this point available as yet.

F. Sommer.—Your best plan will be to send an advertisement of your capabilities and wants to our advertising agents, Messrs. Street Bros., who will insert it free of cost.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bennet, Kirkby, Martin, Mitchell, Ranken, Reynolds.

Pharmacy as a Profession.*

BY DR. OSCAR OLDBERG.

Dean of the Illinois College of Pharmacy.

A retail druggist who is content to carry on a purely mercantile business, trafficking in all kinds of merchandise, is not a pharmacist, and he has no right to complain if he is subject to the same inexorable competition which grinds all shopkeepers. The only part of the druggist's business which is salvable is the technical work he does. The plain truth of the matter is that a retail druggist is relieved from purely commercial competition just so far as he can demonstrate that he is a scientifically educated technical expert entitled to professional fees for his professional services, and no farther. This he can never do without being an educated pharmacist, and the more thoroughly educated he is, the better.

The assertion so often heard, that the public and the medical profession do not sufficiently appreciate the value of special education in pharmacy to discriminate in favour of the educated pharmacist, is false. There is a great amount of highly important technical work to be done in pharmacy which only the well educated pharmacist can do. Much of this expert work in pharmacy has scarcely been done at all heretofore; but it is, nevertheless, such work as will be demanded by both the physician and the public, and will be done. But it cannot be done by the uneducated. It will be the duty of pharmacists and pharmaceutical chemists who have the requisite systematic training to perform these technical and professional services, and to demonstrate their value.

The question for you is: Do you want to be a retail merchant, or a half-educated apothecary, or a well educated pharmacist? If you wish to become a pharmacist—to make the art of pharmacy with all its related technical work your life pursuit—then your duty to the community you will serve, to the profession you propose to adopt, and to yourself, requires that you should fit yourself for that calling as thoroughly as your time and means will permit. And if you are unable to acquire the education and training which are necessary to the intelligent performance of the technical work which an accomplished pharmacist is rightly expected to do, then you cannot be a pharmacist.

A fit preparation for the practice of pharmacy necessarily includes a good course of special education in an efficient school of pharmacy, and sufficient continuous experience in a well equipped and properly managed "apothecary's shop." A complete pharmaceutical education cannot be acquired in the college alone, nor in the shop alone. Both are indispensable. But the best results are not obtained by mixing them up; you will succeed far better if you give your whole time and attention to each separately.

But remember that if you cannot become an educated pharmacist, you ought not to try to become a pharmacist at all, for you will never be one. It is far better to be a good farmer, or a good blacksmith, or a good barber, than an incompetent dispenser of medicines.

The Trained Pharmacist*

The pharmacist must be fitted to decide correctly in regard to the identity, quality, and purity of medicines, to combine and dispense them accurately, and to apply for these purposes the best means which scientific training affords. He should be practised in analytical methods, quantitative as well as qualitative, and in the use of the microscope, and grounded in the scientific principles as well as in the practical operations of pharmaceutical work. He should be equally well prepared for the best professional service at the prescription table, to aid the physician as the chemist of the medical profession, to act as public analyst, especially for the protection of health, to undertake the work of the manufacturing laboratory, or for any related technical pursuit.

The demand for technical services in these branches is increasing; the properly educated pharmacist or chemist readily receives just compensation for his professional skill and services, and the only direction in which relief from the unfavourable effects of the excessive competition of the day may be found, points to increased knowledge, greater skill, and better service.

All civilized countries have laws regulating the practice of pharmacy and the sale of medicines. Such laws are not enacted for the benefit of the pharmacists, but to protect the public against the serious dangers which threaten health and life when ignorant and unskilled persons are permitted to prepare and dispense medicines. The pharmacy laws of the world are becoming more stringent as civilisation advances. Persons without a medical education are no longer permitted to practice medicine, and persons without a pharmaceutical education should not be allowed to practice pharmacy.

As the object of all pharmacy laws is the protection of the people against the evils of ignorance in an occupation which deals directly with powerful agents affecting health and life, it follows that these laws deal primarily with the enforcement of special pharmaceutical education. Experience has demonstrated that compulsory systematic special training in pharmaceutical schools, even without any subsequent public examinations, insures satisfactory results, while the voluntary system of England and America has been found insufficient. Examinations are wholesome, provided the candidates are otherwise properly prepared by systematic courses of instruction in pharmaceutical schools.

England and America are well supplied with pharmaceutical schools, and it may be safely predicted that these countries will soon follow the example of others and prohibit the practice of pharmacy by persons not educated in pharmacy. In the meantime public opinion will continue to demand higher education, greater technical skill, new duties and better service of the pharmacist; and he who is best prepared by education to satisfy this demand will enjoy the confidence of both the medical profession and the public. He who would succeed in any pursuit in this age must start upon a higher plane than that which was deemed sufficient in the past.

* Extract from an article in the *Apothecary* for August.

* Adapted from a pamphlet issued by the Northwestern University, Chicago, Ill.

The Beginnings of Chemical Study.

Chemistry is the subject which is generally considered to be the most difficult in the pharmaceutical curriculum, and rightly so, for in no other subject is a higher standard exacted in both the Minor and Major examinations. At the same time chemistry is the subject to which the pharmaceutical student is usually most attracted, and to the study of which he is prepared to devote most of his attention. This science assuredly holds the key to most of the mysteries of the art of pharmacy, and the pharmaceutical student naturally regards it as standing to him in much the same relation as that in which anatomy stands to the student of medicine.

With regard to the amount of time which should be given to the study of chemistry, it is well to recognise at the outset that the standard now reached in the Major examination is such that the would-be pharmaceutical chemist must bear it continually in mind during the three or four years of apprenticeship, if he wishes to keep abreast of the work he will be called upon to do at the close of apprenticeship in the single year of systematic study at a school of pharmacy, which is all that the majority of students feel called upon to devote to preparing for the Society's examinations. For the sake of chemistry and the other science subjects of the curriculum, not less than for the sake of pharmacy itself, it is to be hoped that the days of apprenticeship in the strict sense of the word are drawing to a close. Even the essentials of the art of pharmacy can now only be properly learnt in the shop under very exceptional conditions, and it is a matter of common knowledge that the student of to-day, who has concluded his apprenticeship and wishes to pass the Minor examination, usually finds it necessary to learn a great deal of practical pharmacy and dispensing in the school where he spends at the most but one session, and has, in addition, to make chemistry, botany, and materia medica the subjects of special and detailed study. This, however, is a large and important question, and is only touched on here in order to guard the student against the idea that he can allow the study of chemistry to stand over until the term of his apprenticeship is completed.

He should, as far as possible, try to reach the ideal state of affairs, to which we are rapidly tending, when a three years' curriculum at a school of pharmacy will almost entirely replace the present system of apprenticeship and render it possible for the student of pharmacy to study during this period not only materia medica and the art of dispensing, but also the sciences of chemistry and botany. For the present, however, it must be assumed that the student is apprenticed in the usual manner, and will have comparatively little leisure for study, until he leaves for school or college. In occupying this leisure in preparing for the systematic study of chemistry later on, it is important that he should realise that he has to deal with an experimental science, which must be studied mainly in the laboratory. If he should happen to reside in a town where there is a college or institution in which classes in chemistry are

held, he is strongly advised to attend those classes including laboratory work, and each year to learn as much of the subject as he can in this way, aided by reading and private study.

If, unfortunately, he should find himself out of the reach of classes, he cannot do better than invest in the first two volumes of the small work on 'Experimental Chemistry' which has been written by Professor Emerson Reynolds (Longmans), and perform for himself most of the experiments with the non-metallic elements which are described in the first volume. Then, if opportunity offers, most of the experimental work with the metals should be carried out, including simple qualitative analysis, from which much chemistry may be learnt if only the student will take pains to find out what chemical changes are occurring in each "test," and will make it a rule to write the simple equations which express these changes. Unless qualitative analysis is learnt in this way it had better not be learnt at all. There is no special merit in being able to "test" for the metals; it is easy for any little schoolboy to learn in the course of a few months or less, how to "find" the metals by noting the colours of precipitates.

An excellent book on elementary chemistry for general reference is Fisher's 'Class Book of Elementary Chemistry' (Clarendon Press), in which the properties of the elements and their compounds are accurately described in simple and straightforward language. The general principles of chemistry are very difficult for beginners to understand, and can only be learnt very gradually. In the majority of cases it is better to leave the attempt to master chemical theory until the last year of apprenticeship, when the student may begin to read the partly popular, but nevertheless accurate, account of the history of chemical theory which Mr. Pattison Muir has given in 'Heroes of Science, Chemists' (Society for Propagating Christian Knowledge).

Lastly, the apprentice is advised to avoid those literary productions on chemistry which are specially written and advertised for the pharmaceutical student. In many instances the erroneous ideas acquired by the student in his early days cling to him so pertinaciously that he finds it difficult to get rid of them, even after he has been taught the truth. It is important to recollect that the first and foremost thing that the pharmaceutical student has to do is to learn the general facts and principles of chemistry as a science, so that he may be able to understand their applications in pharmacy, and afterwards to apply them himself in solving the problems which daily arise in pharmaceutical practice. This is the only true meaning of pharmaceutical chemistry.

Pharmacy at the present day needs all the help she can get from the science of chemistry, and chemistry can only be properly learnt so as to be useful by study and continuous work in the properly equipped laboratory of a public institution, under the supervision of a teacher who is thoroughly conversant with the modern developments of the subject. By following the lines indicated in the present article, the student will best prepare himself for this more systematic and directed course of study, without which the education of the pharmacist cannot be complete.

First Steps in Botany.

In commencing the study of botany, the student must remember at the outset that he is about to deal with living organisms, and all the details of form and structure which they present must be considered in their bearing upon the mode of life which characterises the vegetable world. Everything that can be seen in a plant with the naked eye, or with the aid of a microscope, has some definite relation to the way it reacts to its environment, and can be explained accordingly. The first requisite for a successful student of botany is a power of careful and exact observation, and details which, to the novice, seem to have no particular purpose, are found on more extended acquaintance to play some part or other in the life of the plant on which they are found. Nor should a student be at all discouraged because the purpose of any particular part is not at once obvious. There are many mysteries about which nothing or next to nothing is yet known, but daily these grow less.

It is obvious from this that a student should not attempt to learn botany from books alone. The living organism itself should be his first object of examination. In the absence of a teacher to explain his difficulties, some book should be used side by side with the plant itself, but he must not fall into the error of thinking that even the most complete acquaintance with the book can supersede actual observation and study of the plant.

In his first studies, such a book as Oliver's 'Lessons in Elementary Botany' (Macmillan) should be the first one used. Here he will find set forth what are the principal features which plants exhibit. Armed with such a companion, he should procure some simple wild plant and learn to identify its parts. Its outward form will first engage his attention, and the peculiarities of its root, its stem, and the appendages which spring therefrom should be carefully compared with the author's descriptions till he is familiar with the several parts. Then other plants should be taken and compared carefully with the first one and with the text-book descriptions. Thus he will form a good idea of the variety which each part of the plant is capable of showing. This variety will gradually lead him up to the ideas of classification and natural relationship. The division of plants into groups and the sub-divisions of such groups can thus be grasped.

When this study of outward form and relationship has been carried on for a time, and only then, acquaintance should be made with the internal structure of the plant. It will be found that a close relationship between structure and habit of life is very easy to recognise. A water plant, or alga, whose life is spent under the surface of a stream or lake, has a very different amount of rigidity to one which lives on land, such as a herb or a tree. The sub-divisions of its body are different in the two cases, and its general consistency is not at all the same. The internal structure will be found to correspond to such differences—a tree will be hard and woody, difficult to cut or to tear, while a seaweed will be succulent, and its interior delicate and soft.

Soon a microscope will be advantageously employed, and the minute details of structure can by

its assistance be studied. Here another kind of text-book will be wanted, and no better can be placed in the hands of the student than Dr. Scott's little 'Introduction to Structural Botany' (A. and C. Black). A very simple plant, the wallflower, is the first one to be taken. It is a very common plant, and easily accessible everywhere. Again, no effort should be made to learn the contents of the book apart from the actual examination of the plant.

These two having been carefully studied, the student can turn to some more advanced text-book. By this time he will have formed a habit of working on the right lines, and can be trusted to pursue his studies more independently.

The work done so far will enable him then to take up the study of the vital processes which are carried on. The way plants absorb their food, what their food consists of, what changes are the result of such absorption, and so on, will be easily understood, and will at once illustrate and explain much of the detail already familiar to him. He will learn why the plant has assumed the form it has, and what is the meaning of the details of its anatomy.

The Principles of Pharmacognosy

The intelligent study of materia medica, or pharmacognosy as it is now more properly called, naturally presupposes a more than elementary acquaintance with the morphology and structure of plants. Without such previous knowledge it is difficult for the student to understand even the technical terms commonly used by lecturer and author in describing a drug, and quite impossible for him to have an adequate grasp of the subject he is endeavouring to study. And yet for him to possess such knowledge is the exception rather than the rule; the apprentice is frequently advised to commence his studies with materia medica; he does so by committing to memory the botanical source, natural order, and habitat of the drug, and thus acquires a certain amount of parrot-like information which, when occasion may require, he repeats in a parrot-like manner, succeeding admirably in converting a fascinating study into tedious repetition. Should the student not be in a position to avail himself of the services of a teacher of botany, he would do well to take as his guide one of the many elementary text-books, and study morphology and structure on material that he can gather from field or hedgerow, for the commonest trees, shrubs, and herbs will furnish him with abundant examples. Such works as Lindley's 'School Botany,' Oliver's 'Lessons in Elementary Botany,' Scott's 'Structural Botany,' etc., will not only render technical botanical terms intelligible and familiar to him, but will train him to observe, and to observe critically; for this reason the necessity for making the subject essentially a practical one cannot be too strongly insisted on. Nor should he content himself with simply collecting and examining leaves and flowers, as is often the case. Roots, stems, and fruits should, and as his interest grows, would be subjected to scrutiny. Much information can be gained by allowing stems and roots to dry, and observing the changes that take place. At the same time, with the aid of a text-book his knowledge of systematic botany would grow without effort, and

the student would find himself in a position to study with advantage the crude drugs derived from the vegetable kingdom. In extending his studies in this direction he would do well to classify his drugs organographically, and study the most familiar, say the leaves, first. By this means the mental strain involved in constantly transferring the attention from one to some other totally different organ would be avoided, and the powers of observation further tested. Moreover, he should preface the study of the leaves by studying in his text-book the structure of the leaf in general, and the same with the other organs.

In dealing with the vegetable drugs the aid of a text-book must be invoked. As the student reads the drug should be in one hand, his hand-lens in the other, that each statement as it is read may be verified or corrected, but he is advised to refrain from subjecting the drug to microscopical examination until he has acquired a knowledge of botanical anatomy. From the 'Medicinal Plants' of Bentley and Trimen, if available, he will gather an idea of the appearance and habit of the mother plant, whilst the 'Pharmacographia' offers him in most attractive form concise accounts of its commerce and history. Thus, and thus only, can he learn to know a drug. Let him be warned against all tables of *materia medica* that contain little more than the "name, natural order, and habitat" of the drug, and that may at most serve to "cram" for examinations in which little else is required of the candidate, but bear about the same relation to *materia medica* as a box of dry bones does to the living creature of which they once formed a part. Let him also avoid the error, too commonly committed by both student and teacher, of reducing his studies to the mere discernment of certain characters by which one drug may be distinguished from others that resemble it. The desirability of his being able to so distinguish each and every drug is undeniable, but it is only a fraction of the object of his study, and a fraction with which he will be already acquainted if his examination of each drug has been minutely and conscientiously carried out. He should at all times distinctly remember that his business is not simply to know this or that detail in any one drug, but to be familiar with at least the leading points in the history, life-history, structure, and composition of every drug.

To understand the production and collection of structureless drugs obtained from plants the student must be acquainted with the various glands, ducts, laticiferous vessels, and other tissues in which such substances as oils, oleoresins, gum-resins, etc., are secreted by the plants, as well as the changes which cellulose may undergo in the formation of such substances as gum or resin. Here, necessarily, the microscope must be requisitioned for the study of these structures, and it may be assumed that the student will have made sufficient progress in anatomical botany to enable him to make an intelligent use of the instrument; certainly he will find the study of this second section of *materia medica* amplify and explain much that he had read and observed in the first. Nor will the study of these drugs be complete without an approximate knowledge of their chemical constituents, their chief reactions, and principal physical characters.

Up to this point the student has been dealing

with drugs more or less intact; the further development of the subject will logically consist, first, in the identification of unknown, fragmentary, or powdered drugs, and, secondly, the micro-chemical detection of their active principles and determination of the tissue or tissues in which they reside, a study which is best pursued at the hand of an experienced histologist.

Pharmacy and Dispensing.

The following remarks are an attempt to answer the very difficult question, what preparation in practical pharmacy and dispensing may a student profitably make before entering upon his college course. Let it at once be stated that it is hardly possible to set too high a value upon a well-regulated apprenticeship, nay, even that the immediate gain to be reaped from a further systematic course is in direct proportion to a previous acquaintance with the various details, partly of a business character and partly chemical, which are essential to the right conduct of pharmacy.

Circumstances differ so widely that it would be unwise to lay down definite rules which should equally apply to all, but one thing is beyond doubt, that it is undesirable, generally, to let a youth acquire his first knowledge of pharmaceutical operations from the class-room and the lecture, or that his attendance at a public course should be his introduction to the art of deciphering a prescription and following out its instructions. This is to force him to read a book, ignorant even of the alphabet which forms the words.

Let the tyro carefully consider his own surroundings, and say to himself, I have chosen pharmacy for my vocation, and if I may hope to be successful and not a mere shopman, I must know about the objects and appliances in the midst of which I am placed, what they are, where they come from, and for what they are used. The most meagre establishment will furnish a selection of drugs, simple apparatus, and preparations such as are commonly met with in pharmacy; let the drugs be so persistently examined that their physical characters may become familiar, and that they may be recognised without the label's aid. Let careful examination of every description of apparatus, if only worthy of the name of drugger's sundries, come next, while preparations may follow in due time. The end of the first year should see the apprentice an adept in measuring and weighing and in the mechanical art of powdering drugs and chemicals; he should be able to make an infusion and a decoction should not be beyond his skill. At this point, Whittle's 'Pharmacy, Materia Medica and Therapeutics' (Renshaw) will prove a serviceable guide.

Unfortunate must be the position of an apprentice who has not the chance of observing manifold and sundry operations relating to his craft; if it is wise, he will from the commencement of his career devote himself to their practical manipulation, and take pleasure in so doing.

Should the task be distasteful, let him conceal his want of interest, for unless he gets to like his occupation he will make but scanty progress. Once let the desire not to be commonplace be kindled, a striving to excel will be created, and he will learn slowly but effectually the whole range

of minor pharmaceutical operations, in addition to trade requirements; while books will teach him precautions and adaptations, together with the reasons involved in official processes.

Then it should be said, mind not high things, but begin with simple solutions, with and without heat; make the syrups, omitting complex formulæ, and tinctures by maceration: let the student try to make them at a later period by percolation, which is excellent practice, requiring much observation, and is a process which can be demonstrated but imperfectly in class.

Dexterity in all these galenical branches should be acquired, for the hand quite as much as the head must be trained; manipulation studied, not neglecting cleanliness, which, if next to godliness, is on equal footing with pure pharmacy.

This second year should bring the apprentice a good step further in his career—happy for him if his surroundings offer facilities of progress, such as masters are here asked to place facilities within reach.

At this juncture an elementary knowledge of chemistry becomes essential, ignorance of that science barring further advance. It is outside the tenor of these remarks to give information respecting its acquirement—so much, at least, as is included in the science primer on 'Chemistry,' by Roscoe (Macmillan and Co.), is necessary to be understood, and this is imperative, otherwise the making of the simplest forms of chemical preparations is a thing of haphazard and rule of thumb.

The third year may be devoted to the practical application of the above suggestions to dispensing and to the direct study of the British Pharmacopœia. To begin compounding prescriptions at an earlier period is not a sensible arrangement, and may lead to dangerous consequences and some surprises, while to enter upon official pharmacy without sufficient general knowledge tends to a feeling of despair, and frequently inspires disgust. Let it, however, be firmly impressed upon the young aspirant to pharmaceutical success, and let it sink into his mind with all the force of a conviction, acted upon and sedulously carried out, that if during his last year of apprenticeship he will, with no sudden spasm of work, but day by day, master the contents of that official text-book, learn its formulæ, and by personal experiment comprehend their meaning, he will place himself in a position of immeasurable advantage. Then he may enter with confidence upon that systematic training and teaching which it is the province of a public course to offer. 'The Art of Dispensing,' published at 42, Cannon Street, E.C., gives valuable instruction in the methods and processes involved in compounding medical prescriptions.

One brief note must be added respecting Latin. A pharmacist is required to know the technical form in which a prescription is written; such knowledge should not have to be revived or scraped together at a time when a student should direct his whole attention to purely pharmaceutical matters. Unfortunately, both for the teacher and the taught, instruction in grammar rules and construction cannot as yet be banished from a lecture syllabus. Full explanation of the subject will be found in the 'Latin Grammar of Pharmacy' (Baillière, Tindall, and Cox), and the period of apprenticeship is obviously the right time when pages should be consulted.

Elementary Pharmaceutical Education in Great Britain.

Educational Facilities in London.

The School of Pharmacy conducted by the Pharmaceutical Society of Great Britain was founded in 1842, as a means of providing a sound education in the scientific principles on which the practice of pharmacy is based, and has been consistently developed during the past half century by the Council of the Society, so that it has at all times afforded a complete scientific curriculum, for the time being, for pharmaceutical students. There are now separate departments, each complete in itself, of Chemistry, Practical Chemistry, Botany, Materia Medica, and Pharmacy, and apprentices may enter for any single subject during their period of pupilage. Chemistry, including Physics in relation to Chemistry, is taught by Professor Dunstan, M.A. Oxon., F.R.S., assisted by Mr. H. A. D. Jowett, B.Sc., and there are two distinct courses of lectures (the second for advanced students) delivered during the session. Instruction in the Chemical Laboratories, which are open daily, is directed by Professor Attfield, Ph.D., F.R.S., and Mr. F. W. Short, B.Sc., and here again there are both Junior and Senior Courses. The lectures on Botany, by Professor Green, Sc.D., M.A., deal, in the first course, with the Morphology and Anatomy of Plants, including the Vascular Cryptogams, and also embraces the leading facts connected with their Physiology and mode of life. In the second course, the phenomena of reproduction are considered in detail, together with the principles of classification and the peculiarities of the chief British Natural Orders. Classes in practical work are arranged as convenient, the study of plant histology by the aid of the microscope being a prominent feature. Materia Medica and Histology are in charge of Professor Henry G. Greenish, who, in addition to lectures, conducts demonstrations in the Histological Laboratory, whilst the Theory and Practice of Pharmacy are taught by means of lectures and demonstrations by Mr. Joseph Ince. Systematic instruction in Dispensing and Practical Pharmacy is afforded in the Pharmaceutical Laboratory. Students who have passed the Major Examination are eligible for admission to the Research Laboratory where, under the direction of Professor Dunstan, they may obtain instruction in the methods of research and undertake special investigations. The Society's Library, Reading Rooms, and Museums are all available to students who are connected with the Society. Applications for prospectuses and further information respecting the school should be addressed to the Secretary, Mr. F. W. Short, 17, Bloomsbury Square, W.C. Evening classes are not conducted as yet, but doubtless were there any demand for instruction by students engaged in business during the day, it could be provided. At the same time evening courses in most of the subjects are conducted at King's College, the Birkbeck Literary and Scientific Institution, the City of London College, and in connection with numerous other institutions in and about the metropolis.

Provincial Educational Facilities.

ABERDEEN.

The Aberdeen and North of Scotland Society of Chemists and Druggists open their laboratories and museum in Bridge Street daily for practical work. Elementary Chemistry and Botany are taught at Robert Gordon's College. A class in Practical Chemistry is conducted at the Society's rooms, as well as others in Materia Medica and Pharmacy. Information concerning these classes may be obtained from the Secretary, Mr. A. Strachan, 138, Rosemount Place, Aberdeen. In connection with the Faculty of Medicine of the University of Aberdeen, classes are held in Inorganic and Organic Chemistry, Materia Medica, Botany, and Physics. The Chemical Laboratory is open daily, a Pharmacological Laboratory affords opportunities for research, there is a class for practical laboratory work in Botany twice weekly, and the Botanical and Materia Medica Museums contain extensive collections of specimens. Intending students must fill up schedules, to be obtained from the Librarian, Marischal College.

ABERYSTWTH.

At the University College of Wales, Aberystwith, Professor Snape lectures on Chemistry, and the Chemical Laboratory is open daily. Special arrangements will be made for medical or pharmaceutical students, if required, the hours for practical work being arranged to suit individual requirements. Application should be made to the Registrar.

BANGOR.

Lecture courses on Chemistry (Professor Dobbie), Physics, and Botany are conducted at the University College of North Wales, Bangor, and are recognised for medical graduation in the Universities of Edinburgh and Glasgow. There is a Chemical Laboratory also, open on five days of the week, for instruction in Chemical Analysis and in the Application of Chemistry to Medicine, etc. Particulars may be obtained of the Registrar.

BIRMINGHAM.

Students can profitably spend their first and second years at the Technical School, and the third at Mason College. At the Technical School there are Elementary and Advanced Courses in Inorganic and Organic Chemistry (Theoretical and Practical), Experimental Physics, and Botany. At Mason College the Chemical Lectures and Laboratory are under the control of Professor Percy F. Frankland, and Botany is practically and experimentally taught by Professor Hillhouse, Materia Medica and Pharmacy are in the hands of Mr. John Barclay, assisted by Mr. J. D. Whittles, and there is also a class in Chemical Physics, conducted by Professor J. H. Poynting, whilst the Herbarium, Materia Medica Museum, Pharmaceutical and Bacteriological laboratories are of great value in enabling students to acquire practical experience. Syllabuses may be obtained from the Secretaries of the respective institutions.

BRADFORD.

The Calendar of the Bradford Technical College gives particulars of Day and Evening Classes in Elementary and Advanced Inorganic Chemistry; Organic

Chemistry, Theoretical and Practical; Qualitative and Quantitative Analysis; Botany, and Organic Materia Medica. The last two are conducted by Mr. William West, and are specially adapted to the requirements of pharmaceutical students. Laboratory practice may also be had at the College, and the fees are extremely moderate. Prospectus and other information may be obtained on application to the Secretary.

BRIGHTON.

At the Municipal School of Science and Art, Brighton, there are several suitable classes for pharmaceutical students. Inorganic and Organic Chemistry are taught, both theoretically and practically, by M. Clutterbuck, B.Sc., Ph.D., whilst Physiology, Botany, and Materia Medica are also included in the syllabus, the teacher being Mr. H. Edmonds, B.Sc. The prospectus will be sent on application to the Secretary, Grand Parade, Brighton.

BRISTOL.

Evening courses are conducted at University College, Bristol, in Elementary and Advanced Chemistry, Chemical Physics, and Botany. The Botanical Garden is open to students to aid them in their studies. Day classes are held in Inorganic and Organic Chemistry, Experimental Physics, and Botany, the Chemical Laboratory is open daily, and there is also laboratory instruction in Physics and Botany. Materia Medica and Practical Pharmacy form part of the scheme of study in connection with the Faculty of Medicine of the College. Further information will be supplied by the Secretary of the College.

CAMBRIDGE.

The following classes will be held at the Technical Institute in connection with the Science and Art Department, commencing Monday, September 17:—Magnetism and Electricity (Mr. Heber Smith), Botany (Mr. A. Stubbs), Chemistry, with laboratory practice (Mr. F. Stoakley). Fee for the course for any two subjects, 5s., except Practical Chemistry, 5s. the course. It is hoped that the local pharmaceutical association will be able to arrange for its members to use the Laboratory of the Technical Institute. There are excellent Botanical Gardens belonging to the University open to the public, where a great number of the official and official plants may be seen growing.

CARDIFF.

At the University College of South Wales and Glamorgan, Cardiff, there are lectures on Inorganic and Organic Chemistry (Professor C. M. Thompson), Qualitative and Quantitative Analysis, Physics, and Botany, and the Chemical Laboratory is open daily. There are also special courses of lectures on Chemistry, Physics, Materia Medica, and Pharmacy, in connection with the Faculty of Medicine. The Registrar will furnish a copy of the syllabus on application. Evening Classes are conducted at the Borough Technical School, in Physics, Inorganic and Organic Chemistry, with laboratory practice, at merely nominal fees. Application should be made to the Secretary for details.

CHESTER.

At the Chester School of Science and Art the Chemical Laboratory has been much extended, and

classes are held in Theoretical and Practical Chemistry and Physics (Mr. J. A. McMichael, B.A.) and Botany (Mr. J. D. Siddall). Laboratory practice in Physics has also been arranged. A copy of the prospectus will be sent on application to the Clerk to the Governing Body (Mr. C. R. Enock), Grosvenor Museum, Chester. The *Materia Medica* collection of the Chester Chemists' Association is a very complete one, and together with the above classes is of great service to an annually increasing number of pharmaceutical students.

DUNDEE.

Classes in Chemistry, Botany, and Physics are held at University College, Dundee, and the laboratory instruction there provided is also suitable for pharmaceutical students. Particulars may be obtained of the College Secretary.

EDINBURGH.

Pharmaceutical students are admitted on special terms to certain of the courses of Lectures on Botany, Chemistry, and *Materia Medica*, and of practical instruction in Chemistry, recognised by the University of Edinburgh, and the Royal Colleges of Physicians and Surgeons, Edinburgh. At the Heriot-Watt College there are classes in Chemistry and Physics, with laboratory instruction in both. There are also Evening Classes in Theoretical and Practical Chemistry (Professor Gibson), Physics, and Botany (Mr. J. A. Thomson), with special arrangements for medical and pharmaceutical students in Practical Chemistry. Other classes in the same subjects may be attended at the University of Edinburgh, and special pharmaceutical classes (day and evening), in all the essential subjects, with laboratory instruction in Chemistry and Pharmacy, are conducted by Mr. William Duncan, aided by competent assistants, at the Royal Dispensary, under the control of the Board of Managers. The Pharmaceutical Society's Library, Reading Room, and Museum are at the service of all students connected with the Society. Full details may be obtained on application at the respective institutions, or of Mr. J. Rutherford Hill, Assistant Secretary to the Pharmaceutical Society, 36, York Place, Edinburgh.

GLASGOW.

Lectures are given on Chemistry (Professor Watson), Physics, Botany, and *Materia Medica* at Anderson's College, and the Chemical Laboratory is open daily. Similar arrangements exist at St. Mungo's College, where there is a well equipped Bacteriological Laboratory, and the practical work in Botany includes work with the microscope. Day and evening classes are also held at the Glasgow and West of Scotland Technical College, and special arrangements are made for pharmaceutical students in connection with the courses in Inorganic and Organic Chemistry, and Laboratory Instruction, held at the Grove Street Public School.

HOVE.

Classes in Theoretical and Practical Chemistry, in connection with the Science and Art Department, London, are conducted at Hove by Mr. H. Edmonds, B.Sc., at the Connaught Road School Laboratory. The fee for the theoretical class is 2s. 6d. per term,

and for the practical, 7s. 6d. per term, including the use of the necessary apparatus and materials. Special attention is given to pharmaceutical students. Application should be made to the Organising Secretary of the Science Classes, Connaught Road, Hove.

INVERNESS.

Arrangements are now almost complete in Inverness for providing suitable instruction for pharmaceutical students. Classes in Practical and Theoretical Chemistry, *Materia Medica*, Pharmacy, and Botany are being arranged in connection with the Burgh Technical School in Castle Wynd. A competent chemist is to conduct the classes in Pharmacy and *Materia Medica*, while the other teachers of the School will carry on the teaching of the remaining subjects. A class in Practical Physics is under consideration. It is hoped that students from the neighbouring towns of Nairn, Forres, Dingwall, Beaulieu, etc., may be able to take advantage of these classes. The Highland Railway Company is expected to afford facilities in the way of cheap tickets to those who come from a distance. In addition, the fees charged at the Burgh School are almost nominal. Any further information can be obtained from Mr. John Don, M.A., B.Sc. Lond., Science Master.

LEEDS.

In connection with the Yorkshire College, Leeds, there are Day Classes in Physics (Professor Stroud); Inorganic, Organic, and Applied Chemistry (Professor Smithells); and Elementary and Advanced Descriptive and Systematic Botany (Dr. J. H. Wilson). In addition, courses of practical work are conducted in the Physical, Chemical, and Biological Laboratories. There are also Evening Classes in Chemistry. Particulars may be obtained of the Registrar and Secretary. The Leeds School of Science and Technology, Rossington Street, Leeds, offers many advantages to students of pharmacy in the evening classes for the study of Elementary and Advanced Chemistry, Theoretical and Practical, and in Practical Physics, under the able management of the Head Master, Mr. S. J. Harris, M.Sc., with competent assistants, and also in Botany, taught by Mr. Tate, F.G.S. A prospectus may be had from the Secretary, Mechanics' Institution, Leeds.

LIVERPOOL.

At University College, Liverpool, there are day classes in Physics (Professor Oliver Lodge); Inorganic, Organic, and Physical Chemistry (Professor J. Campbell Brown); and Botany (Professor R. J. Harvey Gibson), including Morphology and Classification, Histology, Comparative Physiology, etc. Laboratories are open daily in the different subjects, as well as the Museum and Herbarium, to pharmaceutical students attending the appropriate lecture course in Chemistry, accompanied with five months' laboratory work. Evening classes are held in Physics, Chemistry (including Qualitative Analysis), and Botany. Applications should be addressed to the Registrar.

LYNN.

The new Technical School is capable of accommodating about thirty students in the Chemical Laboratory, one hundred in the Lecture Theatre, and

twenty-five in the Physical Laboratory, which is fitted for the study of Heat, Light, Sound, Electricity, Magnetism, and Mechanics. There are evening classes in all science subjects. The fees are low, and there is ample scope for pharmaceutical apprentices to gradually obtain a thoroughly efficient knowledge of subjects connected with their calling.

MANCHESTER.

In the prospectus of the Pharmaceutical Department of the Owens College, Manchester, pharmaceutical students are strongly advised to pass the Preliminary Examination in Arts before entering on the College courses, and then to attend the following lectures and practical classes:—Chemistry, Botany, *Materia Medica*, Pharmacy, and Pharmaceutical Chemistry, together with lectures on Pharmacy Law. For the advanced course, classes are arranged in Botany and *Materia Medica* (lectures and practical), and laboratory courses in Organic and Pharmaceutical Chemistry. Chemistry is taught by Professors Dixon and Perkin, Botany by Professor Weiss and Mr. Hick, *Materia Medica* by Professor Leech and Mr. Kirkby, Pharmacy and Pharmaceutical Chemistry by Mr. Hoseason, and Pharmacy Law by Mr. Kirkby. An entrance exhibition of £10 will be offered for competition in October, 1894, to students entering for the full pharmaceutical course. The subjects of the examination will be Elementary Botany and Chemistry. Candidates must give notice to the Registrar of their intention to compete on or before September 20. A scholarship of £10 and a prize of £5 will be offered at the end of the Winter Session (1894-5) for competition among students proceeding to the advanced course. The College Prospectus will be sent on application to the Registrar.

NEWCASTLE-ON-TYNE.

The North of England Pharmaceutical Association has arranged with the authorities of the Durham College of Science, Newcastle-on-Tyne, to conduct classes on similar lines to previous years, and the educational wants of pharmaceutical students are thus fully provided for. Both day and evening classes are held. Professor M. C. Potter will lecture on Botany, and there will be laboratory work on the same subject, practical instruction being given in dissection and the use of the microscope in vegetable histology. Chemistry will be dealt with by Professor P. Phillips Bedson, who will have several assistants in the laboratory to supervise the work of the students, the needs of pharmacy students being again kept prominently in mind. Mr. N. H. Martin will lecture on *Materia Medica* and Pharmacy. Though none of the fees are high, students who are connected with the local Association will be admitted to the Chemistry lectures at a reduced fee, and they will also have the use of the Library and Museum of the Association, which are now located in permanent quarters in the handsome new buildings which have recently been added to the college. In addition to the above classes, during the Easter term a course of botanical excursions in the neighbourhood has been arranged, for the small fee of five shillings. These should be largely made use of by the young pharmacists of the

district. Application for further information should be made to the Secretary of the Durham College of Science, Barras Bridge, Newcastle-on-Tyne.

NOTTINGHAM.

In order to afford facilities for obtaining special pharmaceutical education during apprenticeship, the Council of the Nottingham and Notts Chemists' Association has arranged for a three years' course of instruction, to be given at University College, Nottingham. The first year Pharmaceutical Chemistry and Physics are taught; the second year, Pharmaceutical Botany and Practical Dispensing; and the third year, *Materia Medica* and Organic Chemistry. During the coming session, arrangements have been made for a course of lectures and demonstrations in Pharmaceutical Botany, to be given by Professor Carr, M.A., and Mr. E. A. Smith. Elementary Structural and Physiological Botany, and Systematic Botany will be dealt with, and there will be practical demonstrations in the latter. The course will be fully illustrated by lantern-slides and microscopic and other preparations. Fee per term, 7s. 6d. A course of twelve class meetings in Practical Dispensing will be conducted by Mr. F. R. Sargeant. After half-an-hour's demonstration by the teacher, the students will adjourn to the chemical laboratory for practical work. Fee for the course, 7s. 6d. An examination will be held at the end of each College term, open to students who have maintained a regular attendance, and satisfied the lecturer with their work; on the result of these examinations, College certificates of merit will be awarded. Tickets may be obtained from the Honorary Secretary, Mr. William Gill, 207, Radford Road, Nottingham.

READING.

At the University Extension College, Reading, classes are conducted in Chemistry and Physics (Mr. G. J. Burch, M.A.), with laboratory instruction, and in Botany (Mr. B. J. Austin). Full particulars may be obtained from the Secretary.

SHEFFIELD.

All the classes conducted at the Sheffield School of Pharmacy, promoted and supported by the Sheffield Pharmaceutical and Chemical Society, are specially designed to advance the technical education of students in pharmacy. There are lectures on Botany and *Materia Medica* (Mr. J. Austen); Theoretical and Practical Chemistry (Mr. J. C. Platts); and there is a laboratory for practical work. The fees are low, and students are entitled to make use of the Library and Museum belonging to the Society. The Secretary of the School will answer any inquiries addressed to New Surrey Street, Sheffield. Classes in general Chemistry, Botany, and Physics are held at Firth College, Sheffield, where laboratory instruction in the various subjects may also be obtained. Particulars may be obtained of the Registrar.

SUNDERLAND.

Classes in Theoretical and Practical Inorganic Chemistry (Mr. R. Richardson, B.Sc.); Botany (Mr. Wm. Fowler, L.S.A.); Sound, Light, and Heat (Mr. J. Hindmarch); and Magnetism and Electricity (Mr. D. Woolcott, B.Sc.), are conducted under the Sunder-

land School Board, at a uniform fee of 5s. per subject, except Practical Chemistry, which is 7s. 6d. Particulars may be obtained of Mr. F. Woodward, B.A., Higher Grade School, Sunderland.

Pharmaceutical Examinations.

MINOR EXAMINATION.*

This examination is the legal test of qualification for registration under the Pharmacy Act, 1868, as a chemist and druggist. Successful candidates share the exclusive right to this title, and to dispense and sell such poisons as are scheduled under the Pharmacy Act. They are entitled also to be elected associates of the Pharmaceutical Society and present themselves for the Major examination. The requirements demanded of each candidate are that he shall be registered as having passed an approved scholastic examination, as a test of elementary education and fitness to acquire the requisite technical and scientific knowledge; he must also produce a certified declaration that for not less than three years he has been practically engaged in the translation and dispensing of prescriptions; and, finally, he must be twenty-one years old at the time of giving notice. This notice must be given and the fee (£5 5s.) paid to the Registrar—Mr. Richard Bremridge, 17, Bloomsbury Square, London—not later than the fifteenth day of the month immediately preceding that in which the examination is to be held. The subjects of examination are prescriptions, practical dispensing, pharmacy, *materia medica*, botany, chemistry and physics, practical chemistry, and the law relating to the sale of poisons. A summary of the requirements is here given—

Prescriptions.—The candidate is expected to read abbreviated Latin prescriptions in full, translate and understand them, detect errors, discover unusual doses, calculate quantities, and render English prescriptions into Latin.

Practical Dispensing.—In this subject the candidate is expected to dispense medicines from prescriptions exactly as though he were working in a pharmacy. A special factor taken into account in awarding marks is the time occupied in doing the work.

Pharmacy.—A general knowledge must be possessed of the operations of evaporation, sublimation, and desiccation, and their practical application in pharmaceutical processes. The methods and apparatus used in the disintegration of solid substances, solution, filtration, and expression, must also be familiar, as well as the principles involved in the dispensing of medicines. Finally, the candidate will be required to possess a knowledge of the proportion of active ingredient or crude material in the more potent official preparations, as well as to show a practical acquaintance with the processes by which the following official preparations are made:—collodions, confections, decoctions, dilute acids, extracts, glycerine, infusions, juices, liniments, lotions, mixtures, ointments, pill

masses, plasters, powders, solutions, spirits, suppositories, syrups, tinctures, vinegars, waters, and wines.

Materia Medica.—Crude drugs, mentioned in the British Pharmacopœia, and a few non-official ones, must be recognised at sight, and their methods of production and characteristics described. Candidates must also be familiar with the geographical sources of the drugs, their technical names, and natural orders of the plants and animals yielding them, their chief active constituents, and the official preparations into which they enter.

Botany.—A limited number of medicinal plants, mainly indigenous, must be recognised and referred to their classes and sub-classes. The internal structure of stems, leaves, and roots must be known generally, as well as the structure and contents of the cell. A practical acquaintance with the external morphology of plants is also required, together with a general knowledge of the processes of reproduction and the physiology of plants. Work with the microscope includes the recognition of stem sections, the chief varieties of vessels, and structures such as stomata, pollen, and hairs.

Chemistry and Physics.—Candidates are expected to possess an elementary knowledge of the law of the conservation of energy, the law of gravitation, the British and metric system of weights and measures, the balance, specific gravity, atmospheric pressure, the barometer, air pump, and syphon, the law of Boyle, temperature, thermometer, the law of Charles, the law of gaseous diffusion, V. Meyer's method for determining vapour densities; the chief characteristics of chemical action, the distinction of elements and compounds, the laws of chemical combination by weight and volume, the hypothesis of Avogadro, atomic weight and molecular weight, chemical formulae and nomenclature, valency, the distinction between metals and non-metals. They must also be acquainted with the general characters of the non-metals, the chief methods of preparation and the typical reactions of a number of non-metallic elements and compounds, and the usual impurities in those that are included in the British Pharmacopœia. Further requirements cover the general characters and classification of the metals, and the general methods of forming oxides and salts; the sources, the usual methods of extracting, and the chief properties of various metals, and the principal modes of preparation, properties, adulterations, and contaminations of such of them as are described in the British Pharmacopœia; the chief methods of preparing a number of carbon compounds, and a general knowledge of the methods of determining the carbon, hydrogen, oxygen, and nitrogen in organic compounds, and of obtaining molecular formulae. Candidates will be expected to solve simple problems relating to the weight and volume, under different conditions of temperature and pressure, of elements and compounds concerned in chemical reactions.

Practical Chemistry.—The syllabus includes the determination of specific gravities, familiarity with the general construction and use of the thermometer and barometer, the recognition by chemical tests of the more important non-metallic elements and com-

* A fully detailed syllabus of this examination will be found in the Calendar of the Pharmaceutical Society.

pounds, and several organic compounds, as well as to detect the chief impurities in the metals and salts included in the British Pharmacopœia, and to recognise by their physical properties those which possess well-defined characteristics. Volumetric determinations as described in the British Pharmacopœia must be performed, and candidates must be able to quantitatively determine the total alkaloids in cinchona bark, and in the tincture and extract of nux vomica, and the morphine in opium. They will further be expected to have a practical acquaintance with the methods of preparing the more important inorganic substances, including the non-metals and their compounds, and such metallic compounds as are included in the British Pharmacopœia, as well as several organic compounds.

The Law relating to the Sale of Poisons.—Candidates will be required to enumerate the poisons contained in Schedule A of the Pharmacy Act, 1868, and those since added thereto. They will be required to describe minutely the conditions required upon the sale by retail of poisons, in Parts I. and II. of Schedule A; and to write the proper entry required, according to Schedule F of the Act, for the sale of a poison coming within Part I. of Schedule A. They will also be required to state the conditions imposed on the sale of scheduled poisons by wholesale and for export; and upon the sale of a scheduled poison when forming an ingredient in a medicine dispensed. A knowledge of the conditions imposed on the sale of arsenic by the Arsenic Act will also be required.

MAJOR EXAMINATION.*

Three months after passing the Minor examination candidates may present themselves for the Major examination, upon passing which they are eligible for registration as Pharmaceutical Chemists under the Pharmacy Act, 1852. Pharmaceutical Chemists are entitled to be elected members of the Pharmaceutical Society, and are exempt in England and Wales from service on all juries and inquests, under the Juries Act, 1862. The fee is three guineas, and the examination may be oral, practical, or in writing, the subjects being botany, materia medica, chemistry, and physics.

Botany.—In addition to what is required for the Minor, the candidate is expected to possess an intimate acquaintance with the parts of the flower, fruit, and seed; to describe the structure and development of the pollen, ovule, and seed; to have an intimate knowledge of the structure and contents of cells; and a general knowledge of the origin of gums, acids, and other secretions of plants. He must be familiar with the composition of the cell wall, and the changes it undergoes. A knowledge of the general principles of classification, the system of Linnæus, and of the natural system founded upon that of De Candolle is required, as well as ability to distinguish practically a number of natural orders, and the lead-

ing genera of each; also to refer to their respective orders or genera such specimens as may be shown to him. The reproduction of cryptogams and phanerogams, and the alternation of generations are other subjects of examination, whilst the candidate must have a practical acquaintance with the use of the microscope, and by means of it be able to recognise the various tissues found in the plant, the reproductive organs of cryptogams and phanerogams, and the more important cell contents.

Materia Medica.—This comprises a practical knowledge of the methods of estimating the value of important drugs, of distinguishing commercial varieties of the same, and of separating such of their active principles as are official in the British Pharmacopœia. The candidate is also expected to have a general acquaintance with the active constituents of all important drugs, and to possess a general knowledge of the chemical properties of the official alkaloids, glucosides, resins, and essential and fixed oils. The microscope will be introduced for the examination of certain drugs.

Chemistry and Physics.—In addition to the subjects indicated by the schedule for the Minor examination, the candidate will be expected to possess a knowledge of the most important facts connected with the physical constitution of the three states of matter; liquefaction of gases, critical point; the diffusion of gases and liquids, dialysis; methods for determining vapour densities; solution, heat, light, magnetism and electricity. In chemistry he must be acquainted with the history of the atomic theory; the hypothesis of Avogadro; the methods by which the standard atomic weights have been determined; dissociation; specific volume; the periodic law; classification of carbon compounds; rational formulæ; isomerism; the characteristics and constitution of the chief typical organic compounds; the constitution, sources, methods of preparation, properties, reactions and mutual relations of several cyanogen derivatives, hydrocarbons, paraffin derivatives, and benzene derivatives; the process of alcoholic, acetic, lactic, and ammoniac fermentation; the properties and decomposition products of the principal glucosides, alkaloids, and other substances of definite chemical composition in the British Pharmacopœia.

Practical Chemistry.—The candidate will be expected to be able to analyse mixtures containing three metallic salts; to determine the nitrogen in organic compounds by the soda-lime process; to determine melting and boiling points; to perform the operations necessary for the preparation of certain organic compounds; to recognise by their chemical reactions, and to determine, where necessary, by the pharmacopœial gravimetric or volumetric methods, the strength and purity of the most important of the inorganic and organic compounds, including crude drugs and galenic preparations, described in the British Pharmacopœia; to detect and separate the most important alkaloids, alkaloid salts, and glucosides, and to separate in the pure state morphine from opium and strychnine from nux vomica.

* A fully detailed syllabus of this examination will be found in the Calendar of the Pharmaceutical Society.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, SEPTEMBER 15, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge,—17, Bloomsbury Square, London, W.C.

ADVICE TO STUDENTS.

An attempt is made in the present issue of the Journal to show students in pharmacy how they may help themselves and at the same time prepare for changes that are generally recognised, not only in this country but abroad, as both necessary and desirable. For there is little reason to doubt that the practice of pharmacy cannot long continue as formerly, and the pharmacist of the immediate future will not be able to prosper unless he possess qualifications greatly superior to those of his predecessors. Unfortunately, the statutory requirements appear insufficient to bring about generally the inevitable alterations in the existing condition of educational affairs, or to aid the development of a more perfect system, and it therefore remains for individual effort to effect what cannot at present be compelled by process of law. No hardship will be involved in this attainment of higher qualifications, so long as students understand early in their career that it is necessary, more especially since full compensation for extra effort is bound to follow.

In the first place it is eminently desirable that a much higher standard of elementary or scholastic education should obtain amongst pharmaceutical students, and with a view to being prepared for all future emergencies, they cannot do better than pass, before apprenticeship or at the earliest possible opportunity after entering thereupon, the London matriculation examination, in place of the pharmaceutical Preliminary or other examination of lower standard. The higher standard enforced in the essential subjects will be more than compensated by the greater permanency of the retention of their details, and each one of the extra subjects will be found of very great utility sooner or later.

The pharmacist as a chemist cannot afford to be ignorant of the higher mathematics, French, or German; his Latin and arithmetic ought to be above suspicion; and he ought to know his own language and be able to express his thoughts in writing much better than he usually does.

With regard to subsequent studies, full information is given in the different articles published in the present number of the Journal. It may be well to state, however, that the publication of a special "Students' Number" does not imply that students are or will be neglected at other times. Every issue of the Journal is educational in its tendencies; "Notes and Queries," "Dispensing Memoranda," and "The Month" being particularly so, and special assistance will always be freely given when asked for. At the same time, it may be suggested that students will best add to their stock of knowledge, and increase their ability to deal with difficulties, if they make a rule never to ask for assistance in their studies until they have exhausted every available means of ascertaining the facts required for themselves.

It should be needless to state that it is always desirable, if possible, that students should have the guidance of properly qualified teachers in their studies, and this applies to elementary no less than to more advanced work. Details are given in the Journal (see p. 215) regarding educational institutions throughout the country where suitable elementary instruction in scientific subjects may be obtained by pharmaceutical students, and at many other centres which are not specified the desired purpose is doubtless served equally well. No reasonable excuse, therefore, on the score of lack of opportunity in this direction is available to the majority of British students, and with a reasonable amount of diligence they should, as suggested last week, be in great measure prepared to pass the qualifying examination within a limited period of the expiration of their period of pupilage. Before proceeding to examination, however, it is always desirable that a special college course should be passed through. No attempt has been made here to deal with the institutions where such special courses are arranged, except in so far as their syllabuses include classes to which elementary students are admitted. In the course of time it will doubtless become not only desirable, but absolutely necessary, that a definite curriculum at a school of pharmacy should precede the qualifying examination. For the present, however, it will suffice to reiterate that the main point to bear in mind is that examinations should always occupy a subordinate place in any scheme of education, and preparation for them be regarded as something to be undertaken only by the way, for the worst and most unsatisfactory form of all study is that which has examinations for its sole end and aim.

THE LIQUEFACTION OF HYDROGEN.

In the Journal for January 12, 1878, a paper was published which had been communicated to the Paris Academy of Sciences, and in which M. RAOUL PICTET described experiments performed by himself and M. CAILLETET on the liquefaction of gases. Working with hydrogen, CAILLETET observed what he described as an excessively fine and subtle fog suspended through the tube used in the experiment, and this he regarded as an indication of the liquefaction of the gas. Later, PICTET communicated to M. DUMAS the information that he had succeeded in solidifying hydrogen, which was stated to have escaped from the apparatus employed in the form of a steel-blue liquid jet, and fallen in a hail of solid particles. These announcements have been accepted as statements of fact by the compilers of most modern textbooks on chemistry, but it was pointed out in the Journal at the time (vol. xxvii, p. 552) that it was obvious the work was not yet done, and subsequent experience has fully confirmed this view.

In an article in the *Times* of September 1, it is shown that the possibility of liquefying a gas depends upon reducing the temperature of its critical point, no amount of pressure sufficing for the purpose unless this condition be fulfilled. Now, hydrogen has a critical point of about -240° , and the best means so far at command—liquid air or nitrogen—only admit of a temperature some forty degrees above this point being attained. It will be necessary, therefore, to find some new substance—such as may possibly be obtained by liquefying a mixture of hydrogen with 10 per cent. of nitrogen—having a critical point of -200° , i.e., some fifty degrees lower than nitrogen itself.

Assuming that such a liquid were available, its expansion into air would produce a much lower temperature than anything that has yet been recorded. This is proved by the fact that, in Professor DEWAR'S hands, "such a mixed gas gives, under these conditions, a paste or jelly of solid nitrogen, evidently giving off hydrogen, because the gas coming off burns fiercely. Even when hydrogen containing only some 2 to 5 per cent. of air is similarly treated, the result is a white solid material (solid air) along with a clear liquid of low density, which is so exceedingly volatile that no known device for collecting it has been successful. . . . Knowing the difficulties from having to deal in the liquid state with the accumulated small impurities in such large amounts of gas, Professor DEWAR will not declare that he has had pure liquid hydrogen in one of his vacuum vessels, although what this liquid can be except hydrogen it is impossible to say. The future progress of these costly and difficult experiments must depend very much upon questions of outlay, and it is to be hoped that the public will not assume

that the endowment so handsomely given to the Royal Institution by Mr. LUDWIG MOND (*ante*, p. 4) for the maintenance of a public laboratory of research, to be called the DAVY-FARADAY Laboratory, can be used for the prosecution of such investigations."

HERMANN LUDWIG FERDINAND HELMHOLTZ.

ON Saturday last Germany lost one of her leading scientists, in the person of Professor von HELMHOLTZ, whose death occurred at Charlottenburg as the result of an attack of apoplexy. Born August 31, 1821, at Potsdam, his father was a professor in the gymnasium, while his mother was an Englishwoman. HELMHOLTZ commenced his career as an army surgeon, and prosecuted his further studies under considerable difficulties, but in 1848 he was appointed assistant in the Anatomical Museum of Berlin, and the following year he became Professor of Physiology at Königsberg. In 1858 he removed to Bonn, where he occupied the chair of Anatomy and Physiology, and three years later he was promoted to a similar position in the University of Heidelberg. Finally, in 1871 he was appointed Professor of Natural Philosophy in the University of Berlin, and this post he occupied until his death. He was the inventor of the ophthalmoscope, and was remarkable for his versatility and extraordinary fertility in scientific subjects. Equally at home in mathematics, mechanics, physics, chemistry, and physiology, he is credited in the catalogue of the Royal Society with over a hundred papers of the highest importance. The books by which he is best known are the volumes containing his popular lectures on scientific subjects, but his work on the "Conservation of Energy" is regarded as a classic, and of equal importance are those on "Physiology of Optics" and the "Sensations of Tone." The Copley medal of the Royal Society was awarded to him in 1873, and ten years later he was ennobled by the German Emperor.

JOSIAH PARSONS COOKE.

THE death of HELMHOLTZ in the Old World was shortly preceded by that of as well known a scientist in the New. Professor COOKE died at Boston, Mass., on Tuesday, the 4th inst. He had been connected with Harvard University for more than forty-four years, having been appointed Professor of Chemistry and Mineralogy there in 1850. He is said to have been the first in America to introduce laboratory instruction into the undergraduate course, and as director of the chemical laboratory at Harvard he has published several important works, including "Chemical and Physical Researches" and "The New Chemistry." In 1872 he was elected an honorary fellow of the Chemical Society, and in 1882 the degree of LL.D. was bestowed upon him by Cambridge University.

SCIENCE PROGRESS.

THE first article in the September number of *Science Progress* is one on "Snake Poison," by Professor W. HALLIBURTON, F.R.S. A complete investigation into the subject of snake poison, it is pointed out, must attempt to answer three questions—What is the poison?; what is its physiological action?; and how can one best prevent or counteract this action?—but the majority of previous workers have begun at the wrong end, three-fourths of the references consulted treating exclusively of the third question. The work of recent observers is briefly summarised, and it is shown that their researches open up fresh questions in wide and important general subjects, such as blood coagulation and the poisonous nature of certain protozoa. Mr. A. C. SEWARD, M.A., writes on "Algae as Rock-building Organisms"; Dr. BUCKMASTER contributes an interesting account of "The Biological Characters of *Bacillus Typhosus* (Eberth) and *Bacterium Coli Commune* (Escherich)"; Mr. GEORGE MURRAY treats of "Fossil Algae"; Mr. ALFRED HARKER, M.A., of "Ancient Volcanic Rocks"; and Mr. E. H. GRIFFITHS, M.A., of "The Measurement of Temperature." In an appendix is given an "enumeration of titles of chemical papers appearing in July, 1894."

PHARMACEUTICAL EDUCATION IN BIRMINGHAM.

AT the opening of the classes in connection with the Birmingham Municipal Technical School, on Wednesday, September 5, the chairman of the committee, Mr. Councillor MARTINEAU, pointed out that the classes in chemistry for pharmaceutical students, which commenced that day, represented only a preliminary step, and that the committee hoped if supported by those engaged in pharmacy to extend the teaching to other subjects. Mr. Councillor BARCLAY afterwards referred to the advantages which were offered by the school to apprentices and others, and said how important a training in chemistry was to the profession. Mr. R. D. GIBBS, President of the Midland Pharmaceutical Association, also spoke of the necessity of increased scientific education, and referred to the fact that many candidates who presented themselves for examination were very ill prepared, owing to the lack of scientific training during apprenticeship.

CHEMISTS AND THE SALE OF POISONS.

ANOTHER instance of the indifference displayed by registered chemists towards the promotion of their material interests is afforded by a case reported in the *Manchester Courier* of the 12th inst. The matter is there represented, at the Overcity Sessions, THOMAS PICKERING, chemist and druggist, Winsford, was summoned for having, on July 16, sold to JANE FINNEY, a young woman, a quantity of vermin killer, containing strychnine, without duly registering the sale, as required by the Pharmacy Act. It was stated that FINNEY died of the poison, and died the same evening. Defendant, who, of course, expressed deep regret, was fined 20s. and costs.

COMMISSION OF THE PEACE.

WE are informed that the name of Mr. R. WYNNE JAMES, chemist, Local Secretary for Dolgelly, has been placed on the Commission of the Peace for the county of Merioneth.

PHARMACY IN DEVONSHIRE.

IN the *Western Morning News* of Tuesday there is an appreciative reference to the outcome of efforts recently made in the Plymouth district to advance the interests of pharmacy by such means as lie in the power of a local association. It will be remembered that the association was successful in obtaining a grant from the Pharmaceutical Society for the purpose of obtaining a materia medica cabinet. A sum of money from the funds of the association was added to this, and as a result about three hundred excellent specimens of organic and inorganic materia medica are now arranged in a case at the room of the association. There is also a small library of chemical and botanical books, and the visitors' book is said to show that the students are using the cabinet, etc., to the fullest extent. At a special meeting held within the past week it was decided to change the name of the association to the Plymouth, Devonport, Stonehouse, and District Chemists' Association. Under the care of the first president (Mr. J. G. NETTING, Plymouth), Mr. J. COCKS, Stonehouse (hon. sec.), and many other chemists, the association has obtained a firm footing, and has now nearly one hundred members, consisting of qualified chemists, and assistants and apprentices connected with pharmacy.

ENGLISH MEDICINES IN ITALY.

A new regulation respecting imported medicines is referred to in a recently published report by the British Consul at Genoa, who observes that "hitherto there has been a considerable demand for English patent and other medicines, a variety of which have been kept in stock by the leading chemists, but I am informed that by a recent regulation, all compounded medicines sold in Italy must bear outside the package a recipe showing the ingredients of which they are composed."

APPOINTMENT AS BOROUGH ANALYST.

AT a meeting of the Luton Town Council held on Tuesday, September 4, the Sanitary Committee recommended that Mr. ARTHUR EDWARD EKINS, pharmaceutical chemist, of St. Albans, be appointed public analyst. The adoption of the report was agreed to unanimously, and the resolution ordered to be sent to the Local Government Board.

CONGRESS AT VIENNA.

AN international congress of chemistry and microscopy will be held at Vienna during the last week in September. The president of the committee of arrangements is Hofrath Dr. E. LUDWIG, and the secretary, of whom particulars may be obtained, is Dr. HANS HEGGER, I, Kolowratengasse 6, Vienna.

EXEMPTION FROM JURY SERVICE.

THE lists of persons liable to serve as jurymen for the current year are now being exhibited on the doors of all churches and chapels, where they are open to inspection. Pharmaceutical chemists whose names are included in the lists must, if they desire exemption, give notice to that effect to the local overseers during September. Otherwise they will be liable to serve on juries.

EDINBURGH PHARMACY ATHLETIC CLUB.

WE are asked to announce that the Annual Picnic of this Club will take place on Monday, September 17, to Crichton Castle. The brakes will leave St. Andrew Square at 9.30 a.m.

International Congress of Hygiene and Demography.

MEETING AT BUDAPEST.

The eighth International Congress of Hygiene and Demography was formally opened at Budapest on September 2, by the Archduke Carl Ludwig, in the name of the Emperor of Austria. The Archduke was supported by Dr. Wekerle, the Hungarian Premier, and other members of the Ministry, as well as by the Burgomaster of Budapest and other dignitaries. After an opening address by M. Hieronymi, Minister of the Interior, the Archduke declared the Congress open. He referred to the proof afforded by such assemblages of the great importance now attached to hygienic questions, and concluded by welcoming the foreign delegates. The welcome was duly acknowledged by the latter, Professor Corfield replying for Great Britain. At the close of the formal proceedings, a Court reception was held by the Archduke, at the Castle, in the evening.

The practical work of the Congress commenced on Monday, September 3, when nineteen sections assembled, and some 2000 members were present. Amongst the papers read was one by Princess Christian on the progress made in the care of the sick, and the extension of sanitary and hygienic knowledge in Great Britain. A report of an inquiry into the physical and mental condition of school children was then received from the British Committee appointed in 1891, of which Sir Douglas Galton was chairman. Miss Florence Nightingale contributed a paper on "Village Sanitation in India," and Sir William Moore one on "Tropical Dietetics." Several papers on sewage ventilation, water filtration, etc., were also contributed, while Professor Corfield dealt with "The Protection of Dwellings against Sewer Gas," and Dr. Worthington considered the systems of dwellings for small wage-earners. Mr. W. M. Acworth read a paper on "The Methods adopted in London for Dealing with Smallpox Outbreaks," and the question of epidemics was treated generally in one of the sections. An exhibition was opened during the day at the Royal Joseph Polytechnicum; a special meeting was held during the afternoon in the State Hall of the Royal Academy of Science, when Professor Huespe delivered an oration in memory of Ignatz Semmelweis; and in the evening a Court reception was held in the Royal Palace. Special performances were also given at the opera and most of the theatres.

On Tuesday, reports from various centres upon diphtheria and its treatment were received and discussed. Professor Löffler pleaded for systematic bacteriological examination in all cases of diphtheria, and said no doubt now existed as to the identity of the diphtheria bacillus. It could be present in the nose or larynx without producing symptoms of the disease, and when protected from light could survive in organic matter outside the human body for several months. Dark, damp, and dirty dwellings, therefore, favoured the preservation of the organism, and helped to spread the disease. Clean and dry dwellings, abundance of light and air, careful cleansing of the mouth and nose, and gargling of the throat with solution of salt and carbonate of soda, were recommended as prophylactic measures by the German committee. The report of the American committee was presented by Dr. Billings, and the British report by Dr. Edward Seaton, Lecturer on Public Health at St. Thomas's Hospital. A French report was also presented. Several papers on leprosy were read in the oriental section, together

with others on tropical affections of the liver, sewerage in India, the recent outbreak of bubonic plague at Hongkong, and the Ramadan. The consideration of subjects introduced on Monday was continued in certain instances, and in the afternoon the delegates witnessed the athletic sports organised by the Hungarian Athletic Club for prizes offered by the Congress.

The chief subject considered on Wednesday was cholera, its bacteriology, the conditions under which it spreads, and the measures necessary to combat it. Twenty-six papers on the subject were on the agenda, paper, by Dr. Brouardel, Professor Gruber, M. Metschnikoff, and others. M. Metschnikoff stated that the cholera microbe might be present in water long after an epidemic had ceased, and be capable of producing a fresh outbreak. At the same time its presence in the water did not necessarily involve an epidemic. Reports on diphtheria were also received, and papers were read on the methods of classifying school children as to their bodily and mental conditions, and on the provision of mortuaries and coroners' courts in London.

Thursday was a general holiday for the different sections, being devoted to excursions to various places of interest, and on Friday the discussion on cholera was resumed. A controversy on the construction of workmen's dwellings occupied the combined ninth and tenth sections, and a discussion on the opium question followed the reading of a paper by Dr. Filkin, on the geographical distribution of disease and the climatology of Africa. Professor Cayley stated that poorly fed natives in malarial districts in India were enabled to go through their daily work better by the aid of opium. Other papers dealt with the prevalence of scarlet fever in the tropics, the physical and climatic conditions of India, and contagious diseases amongst European soldiers in India, while tuberculosis constituted the chief topic for discussion by the bacteriological section. Dr. Reibmayr, of Ischl, stated that the more a population suffered from tuberculosis the less it was liable to outside contagion, and the general immunity from contagion could only be attained when all nations were equally tainted with tuberculosis poison. In the evening a reception was held by Dr. Wekerle, the Hungarian Premier.

On Saturday, a paper on cholera was read by Dr. Ernest Hart, in which he reiterated the views that he has already published on the question. Papers criticising the germ theory and treating of the source of malaria were afterwards considered. In the afternoon a plenary sitting of the Congress was held in the Town Hall, to receive and consider the resolutions formulated by the sections. Some confusion arose with respect to these owing to some of the recommendations being neither printed nor translated, whilst one attended to explain or defend others. Dr. Billings protested against the wholesale adoption of imperfectly understood and unexplained resolutions, and urged that an international congress should only pass resolutions which were universally agreed upon. The voting proceeded, however, although of the 200 members whose names were inscribed on the roll the Congress a very small proportion was present, not as twenty remaining towards the close of the proceedings. A resolution in favour of entrusting pharmacists who had acquired the necessary qualifications with the analysis of articles of food was rejected, Professor Corfield stating that nobody who understood the delicate and delicate nature of this duty would entrust it to dispensing chemists. Amongst the resolutions adopted was one in reference to Miss Florence Nightingale's paper on sanitation in India, and calling on the governments to devote more attention to the condition of workmen engaged in industries, a third in favour of the extension of hygienic teaching to schools of all grades, also

appointing a committee to consider the best conditions and methods of constructing workmen's dwellings, and one in favour of the reduction of taxation on light beer and of increased taxation on spirits. In the afternoon many members of the Congress witnessed a grand parade and drill of the city and provincial fire brigades in the courtyard of the artillery barracks. Others attended the races organised by the Hungarian Cyclist Society in exemplification of the hygienic advantages of outdoor physical exercise. In the evening the delegates were entertained by the Municipality of Budapest in the Great Industrial Hall.

The Congress was formally brought to a close at a general meeting in the municipal redoute on Sunday. M. Hieronymi, Hungarian Minister of the Interior, presided, and all the official representatives of foreign governments were on the platform. The usual official reports regarding the work of the Congress were presented, and the permanent committee was re-appointed, the name of Dr. Poore, of London, being added in recognition of his work as secretary-general of the London Congress of 1891. It was resolved to hold the next Congress at Madrid. M. Gimenez, in the name of the Spanish government, expressed his pleasure at this decision, and assured the Congress of a warm welcome. Professor Corfield read the following letter from the secretary of the Prince of Wales, explaining that it should have been read at the opening of the meeting, but had not been received in time:—

"Dear Sir Douglas Galton,—I have submitted your letter and enclosures to the Prince of Wales. His Royal Highness would be glad if, in your reply at the Congress, you would allude to the interest which he takes in hygiene and demography, and to the fact that he was president of a similar Congress in 1891. Perhaps you would also express his gratification at hearing that the Emperor has allowed his name to be connected with a gathering called together to discuss such important questions. Yours very truly,

"FRANCIS KNOLLYS."

The official delegates of other countries having returned thanks for the hospitality extended to them during their visit to Budapest, M. Hieronymi delivered the closing address, referring to the great importance of the discussions which had taken place, especially those relating to cholera and diphtheria. The Congress then dispersed, large parties leaving in the course of the day on excursions to Belgrade, Constantinople, and other places.

Provincial Transactions.

PLYMOUTH DISTRICT CHEMISTS' ASSOCIATION.

The Plymouth, Devonport, Stonehouse, and District Chemists' Association held a special meeting at the Foresters' Hall, Union Street, Plymouth, on September 5. Among those present were Messrs. J. G. Netting, President (in the chair) R. H. Rendle, C.C., and F. W. Hunt, Vice-Presidents; F. Maitland, W. Condy U'Ren, A. D. Breeze, J. Barge, Barber, R. F. Roper, J. H. Bailey, Hon. Treasurer, and James Cocks, Hon. Secretary. Several motions were brought forward, in connection with the rules and bye-laws, for the annual meeting, to be held on October 10 next, and the first annual dinner on that day; also for the election of officers for the ensuing year. A full discussion on the motions brought forward by Messrs. J. Cocks, J. G. Netting, R. F. Roper, R. H. Rendle, and W. Condy U'Ren was taken part in by all members present. The new materia medica cabinet, just erected in the room, was greatly admired, and gave general satisfaction. A vote of thanks to the chairman, proposed by Mr. R. F. Roper, and seconded by Mr. F. W. Hunt, was unanimously carried.

SUNDERLAND CHEMISTS' ASSOCIATION.

A social evening of the above Association was held at the Fawcett Street Café on Thursday, September 6. The following members and friends had gathered together at the appointed time:—Messrs. Jno. Harrison, President; Jno. Mitchinson, Vice-President; W. W. Leadbitter, Treasurer; R. H. Bell, Secretary; C. Ranken, T. Walton, M. J. Todd, C. Hodgson, A. D. Purse, J. R. Askew, A. B. Porter, H. B. Watkins, A. Golightly, T. B. Harrison, R. Robinson, E. R. Cherratt, J. H. Bell, A. O. Bell and J. W. Morean.

The President opened the proceedings by presenting Mr. R. Robinson, on behalf of the Association, with a beautiful pair of gold spectacles, as a token of esteem and recognition of his services as Treasurer for the past twenty-four years. Mr. Robinson feelingly replied, and reviewed the work and the ups and downs, etc., the Association had gone through since he had first joined it.

The remainder of the evening was occupied by a description of a trip to the Chicago Exhibition, Messrs. Ranken and Walton officiating at the lantern, after which music, etc., was indulged in. Votes of thanks to the President and those who had taken part in the entertainment were passed, and the company then dispersed.

American Pharmaceutical Association.

CAN A MINIMUM STANDARD OF PHARMACEUTICAL EDUCATION BE ADOPTED?*

BY OSCAR OLDBERG, PHARM.D.

More or less definite compulsory courses of pharmaceutical education are established in most of the civilised countries of the world. England and the United States are the notable exceptions. The chief reason why pharmaceutical education has not been made compulsory through the enactment of direct special laws in England and America is evidently to be found in the fact that in these two countries there is unlimited competition in the retail drug business, while in the other countries the competition is limited. Nevertheless, England and America have sought to accomplish at least something in the same direction by indirect means. Instead of declaring that every person who is granted a licence to practise pharmacy must first have completed a certain course of studies in a pharmaceutical school, the pharmacy laws of England and America simply require that the applicant for such licence shall pass an examination conducted by the official pharmaceutical examiners representing the State.

But compulsory pharmaceutical college training has recently been established even in Ontario and Quebec, Canada, and in Victoria and Queensland, Australia, in which countries the retail drug business is carried on in the same way as in America. Therefore, it ought to be practicable to adopt compulsory standards of pharmaceutical college training in this country too. This can, of course, be done only by legislation. That such legislation will surely be undertaken, sooner or later, we may know from the steady progress of pharmaceutical legislation in all lands. We can hope for wise laws if the whole subject in all its bearings be carefully considered by competent, conservative, broad-minded men, uninfluenced by personal prejudices, and a definite plan agreed upon by them to serve as a basis for these laws. I, for one, feel hopeful that this can be accomplished.

Before any laws shall be enacted to establish compulsory pharmaceutical education, it would seem to

* Read at Asheville, North Carolina, on September 6.

be highly desirable that a body of thoroughly representative men should give this question their most deliberate and earnest consideration, and formulate an authoritative declaration as to what should constitute a minimum course of pharmaceutical education, or, if these men should conclude that more than one class of pharmacists ought to be recognised, each with its own standard of minimum requirements as to education, then these respective standards should be formulated.

This body might consist of delegates or members elected or appointed by the American Pharmaceutical Association, the Boards of Pharmacy of the respective States, and the several pharmaceutical schools or colleges. Ample sufficient time should be taken to give due attention and thought to the question. If one year is not found sufficient, let two years be devoted to it.

It should be the duty of that body not to attempt simply to equalise or harmonise the different standards or courses now given in existing pharmaceutical schools and colleges, nor to effect any compromises between them. A body or commission constituted in any such manner as here suggested could have no power to compel any college or school to adopt its conclusions any more than this Association could establish uniformity in the methods and educational standards of the several colleges. On the contrary, the commission, should one be constituted, must, in order that its conclusions may command respect, avoid being unduly influenced by the methods or standards of any of the existing schools. It should, instead, think out and formulate, *ab initio*, such a plan and such standards as may seem to a majority of its members to be wise and practicable, and to best subserve the interests of the people, the medical profession, and true pharmacy, wholly regardless of the present or prospective practices, plans, or interests of any teaching pharmaceutical institution or institutions, and without any thought of trying to coerce any such institution into any degree of conformity to the conclusions which the commission may reach.

The conclusions formulated by the commission may not closely resemble the requirements or practice of any one of the existing pharmaceutical schools. Indeed, the differences between different institutions are so considerable that the independent views of the commission would probably not conform to those of any one of them. But if the conclusions of such a commission bear evidence of intelligent fidelity to the true interests and dignity of pharmacy, if they have the stamp of wisdom, justice, and independent thought, and if they be practical, their moral weight will accomplish more for the recognition, spread, and further advancement of sound pharmaceutical education than any compromise or rivalry between the colleges, or any vote or resolution passed by any association.

No standard of pharmaceutical education can be of any value unless sufficiently well defined to ensure a reasonably close approach to uniformity of interpretation. Nevertheless, any unnecessary details should be avoided in its formulation.

Upon the invitation of the officers of this Section on Education and Legislation I submit herewith some facts and questions which seem to me to require very careful consideration in this connection:—

1. What should be the minimum of preliminary education required of all who shall enter upon their apprenticeship in pharmacy, or who shall be admitted to a college or school of pharmacy?

2. Should there be but one class of college trained pharmacists, and if so, what should be the minimum of special education required? If more than one class of college-educated pharmacists be deemed necessary,

what should be the minimum course of special education of each class?

3. Should not the minimum standards recommended be such as can be made compulsory by law in the near future?

4. What courses of study ought to be included in the obligatory curriculum, and how wide should be the field of study in each distinct subject?

The answer to this question must, of course, depend upon:—(a) the number of months devoted to the entire course of education; (b) the number of hours' instruction and text-book study from day to day; (c) the preparatory education demanded of the students; (d) whether the course is intended to be eventually made obligatory upon every pharmacist, or only upon those who voluntarily attend colleges of pharmacy; (e) whether the students devote their whole time to their school work, or divide time between the college and the shop; and (f) what is practicable in view of the actual condition of the practice of pharmacy, and those engaged in it.

5. How many months or weeks should be devoted to the entire course of special college education?

The answer to this question must necessarily be governed by the very important circumstance whether or not the student gives his whole time and attention to his studies, and is well occupied; and if the student's time is divided between his studies and everyday shop employment, then the question must be: what proportion of his time is really devoted to his school work?

A "three years' course" with but five months' work each year would be a very different thing from a "three years' course" with nine months' work each year; six months' work with the student's entire time and attention devoted to his studies is a very different thing from six months divided between study and wage-earning; ten hours' instruction weekly for a month is not to be compared to thirty hours' instruction weekly of the same kind during the same length of time; and a course consisting of lectures only is entirely different from a course including also laboratory practice.

It is, therefore, self-evident that the value of a course of education is not to be measured by the number of calendar months through which it extends; but that many other and much more important conditions must be considered in connection with it.

6. Should not the students be required to devote their whole time and attention to their studies, to the exclusion of drug store employment or any other outside occupation during the entire college course? If not, how much longer should the college course be continued in order to offset the time lost by simultaneous wage-working?

7. What should be the minimum amount of obligatory school attendance weekly during the whole course?

In the pharmaceutical schools or colleges the actual practice varies considerably; the instruction occupies 6, 10, 12, 15, 19, 30, and 40 hours weekly.

8. What should be the minimum amount of obligatory laboratory practice in chemistry, pharmacy, and pharmacognosy, respectively?

In actual practice the total obligatory laboratory work varies in different colleges from zero to over twenty hours weekly.

Can any valuable laboratory course in chemistry be accomplished in less than 200 actual working hours? And would it be too much to expect 300 hours' actual laboratory practice in chemistry, and the same number of hours in pharmacy as the minimum?

And, finally, if a "standard" is adopted, should it be the most complete and thorough course of pharmaceutical education practicable, without regard to time and expense, or should it be the best course the average

pharmacist might be able and willing to accomplish?

The pharmacy laws of Ontario, Quebec, Victoria, and Queensland are, perhaps, not explicit enough, but the colleges of pharmacy in those provinces have courses occupying six or more months. The School of Pharmacy of the Pharmaceutical Society of Great Britain at London gives a course of ten months, with the student's whole time devoted to his school work. Can a longer course be adopted as a minimum in America? If so, let us adopt a longer one.

In actual practice the American pharmaceutical schools or colleges give courses ranging from forty weeks to four years, if we are to compare them by the calendar time occupied. We have courses of 40, 42, 44, 46, 50, 52, 60, 76, 114, and 152 weeks net time respectively. At least seven pharmaceutical schools now offer courses occupying two years, with nine months' full work in each year.

It is highly gratifying that ambitious and eager students of pharmacy in our country can now take solid thorough courses extending over two, or even three or four years of full work. But, while these schools are of great value and importance, and must exert considerable influence upon the further improvement and spread of pharmaceutical education, it is certainly equally true that those colleges of pharmacy which are striving to give as extended a course as a considerable number of students can be induced to take under existing conditions, are entitled to equal respect and support, and are performing an even more important use. Who shall answer which is the more important, the school for the thousands, the school for the hundreds, or the school for the tens?

Although there are at least 130,000 persons employed in the retail drug business in our country, and more than one-half of these are compounding medicines on physicians' prescriptions, probably only about 10,000 of them are graduates in pharmacy, less than 3700 annually attend any pharmaceutical school, less than 900 annually finish their college courses, less than 300 annually attend colleges in which the minimum of time required for the completion of the course is at least two terms of nine months each, and less than 100 of these have got beyond their first nine months' work. Nearly three-fourths of all the pharmaceutical students in the United States drop out after the "junior course;" in other words, they devote only from twenty to thirty weeks of their life-time to the special studies intended to prepare them for their life pursuit. Nearly nine-tenths of the persons who become registered pharmacists and assistant pharmacists never attend any college of pharmacy.

We may well ask, then, how shall a greater number of the persons employed in pharmaceutical work in our country be induced to attend the colleges of pharmacy, and how shall all who hereafter seek registration and licence to conduct drug stores in which all kinds of technical pharmaceutical work is done, be induced to acquire the special education requisite for that work? For the accomplishment of these ends I do not believe that any substantial progress can be made by attempting to establish but one standard course of pharmaceutical education, or by a rivalry among the schools to give the longest course. If the apparent tendency continues, we shall have, perhaps, courses of pharmaceutical education extending over five or six years, before long. What we should try to do, it seems to me, is to gradually elevate the whole body of pharmaceutical workers to a somewhat higher plane, educationally, than they now occupy, and a portion of them still higher than the rest. In other words, let the question of three or four years' courses take care of itself. Let us go down a little nearer to the level of the average education of the pharmacists of the day and bring them up to as high a standard of

special education as seems practicable, and let us be careful not to attempt to do at once that which it will certainly require many more years to accomplish. Let us not make the grave mistake of adopting a minimum standard of special college training in pharmacy so high as to be beyond the reach of the majority of the rising generation of clerks and apprentices. Instead, let there be two standards.

It seems to me that each college of pharmacy might give two different degrees—one representing, perhaps, one full year's work substantially as in the School of Pharmacy of the Pharmaceutical Society of Great Britain, and another representing an additional year's full work.

It is useless to ignore the fact that a large majority of all students are greatly influenced by their ambition to secure a degree and a diploma as evidence of their work. Is there any valid objection to the adoption and general recognition of two different courses and degrees—one course intended for the great majority of students and to be eventually made the obligatory minimum course for assistant pharmacists, and a higher or longer course with a higher degree intended to be eventually made obligatory for managers of pharmacies of the higher class?

If an able commission should formulate practicable minimum standards I venture to predict that every school of pharmacy in the country would at once and cheerfully do more than these standards require.

No school need feel called upon to give more than one fixed course or degree, be it the lower or the higher of the two. Any school would still feel free to make its courses as much higher than the minimum standards as it may deem best; and there would be nothing to hinder any school from adopting a course two or three or ten times as extended as the highest standard recommended by the commission. There would always be plenty of room at the top; what we most need is a limit at the bottom.

The successful issue of such a movement as this would bring with it another result. It would necessarily help to minimise the jealousies and rivalries which exist between the several institutions—"a consummation devoutly to be wished."

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

THE USE OF INFANTS' POWDERS.

At the Shoreditch Tabernacle, on September 29, Dr. Wynn Westcott, coroner for north-east London, held an inquiry into the circumstances attending the death of Agnes James, aged one year and eight months, the daughter of a postman. The mother deposed that on Friday last, as the child was feverish, she sent a little girl to "Dr. Williams's shop" for a 1½d. Steadman's teething powder. The girl returned with a pink powder and told witness that she had asked for a 1½d. powder for a baby eighteen months old. The powder was given to the baby. About two hours later the child was seized with a convulsive fit. Dr. Irvine prescribed for it, but death ensued next morning. Minnie Hardy, the wife of a herbalist, of Hoxton Street, stated that she supplied the powder. The Coroner told her that, as there was a possibility of a criminal charge being preferred against her, it was his duty to caution her. She hesitated about giving evidence, so the testimony of Dr. Irvine was taken first. He said that death was due to convulsions produced by the calomel contained in the powder. A juror remarked that the instructions on the packet produced said that only half a packet was to be given to a child

under three years of age. The mother had given the whole of the powder. Mrs. James explained that she could not read. Mrs. Hardy said that she felt in a very awkward position. The Coroner said that in the circumstances he should advise her to tell all she knew. She then stated that on Friday afternoon she was asked by a little girl for a "13d. powder," and gave her one similar to that produced, labelled "Dr. Williams's Child's Blessing." There were full instructions on the packet, and the powders were made from a prescription of her father's. He had been dead several years. His name was Morgan Edward Williams, and he was a chemist. The Coroner remarked that Mr. Williams's name was still on the chemists' register, and that it ought to be removed. Harry Hardy, husband of the last witness, stated that he was not practising as a chemist. His premises were called "Williams's Drug Stores." He at first denied that the name "Dr. Williams" was on the premises at all, but he admitted at last that it did appear on the lamp outside the shop. Eventually the jury returned a verdict in accordance with the medical evidence, and recommended that in future such powders should not be sold to young children.—*Times*.

DEATH FROM AN OVERDOSE OF CHLORAL.

The Leeds City coroner (Mr. J. C. Malcolm) held an inquest at the Leeds Town Hall on September 4, on the body of Arthur Fryer, aged 52 years, commercial traveller, of Portinscale Lodge, Higher Broughton, who had died at the Albion Hotel, Briggate, Leeds. According to the evidence the deceased was found dead, and on the dressing-table was a bottle about half full of chloral. Death was due to a dose of that drug. Dr. Greville, a medical man resident at Douglas, in the Isle of Man, where deceased was formerly resident, said he was personally acquainted with that gentleman. He had known that he was a sufferer from dyspepsia and insomnia, and hearing that he had become addicted to taking chloral, warned him against the habit. He was certainly of opinion that death was due to an accidental overdose. Deceased was a man of a most cheerful disposition, and was not likely to have committed suicide. A verdict of "Death from misadventure" was returned.—*Yorkshire Evening Post*.

DEATH FROM OVERDOSE OF OPIUM.

An inquest was held at Heathfield Holt, on Tuesday, August 28, by Mr. E. Bedford, touching the death of Mrs. Susan Glover, aged 62 years, widow of Mr. Robert R. Glover. The medical evidence was to the effect that death was probably caused by deceased having taken an overdose of opium, and the jury returned a verdict of "Death from misadventure."—*Sussex News*.

DEATH FROM OVERDOSE OF LAUDANUM.

On September 7 Mr. Henry Dean held an inquest touching the death of Charles Garton, 48, labourer, of Castle Donington, who was found dead in bed the previous morning. Evidence was given to show that deceased had been in the habit of taking laudanum, and Dr. Fletcher said he was called to see deceased about 8.30 on Thursday morning, and found him dead in bed, undressed. Death apparently had taken place some hours previously. There were no marks of violence. He examined the pupils of the eyes and found them dilated. The face seemed to be drawn rather to the right side, and congested on the side. Witness had an idea that deceased suffered from apoplexy, but since hearing the evidence he was of opinion that death was due to an overdose of laudanum. Three drachms would kill a man not in the habit of taking it. The jury returned a verdict that deceased died from the effects of an overdose of laudanum

taken by himself with the intention of securing sleep and rest, and not with the intention of committing suicide.—*Leicester Daily Post*.

DEATH FROM OVERDOSE OF CHLORODYNE.

Mr. Bush held an inquest on Saturday, August 25, at 8, Clarence Square, Brighton, touching the death of Edward Croft Sykes, a retired surgeon, late of 4, Wellington Circus, Nottingham, who died early on the previous morning at 8, Clarence Square. The evidence went to show that the deceased, who was 64 years of age, and was staying with his sister in Clarence Square for the benefit of his health, had been in the habit of taking chlorodyne. Mr. F. Sloman, surgeon, was sent for on Wednesday and found him unconscious. He applied remedies, but deceased gradually sank, and died early on Friday morning. Mr. Sloman had made a post mortem examination, and considered that death was due to an overdose of chlorodyne. The jury returned as their verdict that the deceased died from the effects of an overdose of chlorodyne taken by misadventure.—*Brighton Observer*.

POISONING BY LAUDANUM.

A curious case of mixing laudanum with a baby's food came up at the Islington Coroner's Court on September 4. Amy Raymond, of Hemingford Road, Barnsbury, said that the deceased child had lately suffered from dentition and was very restless, depriving her of sleep at nights. She was in the habit of taking doses of laudanum herself, and on the Friday night, when baby was very cross and restless, she happened to have sixpennyworth of laudanum in a bottle. It occurred to her that a "few drops" in the baby's milk might have the effect of sending it to sleep. Hence she poured a "very little" of the laudanum into the jug containing the milk, and then divided the liquid into two lots. The first lot was used for the baby's bottle on Friday night. Notwithstanding the drug the child continued sleepless and restless during the night. The next morning, forgetting all about the tincture of opium, she administered the second lot of baby's food. Then the child became alarmingly ill and died on the Sunday.

The doctor's conviction was that the mother acted in ignorance and without any other design than to make the child sleep and do it good.

The jury, in returning a verdict of "Death from misadventure," blamed the mother of the child for her thoughtlessness and carelessness, the coroner remarking that it was not requisite to have a medical knowledge in order to realise that laudanum, dangerous to adults, must be infinitely more so to children.—*Morning Leader*.

Notes and Queries.

SOFTENING HARD EXTRACTS.

[768.] I have found that a mixture of glycerin and water in equal parts, such as is often kept on the dispensing counter for convenience, answers admirably for softening hard, watery extracts such as belladonna, previous to incorporating them with fats for suppositories or ointments. Glycerin alone, as your correspondent suggests, does not answer well, which is probably due to its hygroscopic nature as much as to its slippery character in the mortar or on the pill-slab. For resinous extracts such as cannabis indica, spirit would seem to be the natural thing to use for softening, and experience quite bears out that conclusion.

E. F. YOUNG.

PHOSPHORUS PILLS.

[769.] Method No. 3 is one which makes good pills, and is easy to manipulate. Many dispensers pour a few drops of chloroform or spirit of chloroform upon the mass whilst making, to prevent oxidation.

E. F. YOUNG.

PREPARATION FOR CAVITIES IN THE FACE.

[772.] I have been requested by an ear and nose specialist to make up for him some neutral preparation that he can use as a basis for filling up cavities in the face. He desires something that will be capable of use with an ointment syringe, and yet solidify enough not to run out after insertion. Gelatin has been found unsuitable, and the best result has been obtained with a mixture of glycerin and starch. This does not quite answer the conditions, however. Briefly, what is required is a substance, waxy or otherwise, fluid enough at a bearable temperature to inject, yet that will form a soft mass at the temperature of the blood and could be washed out, when required, with warm water.

ARTHUR MCKELLAR.

DIGESTIBLE MILK.

[773.] The difficulty sometimes experienced by invalids in taking and assimilating milk is well-known, but is said to be surmounted by the following process—devised by Dr. Robert T. Edes, of Boston—for making the fluid palatable and digestible. A pint of milk is gently warmed, and whilst it is constantly stirred twenty minims of dilute hydrochloric acid is dropped into it very slowly. If the milk is stirred until cool, a very fine flocculent coagulum is produced, which floats in the whey and is easily accessible to the digestive secretions, while the whole fluid has lost to a great extent the taste which renders it unacceptable. Special advantages of the method are that the casein is retained and used, and the milk is not bitter as when pancreatised (*New York Medical Record*).

Dispensing Memoranda.

[652].—Herewith I send you three prescriptions which may be of interest. The first is a German prescription, and as the name for cold cream (ungt. leniens, *vide* U.S. Dispensatory) was new to me, it may be of interest to others.

R. Hydrarg. oxyd. rubr.	0.15
Ungt. lenient	2.0
Lanolin	8.0

The ointment for the eyelids.

The second, prepared in a porcelain basin in the order given, with the aid of a pestle, gives a good result, but if the stirring be overdone, the water begins to separate out.

R. Plumbi. oxid.	3v.
Ac. acetic. dil.	3iv.
Coque simul. ad.	3xiii.

Addo Lanolin
Ol. olive

Ammon. sulph. Ichthyol 3v.

In the third, if the styrax be first rubbed down with spirit (*vide* ungt. styracis, Martindale), there is no difficulty, but I wondered if the physician had in view the

formation of sulphurated lime. This I should not expect on heating, while carbonic acid itself tends to decompose such sulphides with formation of carbonate.

R. Styraois præp	3ss.
Ungt. sulph.	3i.
Cretæ præp	3ii.
Vaselin	3iii.

JAMES GRIMR.

Obituary.

EDWARD HORNER.

The death of Mr. Edward Horner, formerly of the firm of Horner and Sons, occurred on September 1, at Crayford, Kent. Mr. Horner, who was in his eighty-first year, was one of the founders of the Pharmaceutical Society, and as such responded to a toast at the Jubilee dinner of the Society in 1891. He was also a Justice of the Peace and a member of the Salters' Company.

Notice has also been received of the death of the following:—

On August 10, John Henry Negus, Pharmaceutical Chemist, Northampton. (Aged 28.)

On August 14, James Dunsmore, Chemist and Druggist, Garliestown. (Aged 82.)

On September 6, Emanuel Hutton, Chemist and Druggist, Leeds. (Aged 66.)

On September 6, Atkinson Pickering, Pharmaceutical Chemist, Hull. (Aged 74.)

Patent Office Business.

APPLICATIONS FOR PATENTS.

No. 15,525.—August 15, 1894.—John Wallace, 34, Highfield Road, Rathgar, Dublin, for a cure for influenza.
No. 16,711.—September 1, 1894.—Jane Darby Lucy, 32, Queen's Terrace, St. John's Wood Road, N.W., for a new or improved medicine for indigestion.

APPLICATIONS ABANDONED BY APPLICANTS.

No. 17,976.—September 25, 1893.—Charles George Hawkes, 63, King's Cross Road, for a liniment or embrocation.

No. 18,177.—September 28, 1893.—George Thomas Hall, 32, Arthur Street, Plumstead, for an improved skin specific.

Correspondence.

THE NOMENCLATURE OF OFFICIAL REMEDIES.

Sir,—It was with great pleasure that I listened to the able and scholarly paper read by Mr. Joseph Ince within the classic walls of the grand old College of Balliol. In the preparation of the last edition of the British Pharmacopoeia the various committees did good service in altering several faulty formulae, and also re-naming substances according to the latest scientific theories advanced. Surely the time has now arrived when any semblance of "dog-Latin" in our national pharmacopoeia should be swept away, and that the Latin contained in it shall be as pure as that taught in the ancient University of Oxford. I well know that in this age of new synthetic remedies the discoverer has to invent a "coined" word if he wishes to register and patent it, e.g., antipyrine, vaselin, and lanolin. I urge strongly, however, that the example inaugurated in the latest Addendum of substituting scientific terms, as phenazonum, paraffinum molle, etc., be adhered to, and also that the ordinary rules of declension be followed. I am convinced that this is the earnest wish of medical men, who frequently follow the terminology suggested by Mr. Ince. I certainly think that the terms aloinum, pyroxylinum, emplastrum mentholis, haustus sulphonalis, tinctura kinonis, infusum cussonis,

liquor gutta-perchæ, and syrupus chloralis are more correct than those in vogue, and hope that they will be adopted in the next issue. Of course, if any words of Greek origin are introduced, let them also follow the usual declensions of that language, as the old-fashioned *καλωέλας*—*καλωέλας*.

Ramsgate.

W. F. GADD.

THE REVISION OF THE BRITISH PHARMACOPOEIA.

Sir,—A young gentleman from Clapham Park writes somewhat warmly in your last issue concerning my ideas of ointment making, and it is mainly to save him from serious error that I ask you to publish this in reply. I am referred to a paper on the subject to be found in the Journal for April 14 last; that paper I did read at the time—indeed, I have made it a part of my business to read my Journal now for upwards of thirty years—but having reason to disagree with almost every one of the statements therein, and as any reply from me would have been but a repetition of what I had already advanced in a paper read before the Western Chemists' Association, of London, and published in the Journal a year or two previously, I thought it best to take no further notice of it. With reference to boric ointment, let the following anecdote suffice:—When the article was first introduced—the very week we had purchased our new pharmacopœia—a stranger brought us a prescription to be dispensed, for two ounces of this same ointment. Having none ready, we asked for an hour for its preparation, and at once set to work. A breakfast cup saucer supported over a small saucepan of boiling water, a sieve made of a piece of muslin stretched across a two-ounce willow box with the bottom out, kept in position with the rim of the lid, and closed with the lid of another box, and a small gas stove, comprised our set of apparatus. One of us sifted in the powder whilst another stirred, and stirred till cold, with no signs of aeration whatever. The result was eminently satisfactory all round; for the prescription having been taken elsewhere at first and passed on to us, we gained a little *clat* by the transaction, and a good customer into the bargain. Since then we have prepared the article on a somewhat larger scale with uniform success. Sometimes we have been compelled to purchase it ready-made, then it has never been twice alike. Why? I wonder. Many may charge me with being most uncharitable, but I cannot forbear the conviction that it is a case of trade carelessness *versus* pharmaceutical assiduity. As to what is pure lard? why adepes preparatus, P.B., which I reckon to be the most valuable product of pig-life.

West Marylebone.

J. C. HYSLOP.

Sir,—Presuming that the new B.P. will soon be in hand, I beg to offer a few notes on some of the present preparations:—

Mel. Boracis.—It has been proposed to add powdered tragacanth to thicken the product. I probably sell 100 boxes to dispensing this once in a bottle, and find the following form useful:—Take of borax in fine powder, 1 oz.; glycerin by weight, $\frac{1}{2}$ oz.; powdered tragacanth, 20 grains; honey, 8 ozs. Mix.

Acetum Scillæ.—I would order the squill dried and coarsely powdered.

Glycerinum Boracis.—If made somewhat thicker would often be an advantage when required for painting. I suggest thus:—Take of borax in powder, 1 oz.; glycerin, 5 fluid ounces; distilled water, 1 fluid ounce.

Infus. Cascarillæ.—I would make half the present strength. When made as directed, an ounce is very bitter, and it is usually ordered as a vehicle.

Lin. Camphoræ.—The camphor should be ordered cut in small pieces or shaved thinly, and then it dissolves in a few days. One would think this would be always done, but the slowness of solution has been complained of.

Oxymel Scillæ.—In evaporating this it is necessary to cool a small quantity occasionally in order to take S.G. Weighing the whole is often the simpler way, unless a jacketed pan is in use. Experiment showed that honey, 6 lbs., and vinegar of squill, 3 pints, evaporate to 8 pounds. This method having been employed once only should be verified. I give it as a convenience in making on the small scale. The product is light coloured, quite different to the nearly black preparation usually sent out by the wholesale houses.

Paraffinum.—I have previously advocated the introduction of a medium paraffin:—Take of soft paraffin, 6 pounds; hard paraffin, 1 pound; melt together. This answers admirably for nearly all ointments, and is far superior for applying to the eye than the present formula for ung. ac. boræ. Ung. hyd. nit. dil. should be made thus:—Take of nitrate of mercury ointment, 1 oz.; white soft paraffin, 2 ozs. Mix. I cannot agree with Mr. Hyslop that "perfectly pure lard will keep much better and longer than paraffinum molle."

Tinctures.—Having recently published my method of making tinctures, which does not vary much from the present B.P., perhaps I should not say more, but much has been written of late by Mr. Parker and others. I tried forcing with water, but gave it up four or five years ago, except for tr. zingib. fort.; for if the water commences to pass during the night, it often goes through rapidly, and instead of finding an ounce or two of tincture in the morning, perhaps a pint of mixture would be there. Possibly the added water could be regulated as to quantity, but not easily in the half-gallon conical percolator.

Tr. Sennæ.—"An inert preparation of an active drug." (B. S. Proctor.)

Ung. Acid. Carbolic.—I agree with Mr. Hyslop that the acid "oozes out," and that the paraffin basis is unsuited for this ointment.

Ung. Gallæ cum Opio.—Here I would give the formula in full, thinking it advantageous to rub the powders well together first. The following quantities are practically the B.P. proportions:—Take of opium in fine powder, 227 grains; galls in fine powder, 480 grains; benzoated lard, six ounces. Mix thoroughly.

Ung. Hyd. Ox. Rub.—The paraffin medium makes a fine ointment of fair consistency and non-changeable. The levigated oxide should be ordered.

Ung. Hyd. Ammon.—I would continue the present form. It has a very different appearance when made with the paraffin basis.

Ung. Resinæ.—I have not tried the powdered resin, as recently suggested by Mr. Hyslop, but the powdered resin of trade commonly contains a small proportion of farinaceous matter, and probably pulv. resinæ ver. would only be obtained by specially ordering. I use the resin in small pieces, melt in an iron evaporating dish over a naked flame, and quickly add the wax, etc., then strain and stir as directed.

Northampton.

J. CLOWER.

ARISTOLOCHIA GIGAS.

Sir,—It may interest your Edinburgh readers to know that a very fine specimen of the curious Pelican flower, *Aristolochia gigas*, may at present be seen in the stove behind the Palm House at the Royal Botanic Garden here. The plant is in full vigour, and bears a number of very large curiously shaped blooms. These have a powerful offensive odour, which is most marked just after the flower opens. This odour seems to serve the purpose of attracting insects, which reach the flower by climbing up a long pendant tail attached to the perianth. On the Rock Garden there is a fine bloom of a *Yucca gloriosa*, and *Colchicum autumnale* is just beginning to flower. I noticed that the roots of apparently all the *Acacia* species have a peculiar alliaceous odour, as if some volatile sulphur compound were present. Nodules were abundant on them. Can this odour be due to them, or has any one noticed or investigated this matter? The odour is very strong in spring, when the plants are being re-potted.

Edinburgh.

J. RUTHERFORD HILL.

Answers to Correspondents, etc.

Secundus.—1. *Sedum telephium*. 2. *Trifolium arvense*.

J. A.—*Viburnum opulus*.

Clifford.—1. *Mentha aquatica*. 2. *Mentha sativa*, var. 3. *Echium vulgare*. 4. *Malachium aquaticum*. 5. One of the Caryophyllaceæ; send a specimen in flower.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bell, Cocks, Gadd, Hill, Holmes, Morrison, Ransom.

Bragantia Wallichii.

BY DAVID HOOPER,

Government Quinologist.

"Alpam" is the name of a shrub belonging to the natural order Aristolochiaceæ, growing on the western coast of India. Rheede van Drackenstein, the Dutch Governor of Malabar during the latter part of the seventeenth century, seems to be the first botanist who mentions this plant, as "alpam" is figured in 'Hortus Malabaricus,' vol. vi., t. 28, published in 1686-1703. Lamarck, in the botanical portion of 'Encyclopédie Méthodique' (1783), names the plant *Apama siliquosa*, but as Lamarck's knowledge of it was wholly derived from the 'Hortus Malabaricus,' it is most probable that *apama* is a misprint for *alpama*, and that the generic name was intended to be taken from *alpam*, which is Rheede's name.

Bartolomeo,* in his 'Voyage to the East Indies,' says, "The only Malabar plant which I can with certainty call an antidote to poison is a shrub about three or four feet in height, named alpam. The root is pounded, and administered in warm water to those who have been poisoned. A Malabar proverb says, 'Alpam agatta, Vezam poratta.'" As soon as the alpam root enters the body, poison leaves it. The poison referred to by this traveller is that of venomous snakes, especially cobras, which are very plentiful in the jungles of the western coast. Dr. Ainslie alludes to the plant (in 'Materia Indica,' 1826, vol. ii., p. 13) on the authority of Bartolomeo, and recommends it for further investigation, although he had not met with a specimen of the drug, and did not know its botanical origin.

Bengal and Bombay writers on Indian drugs make little or no allusion to alpam, on account of its habitat being confined to the Malabar coast and Travancore. Dr. Dymock found the plant growing in Goa, and merely recorded what others had said about it in 'Materia Medica of Western India,' and because no authentic specimen could be obtained for description and examination, it was omitted altogether from 'Pharmacographia Indica.' Mr. M. A. Lawson, during a recent botanical tour in Travancore, met with *Bragantia* in the hill ranges, and has placed some of the roots at my disposal.

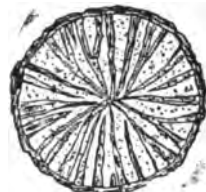
Like other plants of this order, alpam has been supposed to have virtues in the cure of snake-bites, the juice of the leaves and the root being the parts used. Drury states that the whole plant, mixed with oil and reduced to an ointment, is said to be very efficacious in the treatment of psora or inveterate ulcers. The juice of the leaves mixed with Vassambu root (*Acorus calamus*), the root itself rubbed up with lime-juice, and made into a poultice and externally applied, are the chief modes of administering it among the natives.

Bragantia wallichii, R. Br., is a dioecious shrub; leaves oblong, lanceolate, three-nerved at the base, 5-8 inches by 1½-2 inches; flowers in small,

irregular, few-flowered cymes; tube of perianth smooth, lobes acutish; anthers nine, triadelphous; pistil short; stigmas nine, radiating; fruit a capsule (like a siliqua), slender, three to four inches long, terete; seeds one-tenth inch long, 3-gonous, deeply pitted.

There are three species of *Bragantia* natives of India and Malaya. *B. tomentosa*, Blume, possesses intense bitterness, and according to Horsfield is employed by the Javanese as an emmenagogue.

The roots of alpam are light brown in colour, knotted and twisted, about one inch in diameter at the thickest part, and tapering. The thin cortical portion is soft and corky, and may easily be removed by scraping with the finger nail. The substance of the root is tough in consistence. The odour of the bruised root is terebinthinate, and the taste nauseously bitter. A transverse section of the root shows a rather remarkable appearance, although the peculiar structure of the wood of the aristolochias has been pointed out by Lindley, Decaisne, Von Mohl, Duchartre, and others. There are not very evident concentric zones in the wood, but it is broken up in a radiating manner into thin wedge-shaped masses extending in some instances from the cambium to the centre of the root. There is no proper pith, and the parenchymatous system



Bragantia wallichii.—Transverse section of root, natural size (D.H.).

is distributed in alternating layers with the wedge-shaped bundles of wood, like exaggerated medullary rays. The wood is yellowish-brown, and consists of long wood-cells, with some porous vessels running down the centre of each bundle. The parenchyma contains a large quantity of starch, and is almost white in colour.

A description of the structure of the wood of *Bragantia wallichii* with a figure of a transverse section was recorded by Dr. Maxwell Masters in a paper* read before the Linnean Society about twenty years ago. The sketch of the section of the stem shows a very eccentric arrangement of the wood, with irregular zones extending laterally. This indicates a plant with a scandent habit; but Mr. Lawson's specimens were not of that character, and some sections of young stems attached to the roots of these samples showed a regular arrangement of the wood as from a round stem of an erect plant.

The powdered *bragantia* root yielded some yellow, tenacious, resinous substances to ether, which did not crystallise on standing. The mass was heated on a water-bath to dissipate essential oil, and the residue was treated with ammonia water, which only partially dissolved some resin with a yellowish-brown colour. The alkaline mix-

* Fra Paolino de San Bartolomeo was born in Austria in 1748. He joined the Carmelites, and came out to Malabar in 1774, where he was successively appointed vicar-general and apostolic visitor. He remained in India for fourteen years, studying the languages, literature, and religions of the people. His 'Viaggio alle Indie Orientali' was published in Rome in 1796. He died in 1806.

* "Remarks on the Structure, Affinities, and Distribution of the genus *Aristolochia*, with descriptions of some hitherto unpublished Species." Read February 6, 1873. *Journ. Linn. Soc.*, xiv., p. 487.

ture was shaken with ether, and the ethereal layer separated and evaporated left a soft neutral resin of a golden brown colour, giving a reddish-brown solution with sulphuric acid. The clear alkaline solution was acidified and again shaken with ether. The ethereal liquid was fluorescent, and left on evaporation a brittle, golden-brown resin acid. These resinous bodies were not analogous to aristicin, found by Dr. Hesse in *Aristolochia argentina*, by Dr. Warden in *A. indica*, and by myself, only lately, in *A. bracteata*.

After removal of resins from the powdered drug, rectified spirit extracted an alkaloid which formed a combination in the plant soluble in water. The aqueous solution of this extract, shaken with chloroform, afforded a residue containing some resinous matter with an alkaloid. The solution was then treated with ammonia, which caused a precipitate, and again shaken with chloroform. The chloroformic extract left a pinkish coloured residue consisting of impure alkaloid. This was dissolved in acetic acid, rendered alkaline with ammonia, shaken with ether, and the ethereal layer left a whitish residue of almost pure alkaloid. This base had an alkaline reaction, it gave a greenish-red solution in sulphuric acid, a yellowish one with nitric acid, destroyed the red colour of permanganate of potash, and afforded a crystalline acetate. Acidified solutions of the alkaloid gave precipitates with alkalis, insoluble in excess, also with tannin, iodine in iodide of potassium, potassium-mercuric iodide, potassium ferrocyanide, and phosphomolybdate of ammonium. The alkaloid and its salts were intensely bitter; it is probably allied to aristolochine, the source of bitterness in certain plants of this order.

Most of the alkaloid was removed by the spirit extraction, only a small quantity remaining in the extract subsequently made with water. The watery extract also contained a substance which reduced Fehling's test, and on allowing the evaporated extract to stand for some weeks, some hard, white, transparent crystals separated out, which were related to dulcite.

The following table gives the results of the examination of the powdered root of *Bragantia wallichii* or "albam."

Neutral and acid resins, and ext. by ether	1.48
Alkaloid, etc., ext. by spirit	3.43
Water extract	6.71
Starch and fibre	77.02
Ash	3.35
Moisture, etc.,	8.01

100.00

Recent Work in Botany.

CLASSIFICATION OF PLANT TISSUES.*

The method according to which English botanists have been accustomed to classify plant tissues until quite recently is that proposed by Sachs, the three systems of tissue recognised being the dermal, fascicular, and fundamental or ground tissue. This arrangement is not a strictly morphological one, and is only to a limited extent physiological. A scientific morphology must be founded on development, whereas Sachs and De Bary classify

the forms of tissue by purely histological characters, i.e., according to the mature structure of their elements. The lack of a natural grouping in De Bary's book tends to give the impression that anatomy is nothing but an accumulation of detail, and that a morphology of the tissues, based on homology, and comparable to that of external organs, does not exist. However, recent attempts to found an internal morphology of plants, though as yet only partially successful, have given new life to the study of botany.

The recent progress in this direction is mainly due to Van Tieghem, the French botanist, the characteristic feature of whose anatomical teaching is the recognition of the central cylinder or "stele," as a definite region comparable to cortex and epidermis. In the root the central cylinder is perfectly well defined, including within it the ring of alternating bundles of wood and bast, accompanied by a certain amount of parenchyma (conjunctive tissue), the outer layer of which constitutes the pericycle, or limiting layer of the stele. The cortex, the inner layer of which is the endodermis, surrounds the stele, and outside the cortex is the piliferous layer or epidermis.

The same three regions—central cylinder, cortex, and epidermis—exist in the stem. The stele is made up of the vascular bundles and conjunctive tissue, the latter constituting the pith, primary medullary rays, and pericycle. The last-named is often less obvious than in the root, but is characterised by the same power of forming new tissues and organs. At every node the continuity of the main stele is interrupted, and its limits may be difficult to recognise, but it is none the less a distinct region in the stem because it possesses prolongations into the leaves. Where the vascular bundles bend out from the stem into the leaf, they are accompanied by conjunctive tissue, and the name "meristeles" is applied by Van Tieghem to such a bundle or group of bundles entering a leaf, with their enveloping conjunctive tissue. Thus, the stelic tissue of the whole plant is seen to be continuous through all its organs—root, stem, and leaf.

In the typical stems of Phanerogams there is a single central cylinder in direct continuation with that of the main root. This "monostelic" condition is constant in the embryonic stem of all vascular plants. But in many vascular Cryptogams and in the genera *Gunnera* and *Primula*, section *Auricula*, the cylinder divides up above the hypocotyl or first stage of the stem, a number of equivalent steles thus resulting. In most Ferns, and in many Selaginellas, this "polyately" occurs. The modifications of polystelic structure in detail may be studied in Vines' 'Students' Text-Book of Botany' (Sonnenschein), where the views of Van Tieghem have lately been embodied.

"Astely" or "schizostely" is a departure from typical structure characterised by the stele completely breaking up into the individual bundles, each surrounded by its own "peridesm" (the conjunctive tissue at the periphery of any portion of a sub-divided stele, as distinguished from the pericycle which surrounds an entire stele) and endodermis. Typical examples occur in *Equisetum limosum* and other species, in *Nymphaea* and aquatic species of *Ranunculus*, etc.

* Abstract of a review by D. H. Scott, M.A., F.R.S., in *Science Progress* for August.

NOTES ON RHUBARB.*

BY BARNARD S. PROCTOR.

This paper has for its object the putting together into a connected form the various points of pharmaceutical interest concerning rhubarb which have been noted from time to time by the writer, together with such additional experimental results, more recently obtained, as the evident gaps in the old matter made necessary.

The question arose as to the advantage or otherwise of trimming rhubarb root, and after numerous experiments the general conclusion came to from the results was that the removal of the dark coloured outer portion of the root ought not to be countenanced, since that portion is richer than the interior in the alcohol-soluble extractive matters upon which the medicinal value of the root depends.

The following are the results of the action of different solvents upon the root:—

Rhubarb Root.	Cortical.	Central.
Extracted by rectified spirit..	36.0	30.0
" " HCl and proof spirit.....	16.0	17.0
Extracted by KHO and water	26.5	26.0
Insoluble residue	21.5	27.0

It also follows that, in judging of the quality of commercial powdered rhubarb, the brightness or paleness of colour, which may indicate the absence of decayed roots, may also indicate low percentage of active constituents and a high percentage of calcium oxalate.

The examination of a sample of good commercial Chinese rhubarb root, supplied from the Pharmaceutical Society's museum by Mr. E. M. Holmes, showed a remarkably close correspondence between its exterior and interior portions, the following results being obtained:—

Extracting Medium.	Exterior.	Interior.
Strong spirit	39.00	42.70
Spirit, 2; water, 1	8.60	5.05
Spirit, 1; water, 2	1.36	1.00
Cold water	0.60	0.90

These results, however, together with those of Dragendorff, show that there appears to be very little prospect of securing any sharp separation or determination of the proximate constituents of the root by the use of a series of solvents.

Experiments in deodorising rhubarb show that the odorous matter can be removed by chloroform, constituting an oily extract, but after this treatment the rhubarb seems to have the power of developing more of the odorous principle, by the action of air and moisture upon it.

The almost total absence of oil in unpowdered rhubarb root is a point readily ascertainable by the pharmacist and worthy of his attention. The addition

of a small quantity of oil in grinding facilitates the production of a smooth powder and a bright colour, but this is scarcely to be regarded as an adulteration. At the same time a fat exists in the root to the extent, in the Chinese rhubarb examined, of 0.66 per cent. Turmeric is not likely to be found in the rhubarb of pharmacy. Chrysophanic acid is present in both fresh and dried rhubarb, and when it is removed from the powder by means of benzol, a further development of the acid may take place on exposure of the exhausted powder to the action of air, water, and caustic potash.

A consideration of the constituents of rhubarb and their solubilities suggests that a tincture prepared with strong spirit would contain the chrysophan and tannin, accompanied by little or no cathartic acid, whilst a proof spirit tincture should contain all that is active. Again, an extract prepared by distilling off the spirit from this proof spirit tincture would possess rather more medicinal value than the official extract, from the exclusion of inert gum.

The solubility of the cathartic acid is such as permits its extraction by spirit about thirty over proof, but that is about the extreme strength available. Weaker spirit is not available for percolating a fine powder, and a coarse powder is more difficult of exhaustion. In the case of the B.P. syrup the use of weak spirit and a coarse powder results in the solution of matter which induces a tendency to fermentation. The addition of a strong tincture, made with proof spirit or spirit twenty to thirty over proof, to simple syrup is an improvement on the official formula.

Problems of interest arising out of the work that has so far been done concern the nature of chrysophanic and cathartic acids; the proportion of oxalic acid to lime in the ash of rhubarb; and the influence of maturity of the root at gathering, and of long keeping after collection, upon the quantity of fat and chrysophanic acid.

THE ANALYSIS OF MALT.*

BY JOHN A. MILLER, PH.D.

(Concluded from p. 194).

METHOD No. III.

Fifty grammes of ground malt are weighed out as rapidly as possible, then placed in a weighed copper beaker and mixed with 200 C.c. of water of a temperature of 40° C. The whole mixture is then carefully heated on an asbestos plate until the immersed thermometer registers 60° C. This temperature of 60° C. is maintained for twenty minutes, the mixture being almost constantly stirred during this time. At the end of twenty minutes a few drops of the solution are tested with iodine solution in order to ascertain whether the saccharification is complete. If the iodine gives the starch or erythro-dextrin reaction the mash is further heated, the temperature being carefully raised 1° every two minutes until iodine solution ceases to give any reaction. It is very seldom that the temperature will go above 70° C. The flame is then removed, the mash cooled down, and

* Abstract of a paper submitted at the Oxford meeting of the British Pharmaceutical Conference.

* From the *Journal of the American Chemical Society*

enough water added to make the total amount used equal to 400 grammes, or the weight of the mash, that is, the malt plus the water equal 450 grammes. After thoroughly mixing, the mash is thrown upon a plaited filter. The first half of the wort which filters through is thrown back upon the filter, and then all which filters through collected. The specific gravity of this filtrate, or wort, is then taken by means of the Westphal balance. From this gravity the percentage given by Schultze's tables is ascertained, and that number multiplied by 8.75, which gives the percentage of dry extract yield from the malt. The percentage can also be calculated by the use of the following formula:—

$$\frac{(\text{800} - \text{per cent. water}) \times \text{per cent. Schultze}}{100 - \text{per cent. Schultze.}}$$

The Schultze tables are so arranged that they give the amount of extract in 100 grammes of wort of the specific gravity obtained. It would be a natural conclusion that the percentage represented by Schultze tables should be multiplied by 8 in order to obtain the amount of extract in 100 grammes of malt, but this factor gives results which are below the absolute amount of extract which may be obtained from the malt. As the result of actual brewing experience, I am of the opinion that the percentage Schultze multiplied by the factor 8 represents the amount of extract which the average brewer obtains from his material in actual practice, although the absolute amount obtainable on a small scale is higher. Two mashees of fifty grammes each gave:—

	I.	II.
Specific gravity of wort	1.0285	1.0285
Extract calculated from Schultze's table. Factor 8	58.96 p.c.	58.96 p.c.
Factor 8.75	64.487 „	64.487 „
Extract calculated by formula	64.24 „	64.24 „

5.1425 grammes of this wort were placed in a flat-bottomed dish and dried at 105° C. to almost constant weight. Results, viz.:—

	I.	II.
Weight of extract ...	0.3511 gramme	0.3494 gramme.
Average weight of extract	0.3502 gramme.	
Extract	56.03 per cent.	

The same amount dried at 70°-75° C. for about seventy hours to constant weight gave:—

	I.	II.
Weight of extract ...	0.3700 gramme	0.3681 gramme.
Average weight	0.3690 gramme.	
Extract	59.04 per cent.	

In order to ascertain what variation, if any, existed between these results and the absolute amount of extract obtainable, I made another mash from the same sample of malt which had been used for the preceding experiments. Method No. III. was used with this exception, that it was not made up to 400 grammes, but was at once thrown upon a filter and washed with water at a temperature of 58° C. until the filtrate gave no reaction for sugar with Fehling's solution. This filtrate was then made up to 1000 C.c. and an aliquot part dried at 70°-75° C. to constant weight. Two portions of 10 C.c. each gave:—

	I.	II.
Extract by weight in 10 C.c.	0.3237 gramme	0.3236 gramme.
Extract in 1000 C.c.	32.37	32.36
Percentage of extract from malt	64.74	64.72
Average percentage	64.73	

The variations existing between the results obtained is apparent in the following table:—

	Methods.		
	No. I.	No. II.	No. III.
Per cent. of extract calculated according to the directions of the method.	59.01	63.85	64.487
Method III. using factor 8...	—	—	58.96
" " formula...	—	—	64.24
Extract dried at 105° C.	55.87	54.25	56.03
" " 70°-75° C.	58.99	59.07	59.04
Absolute per cent. of extract obtainable.....	—	—	64.73

A comparison of these results shows that methods II. and III. give us figures agreeing closer to the actual amount of extract obtainable from the malt than method No. I., but even these are a little below the actual content. No. III., however, only slightly so. The results obtained by drying at 105° C. are too low and untrustworthy owing to a decomposition during the process of drying, as will be shown later in this paper. Looking at the results of the three methods as obtained by drying the extract at 70°-75°, we find an excellent agreement between the maximum and minimum results, but a wide variation from the absolute amount of extract. This would indicate that a marked amount of starch was not saccharified, and consequently would be lost as extract. It was only obtained by the washing of the grains in warm water.

Extract dried at 105° C.—In order to ascertain why the extract dried at 105° C. was so much lower than when calculated or dried at 70°-75°, a malt analysis was made with the following results:—

	Method III.
Calculated per cent. of extract using factor 8	58.40 per cent.
Extract dried at 70°-75°	58.25 „
" " 105°	54.01 „

The percentage of extract obtained by drying at 105° is over 4 per cent. lower than the percentage of extract obtained by the other methods. This would indicate that either the percentage of extract was actually lower than indicated by the other methods of determination, or that some substance had undergone decomposition and occasioned a loss which reduced the percentage. I was of the belief that the maltose had suffered decomposition at the temperature of 105°, and therefore lowered the percentage of extract.

Determinations of sugar were consequently made:—

1. In the wort obtained by method III. and calculated to the total amount of extract obtained.
2. The maltose or sugar contained in the extract dried at 70°-75° was determined and a calculation made for the total from these results.
3. The sugar contained in the extract dried at 105° was determined and a similar calculation made.

	Maltose.
Method No. III.....	37.50 per cent.
Extract dried at 70°-75°.....	37.50 " "
" " 105°.....	31.50 " "

It will be seen that the percentage of maltose obtained from the extract dried at 105° is 6 per cent. lower than that obtained from the original wort and from the extract dried at 70°-75°. This rather clearly indicates that a decomposition of maltose has taken place with a consequent loss.

In every case the extract dried at 105° was almost black in appearance, and had a distinct burnt sugar odour.

CONCLUSIONS.

1. Methods II. and III. give results almost equal in accuracy, No. III. giving nearer the absolute amount of extract obtainable when the factor 8.75 is used. It is furthermore a preferable method, as it requires less time for the analysis than No. II. And where a number of samples are handled, time is an important item.

2. Method I. is inaccurate, as the results obtained are much below the actual amount of extract.

3. The extract cannot be determined by drying at 105° owing to the decomposition of the maltose at that temperature. This applies to the determination of extract in beer as well as in unfermented worts.

4. The washing of the grains until no sugar reaction is obtained and the subsequent drying of the extract at 70°-75° C. is impracticable, except for scientific purposes, as the amount of time required for the completion of an analysis is too great.

I would recommend method III. as the simplest; it is accurate when the factor 8.75 is used, and requires the least time. It is the method upon which a subsequent paper on diastatic power will be based.

I wish, here, to express my sincere thanks to my assistant, Mr. W. I. Tibbals, for the very able and enthusiastic manner in which he has assisted me in this investigation.

LIQUORICE TRADE OF BATOUM, RUSSIA.

The liquorice root trade with America appears to be on the steady increase. Out of the total quantity of root and paste shipped from Batoum in 1893, 16,720 tons were forwarded to the United States, the balance of 1196 tons being shipped to England and France. Out of the latter-mentioned quantity only about 300 tons were paste and the rest pressed roots. Over-production has brought about more or less of a crisis in this trade, and about 14s. 7d. was being paid towards the end of the year to the peasantry for every ton of root delivered at the factories in the governments of Baku and Elizavetpol. The result was that little or no root was being collected by the natives, and I understand that in consequence of the large quantities of pressed roots in stock, two out of the three root-pressing works of the Caucasus remained inactive during a portion of the past year.—*Consular Report.*

ANTOINE-LAURENT LAVOISIER.*

BY WILLIAM B. THOMPSON.

THE close of the last and the dawn of the present century form important epochs in the history of the science of chemistry. The mark of a period lies in the history of its scientific men. These are the centres and sources from which spring development and intellectual progress, and it is truly well for us to gauge the measure of our gain in a faithful retrospect of the life-work of those who have wrought out to demonstration, truths which time and experience expand into the fulness of knowledge.

The mysticism of alchemy had long been laid aside for the light of a truer wisdom—advancing civilisation aroused and demanded a spirit of inquiry—speculation yielded to investigation—a flame had been kindled—diligence and patience brought their votaries to the task, and the roll of fame is honoured in its inscriptions—Black, Cavendish, Priestley, Scheele, Lavoisier, each of which adds lustre to the sun of human achievement. The fame of these lies in our keeping, and what they have given to the store of knowledge is in part our heritage, of which we should show ourselves to be worthy—worthy in the respect which shall ever be paid to honoured memories, and in the homage of future generations at the shrine of science.

The more fully the histories of these illustrious men become comprehended, the more eager will be posterity to accord the fullest measure of justice to their individual worth, and to the incalculable advantages their discoveries have imparted to human life and to human happiness. The present memoir has, however, particular reference to Lavoisier—Antoine-Laurent Lavoisier—the centenary of whose tragic death has just lapsed, and just been recorded. A corrupted tribunal and the fury of a Parisian mob consigned him and twenty-seven of his associates to death at the guillotine, in one day, in May, 1794. Thus died, at the age of fifty-one, one who was conspicuously ardent and enthusiastic in the pursuit of knowledge, noble and aspiring in all desires and purposes, devoting an active life to humane and unselfish pursuits. The political situation of France at that time was deplorable in the extreme—recklessness and profligacy ruled the hour. Lavoisier's fatal blunder lay in his acceptance of a political position. The faults with which he was charged were those of his associates, not his. His personal record was above reproach, yet innocence was sacrificed to appease the rancour of jealousy and hate; and in order to show the vindictive spirit which prevailed, Coffinhal, who presided at the trial, is said to have exclaimed, when a plea for Lavoisier was offered, "France has no need for men of science!" The deep darkness of ignorance had not been dispelled a hundred years ago. There were many reasons why France should have exulted in the fame of her philosopher, Lavoisier. At the zenith his name became a word of national fame. Yet, passion and fury held such sway over the minds of evil-disposed men, that it required but the momentary descent of

* Reprinted from the *American Journal of Pharmacy*.

the glittering axe to strike off a head that not even a hundred years will suffice to replace with an equal. The ignominy of death detracts not—the name of Lavoisier will ever remain dominant in the chemical world of the last century. This man rendered inestimable service to his country and to mankind. He was guided and governed by an intelligent philanthropy. He was distinguished as an academician and an economist. He devoted a high order of talent to agricultural chemistry, and gave to his countrymen a knowledge to be practically applied in the cultivation and fruition of the soil. Lavoisier was born on August 26, 1743, at Paris, the same decade of years which ushered in his eminent contemporaries, Priestley and Scheele. His preceptors were the Abbe La Caille in mathematics, Bernard de Jussieu in botany, and Guettard in geology and mineralogy—a trio distinguished in science. Lavoisier's first manuscript essay (1765) was upon the subject of calcium sulphate, or gypsum. This was chiefly noteworthy in giving for the first time an explanation of the "setting" or hardening of plaster of paris; also noting the chemical alteration in an over-burnt product. The following year he was awarded a medal by the "Academie des Sciences" for the merit of a plan for illuminating large towns. He became a candidate for election to the august body of the Academy, and on May 18, 1768, gained the privilege of a seat on the rear bench. This was in the thick of the dark and stormy days of the Revolution. Yet, amid profoundly disturbing causes, Lavoisier found time to pursue his themes, and during his twenty-five years of connection with the Academy he contributed over two hundred reports upon various and miscellaneous subjects. These covered a wide range in science and natural philosophy. His varied positions of public life and trust, and more especially during his term as *fermier général* (a state official controlling the financial system), he became deeply interested in the condition of the peasantry of France, in their agricultural employments and interests. He drew up exhaustive treatises on the cultivation of flax and of the potato, and of the liming of wheat. He established working plans for experimental farms, where methods in cultivation could be demonstrated as well as taught, established depots for the collection of agricultural implements, and codes for the more equal adjustment of tithes and taxes and rentals; also rights in pasturage. The economic condition of agriculture in France at that time had become extremely wretched—impoverishment everywhere. Farmers had but few beasts; the winter food of cattle was unprovided in many districts; fields were unfertilised; the yield of corn was not greater than five times the weight of the seed. Lavoisier sought, patriotically, through his knowledge, to remedy these distressing evils. He introduced the cultivation of the beet and the potato; he improved and increased the breed of sheep and of cows. Under this wise foresight and philanthropic effort each succeeding year marked a change for the better in the lot of the peasant. In 1793 the crop of wheat had doubled; the number of beasts had increased fivefold. Yet, withal, in the following year, Lavoisier

died the death of ignominy at the hands of those whom he had spent his life in befriending and benefiting—wicked, monstrous ingratitude! He was made a victim of popular prejudice, and was an unfortunate citizen of a crumbling, rotten, and hopelessly fallen dynasty. Lavoisier was the author of savings and discount banks, workhouses, insurance societies, establishments for the tutoring of nurses, plans for the formation of canals, and for exploiting the mineral resources of the country.

Thus is presented a history of a brief life, yet that of one thoroughly imbued with the ardour of his nationality—a man of intense zeal and large philanthropic purpose. The gifts of his mind were generously and bountifully given for the benefit of his race. His varied knowledge had no selfish application. He appears to have pursued and investigated truth for the sake of truth. His life is a lesson for the studious. In philosophy and science there is no brighter or more illustrious exemplar than Lavoisier. Let his name be for ever honoured and revered!

WHY NOT TURN YOUR KNOWLEDGE TO ACCOUNT?

BY FRANK EDEL.

The pharmacist is often called upon to dispense odd chemicals, and if he were to keep anything like the assortment in stock that he may have calls for occasionally, he would soon find his shelves stored with goods, in some instances likely to spoil, and in others to be unsaleable. It is astonishing how often pharmacists let customers go without once remembering that on their shelves are all the chemicals necessary to produce easily and simply the required article. And if a given substance is wanted in the form of solution, its preparation often would require but a minute.

The pharmacist, by so doing, can easily make a reputation for himself in the manufacture of these goods, and one can often hear people say, "We will go to So and So's pharmacy, for if he hasn't got it in stock, he will make it for us." It is astonishing how soon such things become known, and when known, what a powerful influence they are towards building up a tradesman's business.

The writer calls to mind an instance of a physician who, after going the rounds of the stores, inquiring for sub-iodide of bismuth, came to the establishment where he was employed, and inquired for the article. He was told that it was not in stock, but could be made for him within a certain time. At another time he wanted iodide of calcium, and then saccharated iodide of iron, and thus became a regular customer. Another time, a certain photographer came in and asked for chloride of lead and sulphate of lead. He was told that they were not in stock, but would be made for him. This gentleman afterwards took particular pains to send people to the store.

Elsewhere, in an article on the remedy for the specialty nuisance, the writer has said that there is no place where a pharmacist can so easily make a reputation for himself, no place where he can occupy his spare time to so much advantage as in laboratory

work. And this work can be done without neglecting the mercantile part of his business. It is not the purpose of this article to advocate the making of chemicals in the drug store, for the reason that in most cases they can be purchased from reputable manufacturers for as little money as they can be made for by the pharmacist. And, therefore, there is no argument in favour of making them on the ground of economy.

But with odd chemicals it is different. The pharmacist cannot afford to buy them, for the sale would not justify it, and in most instances they can be prepared from those chemicals carried in stock, and many of them can easily be made. Take, for instance the lithium salts. Having the carbonate of lithium in stock, the pharmacist is able to supply the citrate, salicylate, benzoate, borate, etc., if in solution, in a few minutes. And he can, also, easily prepare the salts themselves when so desired. The same is true of the ammonium salts, also of those of potassium and sodium.

Some years ago, while employed in a pharmacy where many prescriptions calling for solution of benzoate of ammonium, ten grains to each drachm, were filled, the writer had his attention called to the insolubility of the preparation as sold in the market. This was entirely due to the salt being of acid reaction instead of alkaline, as directed in the pharmacopoeia. Of course, solution could be effected by heat, but it would crystallise out when cold. This difficulty was remedied by adding ammonia in slight excess. In order to overcome the trouble, a permanent stock solution was made up, containing ten grains to the drachm. This solution was made by taking the proper amount of benzoic acid and water, applying heat, and adding ammonia to slight excess, filtering, and adding water to make the proper volume. Thus we were able to dispense these prescriptions rapidly and properly. It is an old practice, and a good one, to keep a 50 per cent. solution of potassium acetate on hand for dispensing. Such a solution keeps well, and is easily made.

It is astonishing what a number of chemicals the pharmacist can prepare himself, with comparative ease, if he will consult his reference works. Such work makes him a better pharmacist, and gives him a more accurate and practical knowledge of chemical processes and the chemistry of what chemicals he handles. In fact, there is no line of work so conducive to the actual thoroughness of the pharmacist as this. It enables him better to understand the action of one chemical upon another, and to forecast results of combinations ordered in prescriptions, and often to save physicians from serious error. Again, it gives a clear and more practical insight into the arithmetic of chemistry, and in every way conduces to the benefit of the pharmacist. And the good which comes from this line of work is the advantage it is to the apprentice. He thus becomes familiar with working-methods, and it is of great advantage to him. Seeing practical demonstrations of what pharmacy should be, he is better able to appreciate the teachings of the schools.

— *Western Druggist.*

ON CITRIC ACID FERMENTATION.*

BY DR. C. WEHMER,

Hyphomycetæ are, as well as other fungi, able to effect fermentations under certain circumstances. A process of this kind, by which as much as one-half of the sugar used is converted into oxalic acid, is well known. I made this process, hitherto the only acid fermentation induced by Hyphomycetæ, the subject of a more elaborate investigation.

Further research has brought to light another case similar to oxalic acid fermentation in many ways, the product of which is another organic acid not hitherto obtained under such conditions. I call it "citric acid fermentation."

Certain moulds possess the property of converting a considerable proportion of the sugar contained in the nutritive solution into an organic acid which is, in constitution and properties, identical with that found in lemons, and can be obtained easily and abundantly in well-formed crystals. The nutritive solution becomes very acid after a little time, and the amount reaches 5 per cent. and more. Experiments on a larger scale yielded the acid in such considerable quantities that the commercial application of the method promises to be successful.†

The fungi which effect the fermentation are microscopically hardly to be distinguished from the well known *Penicillium glaucum*. They form densely interwoven green films of so energetic a growth as to spread over the largest surfaces in a few days' time. Compared with *Penicillium* they are distinguished, amongst other things, by the structure of the conidiophores; otherwise they are closely allied to it, though the discussion of their systematic position must be deferred owing to our incomplete knowledge of their development.

The more exact examination of the two very similar species proved that they were hitherto undescribed. It was not possible to refer them to the genera *Penicillium*, *Eurotium*, or *Aspergillus*, as they are defined at present. Thus the creation of a new genus was expedient, and I propose the name "*Citromyces*" for it. I call the more completely known species, to which a third will probably be added, *Citromyces pfefferianus* and *Citromyces glaber*.

The spores of these fungi are found to be rather common in the air. Placed on suitable substrata they soon develop into white tufts, which, however, are usually soon overgrown by other species (*Penicillium*) hence it is somewhat difficult to obtain pure cultivations. They may be often met with on fluids containing sugar, or on fruits, particularly acid ones.

I may briefly point out a few details relating to the process of acidification in respect to the development of the fungus, the substratum, temperature, and supply of oxygen.

Solutions of sugar containing the necessary nutritive

* Condensed translation of a communication to the Berlin Academy. Reprinted from the *Kew Bulletin*.

† Artificial citric acid is already produced on a large scale, and by a method based upon what is stated here, by the *Fabriques de Produits Chimiques de Thann et de Mulhouse*, at Thann, in Elsass.

material present the most favourable conditions for its growth, as well as for the formation of the acid; both, however, are independent of each other, though their optima of temperature approximately coincide.

But the formation of acid can take place beyond the maximum of growth, whilst, on the other hand, the growth of the fungus can proceed without the formation of acid. Temperature is a condition as important to the process as the chemical constitution of the substratum and the presence of sufficient oxygen; for it is not the limited access of oxygen which induces the accumulation of acid. It is not, however, possible at present to be certain whether the carbonic acid set free does not affect the fungus injuriously; there are indications that it does. At all events, absence of air soon brings the vital phenomena to a standstill, and in an atmosphere of carbonic acid neither germination of conidia nor any further development takes place. Light, however, is of no importance; germination, growth, formation of conidia, and acidification take place at an unaltered rate in absolute darkness.

Although citric acid, when present in quantities of several per cents., is rather beneficial than otherwise to the growth of the fungus, which can endure as much as 10-20 per cent., the presence of inorganic acids on the other hand is extremely injurious, and they restrict the growth of the mycelium to a very slow rate, even when present in mere traces.

As in other well-known cases of fermentation, a further production of acid may be obtained by precipitating that already formed. Thus, it is easy to convert as much as one-half of the sugar used into acid; 30 grammes of dextrose yielded about 16 grammes of acid. By this means, the conversion is also accelerated, and the breaking-up of the sugar, with which the formation of acid is evidently closely connected, proceeds more rapidly. Other agents may also act in a similar way, as, for instance, the presence of saline compounds of chlorine, etc. The formation of acid continues as long as there is any vitality in the fungus film and available material in the liquid. The acid, however, which is found in the fermenting fluid at a given time, is the residue which results from the two parallel processes of acid formation and acid destruction; the latter eventually prevails, and finally every trace disappears in older cultivations. The destruction of the acid by the fungus is easy to prove by experiment.

By precipitating the acid in the form of a stable salt we eliminate the destructive agency, and favour, at the same time, the causes which favour the accumulation of the acid; this method gives a more exact idea of the process of acidification. It is found to be by no means continuous and uniform at different times, but its rate describes a rather suddenly ascending and descending curve, which is in close relation to the amount of the conversion of sugar effected by the growing fungus.

The formation of the acid proceeds most actively at the time of maximum vitality of the fungus-film; it increases before and decreases after this period.

I may point to the rather interesting comparison with the production of oxalic acid. In this, favour-

able conditions of fungus growth (heat and presence of chlorine compounds) promote the rapid destruction of the acid, and prevents its accumulation in the cultivations. Under similar conditions the production of citric acid is not only not checked, but even advanced. The difference may perhaps depend on the lesser capacity of citric acid for being oxidised.

The comparison is important also in other respects. As much as one-half of the sugar consumed can be converted into oxalic acid without impairing the fungus growth. In the production of citric acid, the withdrawal of very considerable quantities of this acid has actually no demonstrable influence on the development of the fungus. We must therefore regard the citric acid as a product of metabolism, to which the fungus is comparatively indifferent. It is, however, evident that when with a given production of fungus material one-half of the consumed sugar is precipitated as citric acid, the other accessory product must decrease in quantity. In this instance this is the carbonic acid into which also under other conditions part of the citric acid is converted. The question now is whether the relation is a direct one. On the whole, I should, taking into consideration the observations of O. Warburg on Crassulaceae, rather prefer this view to other hypotheses. The breaking up of the sugar molecule results in a great deal of the citric acid produced, besides perhaps other compounds, yielding ultimately carbonic acid as a product of oxidation. Although we may thus consider the acid actually liberated as an intermediate product of metabolism, we leave the question of its constant presence with our fungi undecided, though possible. I may mention, by the way, that oxalic acid occasionally appears in the fermentative process. But there is no necessity to trace back the totality of the material broken up by metabolism, especially the whole of the carbonic acid derived from respiration, to molecules of organised living substance.

A closer study of the metabolism in this direction might throw light on the process of respiration; for mere determination of carbonic acid without considering other conditions cannot naturally explain it.

Finally, I must point to the constitution of citric acid as having an important bearing on the theory of these fermentative processes. It is clear that it cannot be regarded as a direct product of sugar-oxidation.

CAMPHOR TRADE OF TAMSUI, CHINA.

The trade in this product is rapidly growing in importance. The export in 1893 was much the largest on record, and more than double that of the previous year, amounting to 32,134 cwts., against 15,440 cwts. for 1892, which total, however, in consequence of disturbances on the border, was smaller than in 1891. To all appearance this branch of business is destined to increase still more in the near future, especially if certain difficulties which somewhat detract from the market value of Formosa camphor as compared with the Japanese product can be overcome.—*Consular Report.*

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, SEPTEMBER 22, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C. where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, 17, Bloomsbury Square, London, W.C.

THE CONGRESS AT BUDAPEST.

THE pharmacy section of the Congress was opened in due form on the 3rd inst. by Dr. GYULA JARMAY, the President, upwards of fifty members being present on that occasion. In his opening address Dr. JARMAY referred to the establishment of an independent section of pharmacy as being an appropriate indication of the fact that there is an intimate relation between the pharmacist's art and the work now being done to promote public health. He congratulated his colleagues on the opportunity thus offered for extending their sphere of usefulness to the community, and on behalf of the pharmacists of Budapest heartily welcomed the foreign visitors.

The first paper read was by an Hungarian pharmacist, Herr GALLIK, dealing with the appointment of pharmacists as public analysts. It was urged that their technical experience and qualifications specially fitted them for the work of examining articles of food and drink. That view was very generally adopted in the discussion which followed. Professor BELOHOUBEK and others suggested that in view of such appointments being made the educational training of pharmacists in chemical analysis should be suitably extended. A resolution was unanimously passed by the section to this effect. At the subsequent plenary meeting of the Congress, when the sectional resolutions were brought up for confirmation, this resolution was rejected in consequence of a representation by Professor CORFIELD that no one who understood the difficult and delicate nature of the work to be carried out in the analysis of articles of food would entrust it to dispensing chemists. This peculiarly British view of the

matter seems to have carried more weight than it was entitled to have at an international congress. It appears also to have been put forward as an objection to the resolution passed by the pharmacy section without sufficient appreciation of the proviso that adequate chemical training for the duty was a condition recognised as necessary. But the plenary sitting of the Congress was altogether the least satisfactory part of the proceedings, having been very poorly attended, besides being wanting in many other respects. The opinion expressed by the pharmacy section of the Congress as to the appointment of pharmacists as public analysts is in full accordance with the view held on this subject in Germany and France, and it does not in any degree leave out of consideration the necessity of full scientific qualification on the part of those entrusted with the important duties attaching to the office of public analyst.

The next subject brought forward at the pharmacy section of the Congress was the international pharmacopoeia. Papers were read by Herr CHRISTOMANOS, of Athens, and Professor VULPIUS, suggesting that a new committee should be appointed to carry out the work, and that application should be made to the governmental authorities of different countries for assistance in its execution. Herr von WALDHEIM reported what has already been done in this direction, and showed that the three principal objects to be aimed at are the adoption of an absolutely definite, nomenclature uniformity of methods of preparation, and uniform strength of pharmacopoeia preparations. With the full attainment of those objects, in regard to potent preparations, the aim of a universal pharmacopoeia would be secured. But he regards that result as a work of time that can only be brought about by agreement among the members of the committees entrusted with the preparation of pharmacopoeias in different countries. He disapproved of the proposal to solicit assistance from the governments as being unpractical, and thought that the end in view might be better accomplished by pharmacists relying upon their own capabilities and mutual agreement. After a long discussion it was finally decided by a large majority that the committee appointed by the Congress in London in 1881, including representatives of all countries, should be requested to continue its work, and take such further steps as may be deemed advisable.

At the second sitting of the section, papers were read on the subject of the inspection and control of pharmaceutical establishments, which were of interest more especially in relation to the conditions obtaining in continental countries. Herr HEGGER, of Vienna, read a paper describing the usages of different countries in regard to the establishment of pharmacies, and Herr GALLIK one on different systems of control. The remainder of this and

the concluding sitting of the section were occupied with the reading of papers relating to various subjects of pharmaceutical interest, the conservation of drugs, the methods of testing adopted in the Hungarian pharmacopoeia, and the apparatus most suitable for the purpose.

After the close of the second sitting of the section the foreign visitors were very hospitably entertained at dinner by the members of the Pharmaceutical Society of Budapest. The chair was occupied by Dr. JARMAY, who, together with Herr Török and the other members of the Sectional Committee were, on that occasion and throughout the whole of the Congress, indefatigable in their efforts to do honour to their guests and afford them every facility for becoming acquainted with each other and with the numerous attractions of their beautiful city. Though upwards of two hundred persons were present at this dinner, it contrasted favourably with some of the other entertainments connected with the Congress, which were of a more tumultuous nature, as, for instance, an excursion to the wells from which the Hunyadi-János water is obtained, and the reception at the museum at the commencement of the Congress, which furnished material for satirical comment by the local comic papers. But it was the guests rather than the hosts who were responsible for the objectionable features of those gatherings, unless, indeed, excess of hospitality may be regarded as an excuse for the former. One of the most delightful excursions was that to an estate of Count NICOLAS ESTERHAZY, about two hundred thousand acres in extent, where a large party was most hospitably entertained during the day, and had an opportunity of witnessing the more than regal state still characteristic of the every-day life of an Hungarian magnate.

THE SALE OF MEDICINAL PREPARATIONS CONTAINING POISON.

UNDER this heading, three weeks ago we referred to the opinions expressed by the organ of the manufacturers of stamped proprietary medicines, on the result of the late appeal, and quoted the editor's advice that grocers should abstain in future from vending medicinal preparations containing scheduled poisons as ingredients. In the *Grocer* for last week the subject is considered from the unqualified dealers' point of view, and with evident reluctance to accept the position as defined by the judges in the Court of Appeal. Though it is acknowledged that at each stage of the ARMSON case it was clearly held that the article in dispute could only be sold by registered chemists, and though the decision has been arrived at not to make further appeal to the House of Lords, it is stated to be yet undecided whether the question will again be

fought in regard to the particular article to which that case referred. "Some of the more enthusiastic now believe that the contest between the grocers and the chemists is thus over; and they say that the law has now stated that only registered chemists and druggists may sell or keep open shop for selling proprietary articles that contain an 'appreciable' amount of poison. But what is an 'appreciable' amount? According to the ARMSON case, one-tenth of a grain in a fluid ounce is such a quantity. On the other hand, in the DELVE case, an 'infinitesimal' amount in a proprietary medicine does not limit its sale. But how is the seller of these goods to know what poison, and how much of it, is in any given medicine? The trade may call upon the manufacturers of proprietary medicines to declare the amount of poison in their preparations, and insist that they shall bear the responsibility arising from any inaccurate or misleading statement on the point; or they may take a short cut to the solution of the difficulty by refusing to sell retail any such preparation containing poison."

The "short cut" would certainly seem to be the most honest and generally satisfactory way out of the difficulty, for conscientious and law-abiding citizens. And the suggestion of a further difficulty—arising in cases where manufacturers have declared that they had ceased to add poisonous ingredients, and after a certain interval reverted to their former custom—only emphasises the desirability of total abstention, on the part of grocers, from engaging in business for which they are not in any degree qualified. The position is indeed "a most unsatisfactory one, and can hardly be left as it is." Even if—as stated on what may be regarded as doubtful grounds—"manufacturers of proprietary preparations are fully alive to the fact that the grocer is a far better distributing medium for their goods than the chemist," that does not render the Pharmacy Act invalid, or justify infractions of the law.

The numerous arguments adduced by our contemporary in support of its case are either irrelevant or incorrect. In the first category must be placed the resuscitation of the supposed agreement between the manufacturers of proprietary medicines and the promoters of the Pharmacy Act in 1868, and in the second the assertion that the Pharmaceutical Society has acted upon such a bargain for twenty-four years. It is wrong, again, to say that the Inland Revenue authorities issue "patent" medicine licences, the correct style being "stamped medicine licences," as anyone possessing a licence can readily ascertain on the most cursory inspection. Further, it is quite beside the question to state that the trade and the public have understood the term "patent medicines" to include medicines which are not patented, since popular error affords no justification for illegality.

It is merely playing with words to assert that the judges "took a somewhat sentimental view of the matter, and considered that by so doing they were safeguarding the public health." It is pleading ignorance that does not exist to ask "how that can be done by giving a certain class of traders a monopoly in the distribution of sealed goods, the ingredients of which they do not know?" Such a plea of impracticability serves only to show that there is good ground for the claim now being made in the medical papers that the composition of all proprietary medicines should be disclosed on the labels of each package, and that the neglect of this condition should subject the vendors to a penalty.

The key to the whole situation is for grocers and others to be content to obey the law, which insists that scheduled poisons must only be sold under certain prescribed conditions, by duly registered persons. If individuals who do not possess the necessary legal qualification desire to make the sale of medicines a part of their business, they will do well to act upon the advice of their former mentor, the *Patent Medicines Journal*, no less than that of the *Grocer*, which now warns them to be careful "in all their purchases of proprietary medicines to obtain an assurance from the manufacturers that they are such as can be legally sold by unregistered persons." Better still, perhaps, they might, with very great advantage to themselves and the public, altogether abstain from ignorantly trafficking in medicines of any sort or description.

SCHOOL OF PHARMACY.

THE School of Pharmacy of the Pharmaceutical Society will be opened for the fifty-third session on Wednesday, October 3. The distribution of prizes to the successful students of last session, by the President—Mr. MICHAEL CARTEIGHE, will take place on the afternoon of that day, at the Society's House, Bloomsbury Square. The chair will be taken at three o'clock precisely, and the inaugural sessional address will be delivered by Mr. WALTER HILLS, the present head of the historic firm of JOHN BELL and Co., and Member of Council of the Pharmaceutical Society. The Dean of the School, Professor REYNOLDS GREEN, Sc.D., M.A., will be in attendance on October 3, between the hours of 10 a.m. and 1 p.m., to enter the names of students, issue cards of admission, and furnish information relating to the courses of study. The Professors and Lecturers will also be present, prepared to advise students with reference to their special subjects. Applications for admission to the School and for further information should be addressed to the School Secretary, Mr. F. W. SHORT, B.Sc., 17, Bloomsbury Square, W.C.

The Sheffield School of Pharmacy, conducted by the local pharmaceutical association, will commence its tenth session on Thursday, October 11, when an introductory address will be given by Mr. C. B. ALLEN, of Kilburn, Member of Council of the Pharmaceutical Society. By means of this school, it will be remembered, the Sheffield Pharmaceutical and Chemical Society has endeavoured to impart

to students a sound foundation of scientific and technical knowledge, during the period of apprenticeship. Though, naturally, very great difficulties have been encountered from time to time, the good record has now remained unbroken during nine consecutive years, and the number of young pharmacists who have thus received assistance and encouragement has been surprisingly great.

PHARMACY FAIR AT BOSTON.

ACCORDING to the *Boston Journal*, preliminary arrangements have been perfected for the American Pharmacy Fair, which is to be held in Mechanics' Hall, Boston, May, 1895. This exposition will be the first of its kind ever attempted in America, and is projected by Mr. BENJAMIN JOHNSON, publisher of the *New England Druggist*, who is supported by some of the leading American pharmacists. It is expected that the fair will be opened on or about May 1, 1895, and that it will remain open for three weeks at least. Assurances have already been received from various quarters of sufficiently large and varied exhibits to make the exhibition a success. Part of the exhibits will illustrate the methods of chemical teaching, and there will be an exhibit of the constituents of foods and medicines, each important constituent of any article being shown as a separate preparation, in the average natural proportion in which it exists in it. It is also expected that the great exhibit shown by Harvard University at the World's Fair last year will be secured for this fair, containing as it did samples of over 200 new compounds, as well as fifty old substances specially investigated in the chemical laboratory. The case attracted widespread attention, containing, as it did, many compounds rare enough to be considered as chemical curiosities. There will also be exhibits of the thousand and one things which may be found in any well-appointed drug store.

THE HEMP DRUGS INQUIRY.

It is stated that the general conclusion of the Hemp Drugs Commission as stated in the report is that the total prohibition of the cultivation of Indian hemp is neither necessary or expedient, when allowance is made for the ascertained effects and social religious feeling, and the possibility of present consumers being driven to more dangerous drugs. The policy advocated is one of control, restricting excessive and restraining moderate use. The means to be adopted involve adequate taxation, prohibition of unlicensed cultivation, and limitation of shops. A Government monopoly is not recommended; import and export duties are undesirable; and a direct duty is considered best. With little interference from Government it is thought a direct duty might be made to act as a check on consumption. Practical recommendations are given in detail by the Commission.

EDINBURGH PHARMACY ATHLETIC CLUB.

THE third annual picnic of this club took place on Monday last. Favoured with splendid weather, the party, to the number of about thirty, drove out fourteen miles to Crichton Castle, where an enjoyable day was spent, Edinburgh being reached about 10.30 p.m., everybody having thoroughly enjoyed the outing.

British Pharmaceutical Conference.

PAPERS TAKEN AS READ AT THE OXFORD MEETING.

NOTE ON TINCTURA ERGOTÆ AMMONIATA.

BY J. T. HORNBLOWER.

The subject of this note was suggested to the writer a short time back by a question being put to him as to why a sample of tinct. ergot. ammon. remained clear on adding it to water, and another become cloudy. The question was therefore—Should the tincture remain clear on adding it to water (3j to 2 fl. ozs.) or not?

On looking at the subject in a cursory manner, I think one might be pardoned for saying the tincture should become cloudy, or even milky, seeing that the menstruum is spt. ammon. aromat.; and, indeed, if I had been asked if a tincture would do so, instead of being told it did not do so, I should have said yes. Accordingly, I added some to distilled water in the proportion of 3j to 2 fl. ozs., and the result was a clear mixture. Then came the question—What was the reason? This, I surmised, was owing to the large amount of fixed oil which ergot contains. It might be that this oil had the power of removing the essential oils from the spt. ammon. aromat., and to a great extent this proved to be right, but not quite so. The following experiments were then done to try and find the reason:—

Ten ounces of ergot were exhausted of oil with 720 ether, the oil resulting being some 3½ ozs.

1. Half ounce of this oil was shaken up with 4½ fl. ozs. spt. ammon. aromat. (these quantities were used because ½ oz oil would be about equal to 1½ ozs. ergot, which would equal 3 fl. ozs. tincture, which would require 4½ fl. ozs. spt. ammon. aromat. to produce it if made strictly B.P.C.). After standing, etc., and a portion filtered off, 3j of this spirit was added to 2 fl. ozs. distilled water, the result being a perfectly clear mixture.

2. Half ounce of the same oil was shaken up with 4½ fl. ozs. spt. aromat. sine ammonia (this being a spirit of the same alcoholic strength as spt. ammon. aromat., and containing the essential oils, but no ammonia). On filtering off a little of this spirit, and adding it to water as before, a cloudiness took place, but nothing approaching the milkiness formed on adding an equal quantity of spt. ammon. aromat. to water. The partial removal of the essential oils is, of course, due to the difference in solubility of these oils in the fixed oil and "spt. aromat."

3. To the mixture of this latter fixed oil and spt. aromat. sine ammonia, the proper amount of ammonia, caustic and carbonate, was added to form spt. ammon. aromat., and the mixture again well shaken for some time, and then a portion filtered off. This, on adding to water as before, remained quite clear. The addition of the ammonia (caustic) had evidently wrought the change, by the formation with the fixed oil of a small amount of soap, which had doubtless the effect of keeping in solution, when added to water, that portion of the essential oils which the fixed oil had not removed.

4. One ounce of ergot was then taken, made into a No. 36 powder, and then into tincture with spt. aromat. sine ammonia. On adding this tincture to water as before, the same amount of cloudiness took place as when the "spt. aromat." treated with oil as in No. 2 experiment, was used, thus showing that the oil either distributed through the ergot, or treated separately had practically the same effect on the "spt. aromat.," that being partially removing the essential oils from it.

5. The equivalent of 1 oz. ergot exhausted of its oil was now taken and made into tincture, B.P.C. This should have made a milky mixture with water if the fixed oil had been thoroughly removed from the ergot, as none being there it could neither act on the essential oils in the spirit nor the ammonia act on it. On diluting the tincture with water a thorough cloudiness took place, though not so much as a proportionate amount of spt. ammon. aromat. would have caused with water. The fixed oil was evidently not thoroughly removed from the ergot, or more cloudiness must have been produced, for on again treating a portion of this ergot with more ether and making another tincture this, on adding to water, became more as expected. Of course, there was not sufficient fixed oil left in the ergot to effect a solvent action on the essential oils of the spt. ammon. aromat., but there evidently was sufficient to form soap enough to make the tincture remain more clear than it otherwise would have done on adding it to water.

6. To 2 fl. ozs. distilled water add 5 minims of a solution of hard soap (grs. 40 in 1 oz. spirit), and then add 3j spt. ammon. aromat. The mixture will become nearly clear, and on adding another 5 minims of soap solution, quite so. The presence of this amount of soap evidently keeping the essential oils in solution.

The reason therefore, I think, why tr. ergot. ammon. remains clear on adding it to water is that the fixed oil of the ergot, and the soap formed from it by the ammonia, respectively remove part, and prevent the remainder of the essential oils from being thrown from solution; this, however, can only apply when the whole of the tincture has been in contact with the ergot, as in percolation—for if made by maceration, and any deficiency in quantity of finished tincture made up by adding spt. ammon. aromat., a cloudiness would be produced, dependent on the amount added.

A SOAP BASIS FOR LINIMENTS.

BY E. W. LUCAS, F.C.S.

The many advantages that the basis of liniment of potassium iodide has over the rest of the Pharmacopœia liniments induced the suggestion as to whether it would be practicable to adapt a similar basis to other preparations of the same class. It is exceedingly probable that such liniments would be more readily absorbed by the skin, while they would be much more cleanly and easy of application, and at the same time the danger of mistake for medicines for internal use would be minimised. The author, therefore, proposes the adoption of a soap basis, from which all of the liniments now dealt with could be readily prepared.

Basis Saponis.

Take of—

Soft soap	1 ounce.
Curd soap	5 ounces.
Glycerin	2 fluid ounces.
Distilled water	a sufficiency.

Reduce the curd soap to fine shreds, and dissolve it with the soft soap in 16 ounces of water, by the aid of gentle heat. Add the glycerin and sufficient distilled water to make the strained product weigh 1 lb. 10 ozs. Pour into a suitable vessel and allow to solidify.

Linimentum Aconiti.

Take of—

Alcoholic extract* of aconite	1½ ounces.
Distilled water	4 fluid ounces.
Soap basis	12 ounces.

Liquefy the soap basis on a water-bath, add the distilled water, and dissolve the extract of aconite in the mixture, and as soon as it begins to cool, pour into

* Prepared in the same way as ext. belladon. alcoholic.

a large mortar, and stir briskly until a smooth paste is produced.

Linimentum Belladonnae.

Take of—

Extract of belladonna (alcoholic) 1½ ounces.
Distilled water 4 fluid ounces.
Soap basis 12 ounces.

Liquefy the soap basis on a water-bath, add the distilled water, and dissolve the extract of belladonna in the mixture, and as soon as it begins to cool pour into a large mortar, and stir briskly until a smooth paste is produced.

Linimentum Camphoræ Compositum.

Take of—

Camphor 2 ounces.
Oil of lavender..... 1 fluid drachm.
Strong solution of ammonia 5 fluid ounces.
Rectified spirit..... 2 " "
Soap basis..... 14 ounces.

Dissolve the camphor and oil of lavender in the spirit, and add the solution by degrees to the previously melted but cool basis, stirring briskly after each addition. When nearly cold, add the solution of ammonia, and continue stirring until a smooth, creamy paste is produced.

Linimentum Iodi.

Take of—

Iodine
Iodide of potassium... of each ½ ounce.
Rectified spirit
Distilled water..... of each 1 fluid ounce.
Soap basis 10 ounces.

Dissolve the iodine and potassium iodide in the spirit and water, and add the mixture by degrees to the previously liquefied soap basis. As soon as it begins to thicken, pour into a large mortar, and stir briskly until a smooth paste is produced.

This is about one half the strength of the pharmacopœia liniment, but it will probably be found quite energetic enough, owing to its being more rapidly absorbed. The title of the present liniment it is proposed should be changed to "pigmentum iodi," under which name it might be retained.

Linimentum Opii.

Take of—

Extract of opium..... 2 drachms.
Distilled water..... 2 fluid ounces.
Soap basis..... 10 ounces.

Dissolve the extract of opium in the water, add the previously liquefied soap basis, and as soon as it begins to thicken, pour into a large mortar, and stir briskly until a smooth paste is produced.

Linimentum Potassii Iodidi cum Sapone.

Take of—

Iodide of potassium 1½ ounces.
Oil of lemon 1 fluid drachm.
Distilled water 2 fluid ounces.
Soap basis 10 ounces.

Dissolve the iodide of potassium in the water and add it to the previously liquefied basis. As soon as it begins to thicken, add the oil of lemon, and pour the mixture into a large mortar, and stir briskly until a smooth, creamy paste is produced.

Linimentum Saponis.

Take of—

Camphor
Rectified spirit of each 1 ounce.
Oil of rosemary ½ ounce.
Distilled water 2 fluid ounces.
Soap basis..... 18 ounces.

Dissolve the camphor in the oil of rosemary and spirit, and add by degrees to the liquefied but nearly cool basis, stirring constantly until a smooth, creamy paste is produced.

Linimentum Terebinthinae.

Take of—

Soft soap
Castile soap in shavings... of each 1 ounce.
Distilled water 2 fluid ounces.
Camphor 1 ounce.
Oil of turpentine..... 16 fluid ounces.

Place the oil of turpentine in a narrow-mouthed bottle with the soaps and the camphor, and stand in a vessel of hot water, agitating occasionally until solution has been effected. Add the water all at once, and shake vigorously until a creamy white liniment is produced.

TINCTURE OF IODINE AND ITS ANALYSIS.

BY J. F. LIVERSEGE, F.I.C., PH.C.

1. *Composition.*—The British Pharmacopœia orders half an ounce each of iodine and iodide of potassium to be dissolved in one pint of rectified spirit, which is required to contain 84 per cent. of absolute alcohol, and to have a specific gravity of '838. The percentage by weight of the ingredients of the tincture can therefore be calculated. As it is practically inconvenient to weigh the portions of tincture for analysis, the composition in grammes per 100 C.c. is also required. If the Pharmacopœia gave the volume of the product or its specific gravity, these values could also be calculated, but as it does not, experiment is required. I found that when 2½ grammes each of iodine and iodide of potassium are dissolved in 100 C.c. of rectified spirit the volume of the product is 101·2 C.c.

The theoretical composition of the tincture is therefore:—

	100 grammes contain.	100 C.c. * contain.
Iodine	2·82 grammes	2·47 grammes.
Iodide of potassium 2·82	"	2·47 "
Absolute alcohol ...79·27	"	69·56 "
Water.....15·09	"	13·25 "
	100·00	87·75

2. *Specific Gravity.*—This is conveniently taken with the Westphal balance, or a stoppered specific gravity bottle with a mark on the neck. If the temperature is about 60° F., the specific gravity thus found may be corrected by the addition or subtraction of '0005 for each 1° F. above or below the normal temperature.

I have stated that 100 C.c. of the tincture should weigh 87·75 grammes; the specific gravity, therefore, should be '8775. The only published statement I know gives the theoretical value as '861 (Findlay, *Pharm. Journ.*, [3], xix., 472), but does not say how this erroneous value is found.

The specific gravity bottle was calibrated to hold 50 grammes of water at 60° F. May I here express the hope that the new Pharmacopœia will supplement the somewhat indefinite statement (page xix) "Specific gravities are to be taken at 60°" with the words, "and compared with distilled water at the same temperature."

3. *Iodine.*—This is readily determined by titrating 5 C.c. with sodium thiosulphate and starch. The reaction is so delicate that I prefer a solution weaker than that of the British Pharmacopœia, viz., one containing 13·7 grammes $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ per litre; each C.c. of this is equivalent to '007 iodine. I find that if commercial "hypo" is dissolved in hot water, filtered and cooled, the small crystals when dry are pure, and may be directly weighed out for the solution without the necessity of standardisation with iodine. A solu-

* As my pipettes are calibrated to contain a gramme of water for each C.c. marked on them, measured at 60° F., I here use the term "C.c." in that sense.

tion of iodine in rectified spirit was calculated to contain 4.96 grammes per 100 C.c., and 4.93 was twice found.

4. *Potassium Iodide*.—I thought that by evaporating the tincture to dryness on the water-bath all the iodine would be volatilised, and that the potassium iodide might be weighed; though most of the iodine is lost, heating to 150° C. does not remove it all, and at a higher temperature part of the iodide of potassium is volatilised.

If 5 C.c. of tincture is evaporated to dryness in a dish with a flat bottom, and small quantities of absolute alcohol are repeatedly evaporated on the residue, all the iodine is volatilised, and after drying in the water-oven the residue may be weighed. As a check the salt is dissolved in water and titrated with volumetric silver solution, using potassium chromate as an indicator.

A solution of potassium iodide in rectified spirit was calculated to contain 4.92 grammes per 100 C.c., and 4.92 was twice found by weighing, while titration gave 4.91 and 4.87. The volatilisation of iodine was also tested by taking a measured quantity of a rectified spirit solution of potassium iodide, adding a solution of iodine in rectified spirit, evaporating to dryness, treating with absolute alcohol, weighing, and titrating. Another equal quantity was evaporated to dryness without addition of iodine, weighed, and titrated as a check. The results were:—

Iodide only 1115 KI by weighing.. 1100 KI by titration.

Iodide and iodine.. 1135 KI by weighing.. 1115 KI by titration.

In making the aqueous solution of the residue I was puzzled by the presence of a pink colour, very similar to ferric sulphocyanide. Iron and iodine were both tested for with negative results; but as the colour is not obtained if porcelain dishes are used, and as the colour is fainter if no iodide is present, when the evaporation is much more rapid, and the iodine a shorter time in contact with the platinum, it appears probable that the pink colour is due to a minute quantity of iodide of platinum.

Neither weighing nor titration is absolutely accurate, as any other salt present is weighed as potassium iodide, and if any chloride is present the results of titration are too high; but for practical purposes either answers very well. I never find one-tenth per cent. difference between the two results. The figures given below are the means of the two methods.

I may point out the alterations which have taken place in the amount of potassium iodide ordered by the pharmacopœias. London, 1 oz.; British, 1864, $\frac{1}{4}$ oz.; 1885, $\frac{1}{2}$ oz. to each pint of spirit. The foreign pharmacopœias omit it altogether.

5. *Spirit*. (A) *Direct Determination*.—Allen ('Commercial Organic Analysis,' i., 112) writes: "Mere distillation is sufficient to separate the alcohol. . . . in tinctures of iodine, etc. . . . if they are first treated with soda in slight excess." I took 15 C.c. of a tincture of iodine, specific gravity .8792, calculated to contain 69.07 grammes absolute alcohol per 100 C.c., made slightly alkaline with soda and diluted to about 60 C.c., when a reaction took place that might have been anticipated, and iodoform was deposited; the liquid on heating became clear, but the distillate contained a notable amount of iodoform, rendering its specific gravity too high, and the quantity of absolute alcohol calculated therefrom too low, viz.: 65.65 grammes per 100 C.c. Experiment showed that the reaction took place, whatever was the order of mixing.

I then decolorised 15 C.c. of the same tincture with sodium thiosulphate, added a few drops of soda, diluted

to 60 C.c., distilled about 45 C.c., diluted to 50 C.c., weighed and calculated by the formula:—

$$\left\{ \begin{array}{l} \text{Grammes ab-} \\ \text{solute alcohol} \\ \text{per 100 C.c.} \end{array} \right\} = \left\{ \begin{array}{l} \text{Per cent. abso-} \\ \text{lute alcohol} \\ \text{in distillate} \end{array} \right\} \times \left\{ \begin{array}{l} \text{Weight} \\ \text{of} \\ \text{distillate} \end{array} \right\}$$

C.c. tincture taken.

The result was 69.67 against the theoretical 69.07; the error may be due to sulphur coming at the end of the process, and making the distillate slightly turbid.

(B). *Indirect Determination*.—If iodine or iodide of potassium is dissolved in spirit, the increase in its specific gravity is proportional to the weight dissolved; conversely, if the specific gravity of the tincture, the amount of iodine and potassium iodide present, and their influence on the specific gravity be known, the specific gravity of the spirit used for making the tincture may be calculated.

To determine the effect of iodine, 50 C.c. of rectified spirit was put in a stoppered specific gravity bottle with nine marks on the neck and weighed, from this the specific gravity of the spirit was found, about 2.5 grammes of iodine was added, the increase in weight being the exact amount. When the iodine was dissolved, the volume was estimated by means of the marks on the neck, and this divided into the total weight gave the specific gravity of the solution. A second value was obtained by cooling till the volume was exactly at a mark when the temperature was taken, and the volume at 60° F. calculated by means of the co-efficient of expansion. I thus found that one gramme iodine in 100 C.c. of spirit increased the original specific gravity by .0081, and similarly that one gramme potassium iodide increased the specific gravity by .0079. As there is so little difference in these figures, and as the iodine and the iodide ought to be present in equal quantities, no appreciable error will be introduced if the sum of the iodine and the iodide is multiplied by the mean of the two results, viz., .008. Therefore:—

$$\left\{ \begin{array}{l} \text{Sp. gr. of the} \\ \text{spirit used for} \\ \text{making the} \\ \text{tincture.} \end{array} \right\} = \left\{ \begin{array}{l} \text{Sp. gr. of the} \\ \text{tincture.} \end{array} \right\} - \left\{ \begin{array}{l} \text{I + KI in} \\ \text{grammes} \\ \text{per 100 C.c.} \\ \times .008. \end{array} \right\}$$

For example, a tincture of iodine had a specific gravity .878, and contained 2.30 grammes iodine and 2.34 grammes potassium iodide per 100 C.c. Then the specific gravity of the spirit used for making the tincture = .878 - [2.30 + 2.34 (.008)] = .841, while the specific gravity of the spirit actually used was .842.

(C). *Approximate Determination*.—Into a 500 grain graduated cylinder were successively put 50 fluid grains each of tincture and water, and 400 fluid grains of methylated ether (.717), and the mixture shaken. After standing the aqueous deposit measured 65 fluid grains. Reference to my table ('Year-Book of Pharmacy,' 1891, p. 256) showed this indicated 75.4 per cent. of absolute alcohol, while 78.5 per cent. was calculated to be present.

6. *Analysis of Samples*.—Table I. contains those samples which vary less than 10 per cent. from the theoretical standard, and have been probably more or less carefully prepared according to the Pharmacopœia. Two samples were bought from unqualified vendors.

Table II. contains carelessly made or adulterated tinctures; two of these (Nos. 19 and 20) were bought from unqualified sellers, the remainder (in both tables) from retail chemists.

I also give the averages, which agree remarkably closely with theory. No. 25 is omitted from the average of the specific gravities, because of its wide divergence from any of the others.

Table I.

Number.	Specific Gravity of		Grammes per 100 C.c.	
	Tincture.	Spirit used (calculated).	Iodine.	Potassium Iodide.
1	·8675	—	2·34	—
2	·8810	—	2·41	—
3	·8835	—	2·59	—
4	·8855	—	2·68	—
5	·8775	·837	2·52	2·57
6	·8810	·838	2·66	2·69
7	·8805	·839	2·56	2·60
8	·8715	·831	2·35	2·75
9	·8705	·834	2·30	2·26
10	·8725	·836	2·31	2·23
11	·8735	·836	2·34	2·31
12	·8780	·840	2·39	2·38
13	·8775	·839	2·39	2·36
14	·8805	·840	2·58	2·63
15	·8805	·839	2·59	2·54
16	·8795	·839	2·54	2·53

Table II.

Number.	Specific Gravity of		Grammes per 100 C.c.	
	Tincture.	Spirit used (calculated).	Iodine.	Potassium Iodide.
17	·8805	—	3·06	—
18	·8790	—	2·85	—
19	·8825	—	2·80	—
20	·8725	—	1·95	—
21	·8835	·847	2·04	2·54
22	·8735	·840	2·75	1·51
23	·8645	·839	1·78	1·45
24	·8785	·840	2·74	2·08
25	·9560	·914	2·59	2·65
Theory	·8775	·838	2·47	2·47
Averages				
1-16	·8775	·837	2·47	2·48
1-24	·8772	·838	—	—
1-25	—	—	2·48	2·34

THE CALIBRATION OF PIPETTES.

BY J. F. LIVESSEGE, F.I.C.

It is, I believe, a not uncommon practice to accept pipettes as accurate without calibration, and as I have never seen any figures given of their actual contents as sold, the following results may be of interest.

Before calibration it is advisable to ascertain that the pipettes are free from grease; if present, it may be removed by half-filling the pipette with soda solution, and carefully heating the bulb with a spirit lamp, then thoroughly washing.

To obtain concordant results it is necessary to adopt a definite procedure in employing the pipette, for if it be allowed to drain one time, blown out another, and only allowed to run out a third time, the amounts of liquid delivered will not be the same.

The pipettes and a beaker of distilled water are put near the balance and allowed to attain the temperature of the room. A flask is tared, the temperature of the water noted, the pipette filled with water, the outside wiped, adjusted to the mark, allowed to run out into the flask, drained five seconds, the surface of the liquid touched with the pipette, and the flask of water weighed.

Proceeding in this way two determinations generally agree (irrespective of the sizes of the pipettes) to within a few milligrammes; in fact, in 60 per cent. of a number of determinations the difference was less than five milligrammes.

If the temperature of the water is not 15·5 C., it is corrected to that temperature by the following table, which is calculated from data given by Cassamajor (*Chemical News*, xxxv., 160 and 170).

Temperature C.	For each gramme or grain delivered subtract	Temperature C.	For each gramme or grain delivered add
11°	·00049	16°	·00007
11·5°	·00045	16·5°	·00015
12°	·00040	17°	·00023
12·5°	·00035	17·5°	·00032
13°	·00030	18°	·00040
13·5°	·00025	18·5°	·00049
14°	·00019	19°	·00058
14·5°	·00013	20°	·00067
15°	·00007	20·5°	·00077

As the British Pharmacopœia requires a grain measure to be the volume of one grain of water measured at 15·5 C., and as the fluid ounce is the volume of 437·5 grains of water at 16° 66 C., it will be seen that a fluid ounce is not exactly 437·5 grain measures, but a trifle (·07 grain) more. This difference will not therefore account for the errors of the following British pipettes:—

Mark.	Grains of water delivered at 15·5°.	Error.	
		Grains.	Per cent. of contents.
1 oz.	434·0	-3·6	·83
$\frac{1}{2}$ "	216·8	-1·9	·89
$\frac{1}{4}$ "	88·6	+1·1	1·2
$\frac{1}{10}$ "	44·5	+·8	1·8

With regard to metric pipettes, there is a certain amount of doubt as to the temperature at which a pipette is expected to deliver a gramme for each cubic centimetre marked on it. Thorpe advocates 4° C. (the strict C.c.), Dittmar 15° C., Sutton "16° C. or 60° F.," while Fresenius requires 17·5 C. For most purposes it does not matter at what temperature they are calculated, so long as they are concordant with each other, and with the burettes and flasks used with them.

The following are the mean results of the examination of a series of metric pipettes:—The 10 (b), 3, 2, and 1 C.c. pipettes had the bulb at the bottom, the $\frac{1}{2}$ C.c. had no bulb, and all the rest had the bulb in the middle of the stem.

The variation in the direction (+ or -) and percentage of error (0 to 8·8) shows that there is no uniform system among the makers of pipettes, or that they are sold at too low a price to be consistent.

I have taken one gramme measured at 15·5 C. as a standard cubic centimetre, as it is a convenient temperature for calibration, and as it is the standard temperature for volumetric measurements. If the term cubic centimetre, as thus applied, be objected to as not strictly accurate, the expression "fluid gramme" may be used as suggested by Dittmar.

Fresenius considers an error of one tenth per cent. of the contents allowable, and the errors of one third of them (those marked *) do not exceed this amount. Bearing in mind that the "fluid gramme" exceeds the cubic centimetre by one thousandth part, it will be

seen that about the same proportion is condemned if the true cubic centimetre is taken as the standard.

Mark.	Grammes of Water delivered at 15°·5 C.	Error.	
		Gramme.	P.c. of Contents.
*100 C.c.	100·011	+·011	·01
*50	49·996	-·004	·00
30	29·881	-·119	·40
25	24·941	-·059	·24
20 (a)	20·045	+·045	·22
(b)	19·914	-·086	·43
15 (a)	14·984	-·016	·11
(b)	15·000	0	0
10 (a)	9·869	-·131	1·31
(b)	9·990	-·010	·10
(c)	9·946	-·054	·54
5 (a)	4·963	-·037	·74
(b)	4·972	-·028	·58
* 3	2·998	-·002	·04
2	1·973	-·027	·13
* 1	1·001	+·001	·01
$\frac{1}{2}$	·456	-·044	8·8

In two cases the error exceeds 1 per cent., and in three more the error exceeds $\frac{1}{2}$ per cent. This is hardly satisfactory, and the pipettes require correction for practical use.

An approximate correction may be made by the formula $\lambda = \frac{C}{n^2}$, where λ = distance in Cm. of correct

mark from erroneous one. C = error in C.c. $n = 3·1416$ and r = half the internal diameter of the stem in Cm., or by adding water from a burette to the pipette when full to the mark. After the approximate correction they were calibrated, and a further alteration made if required. The following are the results after correction:—

Mark.	Grammes of water delivered at 15°·5 C.	Error.	
		Gramme.	Per cent. of contents.
30 C.c.	30·001	+·001	·00
25	24·999	-·001	·00
20 (a)	20·001	+·001	·00
(b)	19·999	-·001	·00
15 (a)	14·998	-·002	·02
(a)	9·997	-·003	·03
(c)	10·005	+·005	·05
5 (a)	5·005	+·005	·10
(b)	5·001	+·001	·02
2	2·003	+·003	·15
$\frac{1}{2}$	·506	+·006	1·2

EXTRACT OF INDIAN HEMP.

BY DAVID HOOPER.

The chief medicinal preparation of Indian hemp is that part of the cultivated female plant of *Cannabis sativa* known as ganja, and the most important pharmaceutical preparation of ganja is the spirituous extract. Dr. W. B. O'Shaughnessy was the first to draw attention to the use of this plant in European medicine, and published a pamphlet on the subject in Calcutta in the year 1839. The history and therapeutics of ganja were very fully treated in the "Bengal Dispensatory" of 1842, pp. 579-601. Indian hemp and its preparations were introduced into the British Pharmacopoeia of 1864 and 1867; before this, as far as I can ascertain, they were in the Dublin Pharmacopoeia. Indian hemp, with its extract

and tincture, was one of the few drugs that was allowed to pass into the Pharmacopoeia of 1885 without any criticism, an indication, probably, of its decreasing popularity. For some years past the subject of extractum cannabis indicæ, and the relative values of English and Indian extracts, has been on the Blue List of the Conference, but this year it has been omitted from the list of topics suggested for investigation. Before this drug takes a lower position in pharmacy than it at present occupies, I would venture to give my experience of the extracts of Indian hemp obtained from different sources, and compare them with extracts of English manufacture. My recent position of analyst to the Indian Hemp Drugs Commission has given me unprecedented opportunities of learning about the composition of Indian hemp. My remarks will have particular reference to the pharmacopoeial extract, a preparation which contains the active principle of hemp. A summary of nearly fifty literary references to the chemistry of the drug, and a discussion on the active principle, based on some experiments now being conducted, will be left for a future occasion.

Preparation of the Extract.—Commercial samples of ganja contain from 5 to 40 per cent. of seeds, or, properly speaking, fruits, and as the seeds yield 25 per cent. of oil largely soluble in alcohol, a spirituous extract would often contain a considerable quantity of fixed oil. In breaking up a sample of ganja the seeds that fall out should be rejected altogether. In all my analyses I removed as much seed as possible before the sample was reduced to coarse powder, and in this way resinous extracts of greater purity could be prepared.

Rectified spirit answered every purpose in extracting the different samples of ganja. In some cases where the resin was high, a stronger spirit was used as a solvent, but this did not effect the solution of a larger quantity of resin. Rectified spirit dissolved from the drug some water-soluble matters in addition to the resins, while absolute alcohol dissolved very little besides the resins. The following experiments will show the difference in the solvent power of spirit of different gravities on samples of ganja:—

	Rect. spirit extract.	Resins.	"Abs. alc." ('80) extract.	Resins.
1	20·9	19·4	19·7	19·3
2	16·8	14·3	15·3	14·5
3	16·3	13·9	14·2	14·0
4 (Bhang)... ..	10·4	9·3	9·8	9·5

Amount of Extract in Ganja Samples.—Like all other drugs, the amount of active principle, which is here gauged by the resin contents, varies greatly in different samples. Dr. O'Shaughnessy, of Calcutta, obtained 20 parts of resinous extract from 100 parts of ganja. The ganja used was no doubt that cultivated at Navgaon in Raphahi District, Bengal, and known all over the north of India for its uniform richness in resin and its active properties. Mr. Savory (*Pharm. Journ.*, August, 1843) seems to be the first English pharmacist who published his experience in making an extract of Indian hemp. By a very exhaustive process, consisting in macerating the ganja in spirit for a week, and then percolating with hot spirit, he obtained 12 ounces of extract from 4 pounds, or 18 $\frac{1}{2}$ per cent. Indian hemp is official in the United States, and the process for preparing the extract is very similar to that of the B.P. F. J. Lammer (*Am. Journ. Pharm.*, November, 1886), by following the directions of the U.S.P., obtained 16·66 per cent. of finished extract.

In the following table are recorded some of the results of my examination of selected samples of ganja from various parts of India. The first column gives the percentage of rectified spirit extract evaporated to absolute dryness and calculated on the air-dried

sample of ganja. The percentages of extract range from 14.5 in the Bijapur specimen to 31.0 in that from the Kistna district of Madras. The Bengal samples are all very high, and are, in fact, different preparations of the same crop of hemp. The first kind is the "chur" ganja, or small matted pieces separated as much as possible from the stalks. The second kind is called "small flat twig," or ganja on small stalks. The third kind is "large flat twig," or ganja on large stalks. The fourth kind is known as "round ganja," prepared by rolling the fresh flowering and fruiting tops by the

drying and weighing the resinous residue left in the capsule. In the second column of the foregoing table will be found the weights of the washed spirituous extracts expressed in percentages on the air-dried ganjas. The third column shows the results of control estimations, which consisted in exhausting the ganjas directly with ether, then with ether, separating the resin from the spirit extract, and adding together the ether and spirit-soluble resins after drying and weighing. The chief constituent of the extract is a neutral resin of a brown colour and tough consistence, soluble in petroleum ether, benzol, ether, carbon bisulphide, and amylic and ethylic alcohol, insoluble in alkalies, and leaving no ash when ignited. This resin contains the active principle. A small quantity of resin acid, about $\frac{1}{2}$ per cent., is present in all the samples. This has been found by Dr. D. Prain, of Calcutta, to be physiologically inactive. Oil, fat, wax, and chlorophyll also enter into the composition of the spirituous extract insoluble in water.

The water-soluble substances removed from the extract are chemically interesting, although not yet proved to be medicinally active. An alkaloid is present in nearly all the fresh samples of ganja, it occurs only in traces in older specimens, and is altogether absent in extracts that have been kept for some years. Ammonia is often associated with this alkaloid in fresh hemp, it exists alone in older drugs, and is frequently found only in traces in old extracts. The alkaloid and ammonia are combined in the plant juices with one or more organic acids. One of these acids has the properties of citric acid, and another gives a yellow colour with lead acetate solution, and resembles an amorphous organic acid often found in plants. A substance is present in the extract which gives a purplish-black colour with ferric chloride, rapidly turning into a brown precipitate, and the precipitate dissolves in soda liquor with a red colour. Sugar has not to my knowledge been detected before in hemp drugs, but it is present in all the Madras ganjas examined, and in the leaves only from cultivated and wild plants from other districts. Traces of sugar were found in some of the Bengal and Bombay ganjas, nearly 5 per cent. was present in the sample from Ghazipur in the North-Western Provinces, and the Madras samples contained from 6 to 7 per cent. A glance at the fourth column in the table will show how the sugar increases the proportion of spirit extract soluble in water in these samples. The sugar was amorphous, and easily reduced Fehling's solution.

Examination of Commercial Extracts.—I have obtained three samples of Ext. cannabis indicæ made in England, and have examined them with the object of comparing them with the above extracts made from Indian material.

1. Sap-green colour, hard consistence, homogeneous under the microscope.
2. Sap-green colour with brown specks observable under the microscope, rather soft consistence.
3. Dull green colour and soft consistence. Microscope revealed the presence of brown specks, hairs, glands, cubical crystals (chloride potassium), and prisms (nitre).

	Moisture.	Ash.	Water-soluble extract.
1	4.20	1.52	6.25
2	6.65	2.21	12.51
3	7.00	3.70	16.66

The first sample was a portion of very old stock of extract; the second sample was also very ancient, some brown juice and mouldy particles were on the sides of the vessel in which it was kept; the third sample was said to be from a fresh consignment. From the microscopical and chemical examinations, we should consider the first sample to be the best, as

	Rectified sp't extract.	Washed spirit ext.	Ether & sp't sol. resins	P.c. of sp't. in ext. sol. in water.	Moisture in ganja.
Bengal, Navagon 1	23.6	21.2	21.8	10.1	9.0
" " " " " " " " 2	22.1	20.4	20.1	7.8	7.1
" " " " " " " " 3	21.1	19.5	18.6	7.6	6.7
" " " " " " " " 4	19.8	18.1	18.4	8.5	9.2
Bombay, Sholapur (exported) 20.9	19.4	20.1	7.1	7.1	
" Khandesh 18.0	16.5	16.8	8.3	7.4	
" Satara 17.8	16.6	16.6	7.0	8.9	
Independent State, Hyderabad 17.7	16.8	16.5	5.0	7.6	
N.W. Provinces, Basti 17.2	15.8	16.1	8.1	10.3	
Central Provinces, Nimar .. 16.7	16.0	15.6	10.2	8.4	
" " " " " " " " 2	15.1	13.7	14.4	9.2	8.6
Bombay, Ahmednagar 1	16.7	15.4	15.4	7.7	12.4
" " " " " " " " 2	16.2	15.2	14.9	6.1	11.6
" " " " " " " " 3	14.3	13.4	13.3	8.2	9.8
" " " " " " " " " " 16.8	14.3	14.3	14.8	8.3	
" " " " " " " " " " 14.8	14.0	13.9	5.4	8.4	
N.W. Provinces, Ghazipur .. 17.1	13.7	13.8	19.8	10.0	
Stnd 16.8	13.9	14.7	14.7	8.4	
Bombay, Surat 15.6	13.4	14.1	14.3	16.9	
" " " " " " " " " " 14.5	13.4	13.4	7.5	9.2	
Madras, Kistna Dist. 81.0	24.0	23.4	22.5	7.6	
" " " " " " " " " " 23.1	20.3	20.1	25.9	9.8	
" " " " " " " " " " 23.7	18.0	17.6	34.0	10.3	
" " " " " " " " " " 21.6	17.0	17.3	31.3	8.2	
" " " " " " " " " " 24.1	15.9	16.1	34.0	9.7	
" " " " " " " " " " 19.4	13.0	13.2	32.9	7.9	

hands or feet until they assume the shape of unfinished cigars. The ganja prepared in Sholapur is the best in the Bombay Presidency, although the exported product is much richer than that purchased locally. The samples from Ahmednagar were classified according to the price per maund, No. 1 and No. 3 realising the highest and lowest price respectively. It will be seen that the spirit extracts and resin contents accord with the market value of these samples. The examination of ganjas from different parts of India shows that, as far as the amount of resins is concerned, the samples from Eastern Bengal do not stand alone in their excellence. Dr. Watt, in 1886 and 1887 (*Pharm. Journ.*, [3], xvii., pp. 415 and 825), pointed out the difference in the duty imposed on Bengal ganja compared with that of Bombay and Madras, and suggested that the Bengal ganja only should be used in the manufacture of the extract. He also concluded that the reputation of the extract had declined in Europe, because it was being made from inferior hemp. Unless there is proved to be a very great variation in physiological action of the extract from Bengal, and that from other places, no drug dealer would think of paying ten times the price for a similar article, merely for the sake of its name, or because it yields a little more resin. With regard to the Madras samples, those from Ootacamund, Bangalore, Tanjore, and Madras City were from one cultivating and manufacturing centre in the Javadi Hills in North Arcot. The figures attached to these samples show the absence of that uniformity met with in the analysis of the kinds of Bengal ganja.

Composition of the Extract.—Each sample of extract of Indian hemp yields a certain amount of substances soluble in water. This amount can be determined by washing the extract with small quantities of hot water until nothing more is dissolved, and then

it yields the largest proportion of pure resins, and the third sample the worst. It would seem that the ash bears a certain ratio to the water-soluble substances, and is traceable to the saline constituents of the plant. Manganese is present in the ash of Indian hemp grown in different localities, and was found in the ash of the extracts. On igniting the aqueous extract obtained from the third sample, deflagration ensued, owing to the potassium nitrate present. Nitre has been found in Indian hemp by Messrs. T. and H. Smith (*Pharm. Journ.*, April 18, 1874). Its presence in the spirit of wine extract was accounted for by the supposition that other bodies were present to aid its solution.

After observing the dull olive-green colour of the extracts obtained from a large number of ganjas, I could not help noticing the very bright green tint of the commercial extracts when spread out on glass dishes, and I was not surprised to find copper in each sample. When the extracts were burnt in a platinum dish the copper present communicated a green colour to the flame, and the ash of each extract when dissolved in nitric acid and the solution saturated with ammonia resulted in a deep blue solution. The presence of this metal in manufactured extracts has been pointed out by different chemists, and it has been shown by Dr. Squibb and Mr. H. MacLagan (*Pharm. Journ.*, Oct. 18, 1884) that its contamination of the extract cannot be prevented when copper evaporating pans are used. In face of these experiments, I was amazed to find that in a paper published in the *Pharm. Zeitung (Chem. and Drug.)*, June 9, 1894, p. 802) a firm of manufacturing pharmacists has tried to attribute the copper found in extracts to its presence in the drugs themselves. I have examined the ash of bhang and ganja and have not discovered copper, but the amount of this metal in the extracts is decidedly higher than that shown in the paper (24 milligrammes per kilo.).

Ganjas always lose their strength when kept for some time, and many dealers in India obtain new supplies annually, and always consider the drug worthless after being kept three years. This is a matter worthy of consideration in England with reference to the extract, and the failure of the action of the drug owing to the decomposition of its active principle is probably the cause of its downfall in medical estimation.

Patent Office Business.

PATENTS FOR MEDICINAL PREPARATIONS.

Complete Specifications Accepted.

No. 9725.—August 11, 1894.—James Taylor and John Taylor, both of 4, Bank Street, Alexandria, N.B. A salve for sores, composed approximately as follows:—aqua fortis, 3 ounces; quicksilver, 1 ounce; lard, 18 ounces; carbolic oil, 18 ounces.

No. 12,432.—July 28, 1894.—Patrick Richard Reid, of 97, Upper Georges Street, Kingstown, Ireland. A new medicinal compound for the treatment and cure of whooping cough, composed approximately as follows:—sulphate of quinine, 18 grains; hydrobromic acid, 30 drops; hydriodate of potash, 18 grains; spirit of chloroform, 3 drachms; simple syrup, 3 ounces; liquor of red poppies, 2 scruples; pure water, to 6 ounces.

No. 13,446.—August 11, 1894.—Oscar Tropowitz, of Lookstetter Weg 96, Hamburg-Elmsbütten Germany. The production of siccative or drying ointments by emulsion of vegetable or animal fats or mineral oil with neutral or alkaline solutions of casein.

Provincial Transactions.

BRIGHTON ASSOCIATION OF PHARMACY.

The members of the Brighton Association of Pharmacy and their friends spent a most enjoyable day in the country on Tuesday, September 11, travelling to Hastings by rail, and driving to the ancient and picturesque towns of Rye and Winchelsea. The party included ladies as well as gentlemen, and numbered about sixty. At Winchelsea the party alighted for a few minutes at the picturesque residence of Mr. William Martindale, ex-Mayor of Winchelsea, and a chemist of long standing in London. Here the greatest hospitality was shown towards the visitors, who were regaled with refreshments. At the George Hotel, Rye, luncheon was taken, Mr. W. H. Gibson, F.C.S., President of the Association, making a most genial chairman.

At the conclusion of the repast the health of "The Queen and the rest of the Royal Family" was heartily drunk. The Chairman then asked the company to drink the health of Mr. Martindale, to whom he fittingly alluded as their guest, their guide, and their friend; as one who had attained a high position in their profession, sitting as he does on the Council of the Pharmaceutical Society, and who was admired by all who knew him. The rich mellow tone of his north country voice cheered the heart, and he wished him and his wife and family, as he was sure they all did, good health and long life. The toast was enthusiastically drunk, and Mr. Martindale suitably responded, drawing a humorous contrast between the invasion of the towns of Winchelsea and Rye by the French, centuries ago, and that by the members of the Brighton Association of Pharmacy that day, observing that theirs was a peaceable invasion, despite the fact that they had amongst them a "Savage." In conclusion, he said he was sure they would find much to interest them in the district.

After luncheon, the party visited the Town Hall and other places of interest, and shortly after five o'clock drove back to Winchelsea, where, at the New Inn, tea was provided. The party arrived at Brighton about half-past ten, having spent a most enjoyable day. The outing was the first that the Association has ventured upon, and considering the great success attending it, there is no doubt it will become an annual affair. The success on this occasion was mainly attributable to the indefatigable energy of the genial hon. sec., Mr. W. W. Savage.

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

POISONED BY CARBOLIC ACID.

Dr. G. Danford Thomas held an inquest on September 13 on the body of Joseph Lomas, aged 3 years, the son of a cabdriver, of 11, Ann Street, Clerkenwell, who died the previous Monday from the effects of carbolic acid poisoning. The poison had been obtained in the crude state from the Clerkenwell Vestry Hall for disinfecting purposes by a Mrs. Roberts, who lived in the same house. Some of it was subsequently placed in an unlabelled ginger-beer bottle, which was left on the landing. The little boy, who had followed his mother out of the room, took up the bottle and drank some of the contents. He died shortly afterwards. The coroner called attention to the indiscriminate sale of deadly poisons which still went on,

despite the petition of the Pharmaceutical Society to the Privy Council to include carbolic acid with other poisons in the schedule of the Poisons Act. The verdict was "Death from misadventure."—*Morning*.

POLICE PROCEEDINGS UNDER THE PHARMACY ACT, SECTION XVII.

PENALTY FOR NOT REGISTERING SALE OF POISON.

At the Over Petty Sessions on Monday, September 10, before Mr. R. Wilbraham, Mr. C. Threlfall, Captain Wilbraham, and Mr. George Garfit, Thomas Pickering, chemist and druggist, High Street, Over, was summoned for that on July 16 he did sell to Jane Finney, of Over, single woman, a certain poison (strychnine) within the meaning of the Pharmacy Act, 1868, and unlawfully did not before delivering the poison make or cause to be made an entry in a book kept for that purpose, stating the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it was stated by the purchaser to be required, with the signature of Jane Finney thereto affixed.

Sergeant Gunn stated that on Monday, July 16, he called at Mr. Pickering's, and asked him what he had sold to Jane Finney. He said "A pennyworth of turpentine." Witness asked, "Nothing else?" and he replied "No." He asked him if he had sold her any pills, and he replied that he had not. On the 17th he (witness) again called, and defendant still maintained he had sold her nothing but the turpentine, and produced his register, in which no entry had been made. On Wednesday, the 18th, defendant called at the police station, and said he wanted to see witness. He then said, "I have sold Jane Finney one packet of vermin powder, and I did not make an entry in my register of it." Jane Finney purchased this on the Monday, between five and six o'clock. The packet contained strychnine. Witness purchased a packet from Mr. Pickering on Monday, August 3. He saw it was the same material as was supplied to Jane Finney. It was made up into a packet, and sold to him. The powder was not ready made up. Defendant told him there was strychnine in it, and entered it in the register. He paid 3s. for this packet. He purchased this for the information of the chief constable. The person to whom defendant supplied the powder had died. An inquest was held, and the verdict returned was to the effect that Jane Finney died from strychnine poisoning.

Mr. Pickering, in his statement to the bench, said that, so far as he knew, the law to supply no vermin powder without registering it was only just recently put into force. There were several well-known vermin-killers and dips which contained a large quantity of arsenic, which he understood could be obtained with very little difficulty. He had never sold vermin powder to a stranger in his life, and what he had sold he sold with great caution. No one had suffered more—not even Finney's father—than he had done respecting this case. He regretted it very much. People who were not chemists could break this law, and sell compounds containing poison, yet he believed they were not proceeded against. He only supplied this powder to people he knew, people in whom he had the utmost confidence. He never for one moment dreamed this thing would happen.

Mr. Cooke said the law applied to everyone the same.

The Chairman said no doubt this little negligence on his part had caused defendant great distress, and he hoped now that he knew what the law was he would be more cautious. They really could not pass it over, and they would inflict a penalty of 20s. and costs.—*Northwich Chronicle*.

Notes and Queries.

FILTRATION OF MILK.

[774.] A simple method of purifying milk from the grosser particles that are apt to find their way into it is suggested by Dr. Seibert, who finds that filtration through a layer of absorbent cotton, $\frac{1}{2}$ inch thick, shortens the time afterwards required for complete sterilisation, to a marked extent. The first tablespoonful or so of milk passing through the cotton is not used, as more bacilli pass through during the preliminary wetting than at any time afterwards. Subsequently, a quart of milk may be filtered in twelve to fifteen minutes. Children brought up on such filtered and afterwards sterilised milk are said to escape all gastro-intestinal disturbances (*Archiv der Päd.*, and *Am. Med.-Surg. Bulletin*).

FOOD FOR INFANTS.

[775.] Dr. Oppenheim recommends the following process for preparing food for infants:—Mix a teaspoonful of flour and half a cupful of cold water, add twelve ounces of boiling water, and boil for ten minutes. Next add twelve ounces of cold water and half a teaspoonful of malt extract, allow to stand for fifteen minutes to let the diastase act upon the starch boil again for fifteen minutes, then strain and add to an equal quantity of fresh milk (*N. Y. Med. Journ.*, and *Am. Med.-Surg. Bulletin*).

CRISTALLINE.

[776.] This preparation was described in the Journal some time ago (vol. liii., p. 442) as a kind of collodion in which methylic alcohol is employed as the solvent of the nitro-cellulose. A formula for elastic crystalline is given by M. Phillips, as follows:—crystalline, 20 Gm.; castor oil, 5 Gm.; Canada balsam, 10 Gm. An excellent white varnish for medicinal purposes is said to result on mixing the following:—crystalline, 30 Gm.; castor oil, 4 gm.; zinc oxide, 8 Gm. (*Rev. scient.*, and *Bull. de Pharm. de Bordeaux*).

PICET GAS.

[777.] This is the name applied to a mixture of carbonic and sulphurous anhydrides in the liquid state in equal parts by weight. It is supplied in metal cylinders and used for antiseptic and disinfecting purposes. In the *Journal de pharmacie d'Anvers*, for September, are detailed the results of a number of experiments with the mixture upon bacteria, but it would appear that as good results can be obtained, much more economically, by the simple combustion of sulphur.

PHOSPHATED EMULSION OF COD LIVER OIL.

[778.] The following formula for this preparation is recommended by M. Marfan, the product being described as palatable and perfectly tolerated:—Tragacanth, 5 Gm.; solution of calcium lacto-phosphate (5 per cent.), 150 Gm.; syrup of calcium lacto-phosphate (5 per cent.), 350 Gm.; cod liver oil, 500 Gm.; tincture of citron, 20 Gm. The tincture of citron of the French Codex is made from the fresh peel, one part to two of alcohol at 80° B. (*Lyon Médicale* and *Moniteur*).

Obituary.

Notice has been received of the death of the following:—

On July 23, John James Fisher, Pharmaceutical Chemist, Carlisle. (Aged 68). Mr. Fisher had been a Member of the Pharmaceutical Society since 1869.

On September 6, William Taylor, Chemist and Druggist, Bridlington. (Aged 71.)

On September 7, Charles Jackson, Chemist and Druggist, Fulham. (Aged 67.)

On September 8, Henry William Haydon, Chemist and Druggist, Weston-super-Mare. (Aged 76.)

On September 11, James Macfarlane, Chemist and Druggist, Glasgow. (Aged 49.)

On September 12, William Ashton, Pharmaceutical Chemist, Southport. (Aged 64.)

On September 14, William Oakland, Chemist and Druggist, Nottingham. (Aged 76.)

Correspondence.

REVISION OF THE BRITISH PHARMACOPOEIA.

Sir,—Mr. E. C. Angel, in the *Pharmaceutical Journal* of the 8th inst., was good enough to refer Mr. J. C. Hyslop and others to my paper on the preparation of ointments. Since the paper in question appeared (April 14), several correspondents have written in approval after trial of the methods there suggested. In the *Journal* for September 15, Mr. Hyslop, in reply to Mr. Angel's letter, says he had read my paper, but having reason to disagree with almost every one of the statements therein, he thought it best to take no further notice of it. This is pretty hard on my paper. However, as I said when I read the paper, it was with diffidence that I submitted my suggestions, because, although based on results obtained by careful experiment, they were contrary to accepted methods, and I have been quite prepared for adverse criticism. I am only sorry that Mr. Hyslop's criticism is not based on actual trial of the methods instead of on his "having reason to disagree with my statements." It is hardly necessary for me to say that boric ointment is not of a sort to be made by my method. In this connection I think Mr. Hyslop scarcely apprehends what is meant by aeration when he says he saw no signs of it in the ointment after stirring till cold in a saucer. I confess I do not see how it could fail to be very well aerated under the circumstances. Let me ask Mr. Hyslop to prepare a sample of resin ointment by his formula (*Pharm. Journ.*, August 25) and method, and a sample by the same formula, but allowed to cool in the manner suggested in my paper, then favour the readers of the *Journal* with his opinion of the comparative pharmaceutical merits of the two ointments. My desire is to get at the best methods, and not to push a fad of my own, and I should be glad if some of those who desire to improve the Pharmacopoeia would at least give the methods suggested in my paper a trial, in preparing the ointments for which they appear to be applicable.

Edinburgh.

PETER BOA.

Sir,—In reference to the notes on ung. ac. boric. and ung. ac. carbolic., made by Messrs. Hyslop and Clower, I beg to suggest that a small quantity of glycerin, about $\frac{1}{2}$ iv. to $\frac{3}{4}$ iv. of the present ingredients ordered, be added. With this addition, and prepared by means of a water-bath, perfect ointments are obtained, and are much preferred to the ointments made without the glycerin. Samples of the ointments here forwarded have been made as above, and taken from my stock.

Croydon.

H. LONG.

. The specimens of boric and carbolic acid ointments sent are of very satisfactory consistence.—[*Ed. Pharm. Journ.*]

EMPLASTRUM CANTHARIDIS, P.B.

Sir,—In reply to Mr. Mason, I suggest lack of time as a possible cause of failure. If practicable, I always inquire if the doctor has ordered the blister to be applied for any particular length of time, and, in the absence of such instructions, recommend seven or eight hours. More than once, in the absence of this advice, the blister would have had "about half-an-hour" in which to act, and of course would have failed. Blisters are usually spread on adhesive plaster, leaving a good margin to keep them in position.

Northampton.

J. CLOWER.

Answers to Correspondents, etc.

David S. Robertson.—Please read the concluding paragraph of editorial article on page 221 last week, also the first note on page 185 (August 18). All information sent in response to the latter, and complying with the conditions laid down last week, was duly utilised. We were dealing with education during apprenticeship, and records of "passes" do not interest us.

J. H. Hart.—Thanks for your suggestion. The matter you refer to is already under consideration.

"Clifford."—*Diplotaxis babingtonii* and *Erigeron acris*.

Books, etc., received.

THIRTY-EIGHTH ANNUAL REPORT OF THE BOARD OF WORKS FOR THE WANDSWORTH DISTRICT, 1894. Pp. 208. London: Batten and Davies. From the Board.

CITY AND GUILDS OF LONDON INSTITUTE. PROGRAMME OF TECHNOLOGICAL EXAMINATIONS. Pp. 169. 10d. London: Whittaker and Co. From the Honorary Secretary.

STAMMERING, STUTTERING, ETC. By W. ABBOTTS, M.D. Pp. 62. 1s. London: The Savoy Press. From the Publishers.

GRIFFIN'S CHEMICAL HANDICRAFT. Pp. 388. 2s. 6d. London: John J. Griffin and Sons, Ltd. From the Publishers.

DESCRIPTIVE CATALOGUE OF ESSENTIAL OILS. By F. B. POWER, Ph.G., Ph.D. Pp. i.-v., 1 to 96. New York: Fritzsche Bros. From the Publishers.

PRESCRIBING AND TREATMENT FOR INFANTS AND CHILDREN. By PHILIP E. MUSKETT. Third Edition. Pp. i.-xii., 1 to 384. 6s. 6d. Edinburgh and London: Young J. Pentland. From the Publisher.

WILLIAMS AND NORRIS'S MONTHLY LIST OF NEW BOOKS PUBLISHED IN ENGLAND AND ABROAD. August. From the Publishers.

Notices to Contributors.

. Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., before noon on Wednesday, if publication be desired in the next issue of the *Journal*; though this cannot always be guaranteed.

Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

All scientific and proper names should be written with extra care, those of plants and animals being underlined, and generic names alone commenced with capital letters.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Hallaway, Hill, Newholme, Parry-Owen, Woodgar.

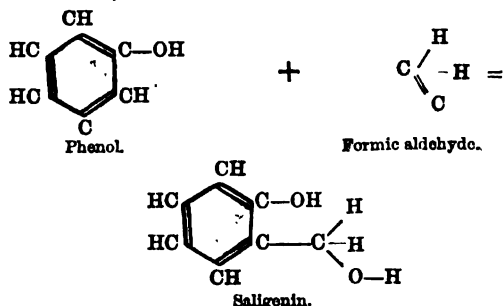
"THE MONTH."

Spasmodin or Sphaecelotoxin. In the exhibition connected with the International Medical Congress at Rome, a product obtained from ergot was shown under this name by Böhringer and Söhne, of Waldhof. It is a yellow, amorphous powder, insoluble in water, dilute acids, or petroleum ether, but soluble in alcohol or benzol, and very readily soluble in ether. Its activity was stated to be very great in doses of four to eight centigrammes. In a recent report of Messrs. Gehe and Co., reference to this product is made, and the opinion is expressed that apart from the various galenical preparations of ergot, the differences in the chemical products obtained from the drug by chemists are chiefly due to differences in the material operated upon, inasmuch as the varying influence of the conditions of climate, growth, preservation, etc., affect the action of the fungus upon the albuminous constituents of the grain. The greater the degree of moisture of the ergotised grain, and the less carefully it is dried, the more powerful is this action. The fact that Keller found scarcely any ergotinine in ergot that was carefully collected and dried may be thus explicable, as well as the circumstances that some parcels contain only amorphous ergotinine while others contain it in a crystallisable condition—some being quite inert while others are highly poisonous. If the preparation of products from ergot is thus rendered uncertain, still further difficulties arise from their liability to alteration. Thus, for instance, the alcoholic solution of some kinds of ergotinine rapidly turns red, and after some time gives no alkaloid reaction. In the absence of any trustworthy chemical test of identity, physiological experiment is the only means available. Cornutine appears to be a product of the alteration of ergotinine. Sphaecelonic acid, again, has only been obtained in the form of a dark coloured resin, and as it is rendered immediately inert by contact with alkalies, all attempts at purification have been fruitless. In operating upon a large quantity of ergot, Messrs. Gehe and Co. have obtained a product presenting the characters attributed to spasmodin, and behaving as an acid. They offer to provide medical men with a supply for the purpose of testing its physiological action.

Hydroxylamine and its Decomposition. In a paper read before the British Association, Dr. L. de Bruyn stated that the distillation of free hydroxylamine should be conducted at low pressure, since the base is violently explosive. Explosion occurs spontaneously at about 130°, and if the substance be heated to 70° or 80° an explosion may occur, self-decomposition raising the temperature. Hydroxylamine is an endothermic compound, and can be transformed totally into gaseous products. Oxidising agents, such as potassium permanganate, chromic acid, etc., act violently with the free base. Metallic sodium acts similarly, producing a flame, and if ether be also added a white substance, NaONH_2 , is formed and explodes in contact with the air. The solvent properties of the free base almost equal those of water, and it can occupy the place of the water of hydration in salts. Though a strong

reducing agent, free hydroxylamine is itself reduced by means of zinc dust, ammonia and zinc oxide occurring as the result of a somewhat violent reaction (*Chem. News*, lxx., 111).

Synthesis of Saligenin. By the condensation of phenol and formic aldehyde, L. Lederer (*Münch. Med. Wochenschr.*, 1894, p. 619) has succeeded in producing saligenin, which may be regarded as phenol in which one hydrogen atom has been replaced by the methyl alcohol rest, CH_2OH :—



On the assumption that saligenin is the substance which acts when the glucoside salicin is administered and undergoes decomposition in the organism, it is supposed that it might be used medicinally with greater advantage and in proportionately smaller doses than salicin, which yields only 43 per cent. saligenin. The bitter taste of saligenin is very much less pronounced than that of salicin, and Lederer considers that owing to its relation to phenol, saligenin may also have some antiseptic properties. Products of analogous character are produced synthetically in the same way as saligenin by the condensation of formic aldehyde with the cresols, thymol, carvacrol, guaiacol, eugenol, etc., but the question whether these products have any practical value therapeutically has not yet been investigated.

Cadmium Salicylate. This salt is prepared by the action of salicylic acid upon cadmium hydrate or carbonate, or by precipitating barium salicylate with cadmium sulphate. When chemically pure it forms fine white tabular crystals which melt at 300°, and dissolve in 24 parts of water at 100°, 68 parts at 23°, and 90 parts at 0°. The compound is also soluble in alcohol and in ether, more freely when warm than cold; it is very soluble in warm glycerin, without precipitating on cooling, but is insoluble in chloroform or benzol. According to Cesaris, it possesses a much more energetic antiseptic action than the other salts of cadmium, and gives good results in the treatment of purulent ophthalmia and other disorders (*Boll. chim. farm. and Répertoire* [3], xvi., 431).

Production of Soda and Chlorine. The struggle between the Le Blanc and Solvay processes for the manufacture of alkali is now likely to be participated in by a third competitor for favour, and whilst the two older processes excel each other in the economical production of chlorine and soda respectively, the new electrolytic process originated by Mr. H. Y. Castner, of the Aluminium Company, Oldbury, Birmingham, seems likely to prove a dangerous rival in both respects. It is stated that recent experiments have resulted in the production

of solutions which on evaporation yielded a solid caustic of 99.5 per cent., whilst the gas produced contained 95 to 97 per cent. chlorine. The essential feature of the process appears to be the employment of a moving body of mercury, which completely separates the products of electrolysis, and takes the place of a diaphragm, the amalgam formed being decomposed as rapidly as it is formed. According to the *Times* report, which is not very clear, the cells employed are divided into three compartments, and are capable of being continuously rocked or tilted, so as to give the contained mercury a flowing motion from side to side. The two outer compartments contain the carbon anodes and the alkaline chloride solution; the middle one an iron cathode and the caustic solution. The saline solution is continuously circulated through the outside compartments and, after being electrolysed, is returned to saturators, where it is recharged with salt. The electric current liberates chlorine gas, and at the same time sodium amalgam is formed, and subsequently decomposed. The process is continuous, and it is said that the electrical efficiency is 88.9 per cent. No hypochlorites are produced, and the electro-motive force required for each cell is low. With thirty cells the daily output is stated to be 1200 lbs. of pure caustic soda and 1000 lbs. of chlorine, with an expenditure of 110 i.h.p.

Preservation of Sublimates Solutions. L. Vignon, continuing his work on this subject (see *Ph. J.*, [3], xxiv., 622), points out that the decomposition of sublimate solutions is principally due to alkaline substances in the water employed or the glass of which the recipients are formed, a limited quantity of such alkaline matter sufficing to cause the precipitation of a relatively considerable amount of mercury. On the other hand, hydrochloric acid and alkaline chlorides increase the stability of such solutions, the first by saturating the alkaline precipitants, and the chlorides by their solvent power. As the result of a series of experiments he finds that ammonium chloride prevents precipitation by ammonia or albuminoid matter in the water, but fails to prevent the action of soda or sodium carbonate. Sodium chloride, on the other hand, fails in the case of ammonia and soda, but prevents precipitation by sodium carbonate and albumin. By combining the chlorides of ammonium and sodium, therefore, precipitation by any of the substances mentioned is prevented as well as by hydrochloric acid. The two formulae recommended are as follows:—(1) Mercuric chloride, 1 Gm.; ammonium chloride, 20 Gm.; sodium chloride, 10 Gm.; distilled water, 1 litre. (2) Mercuric chloride, 1 Gm.; hydrochloric acid (at 22° Baumé), 1 C.c.; distilled water, 1 litre (*Journ. de Pharm. et de Chim.* [5], xxx., 111).

Tannigen. Dr. H. Meyer has applied the name "tannigen" to an acetylated compound of tannin. It is a greyish-yellow, tasteless, and inodorous powder, very slightly hygroscopic, insoluble in cold water, somewhat soluble in warm water, but dissolving readily in alkaline liquids, such as solutions of sodium phosphate, carbonate, or borate. When boiled with these solutions it is decomposed into cetic and gallic acids. It is recommended for use

in cases of chronic diarrhoea, its superiority to tannin depending upon the fact that it passes through the stomach unaltered, only exercising an astringent effect in the intestines, where it is decomposed by the alkaline fluids present. It may be given in doses of three to four grammes daily for a prolonged period, without causing any inconvenience (*Bull. com.*, viii., 373).

Tussol.

The preparation introduced under this name as a remedy for coughs is a saline compound of antipyrine and mandelic acid ($C_8H_7O_3$). It is stated to be very much more effectual than antipyrine. For children under one year the dose is from one-third of a grain to a grain and a half two or three times a day; for children over four years, seven grains several times in the day (*Pharm. Centr.*, xxv., 532).

Purity of Flour and Yeast.

M. Rondelet proposes to examine flour and yeast for mineral matters by a process akin to those employed in microbiology. A little of the suspected material is placed on a slide, and one or two drops of an aqueous solution of aniline and alcoholic fuchsine solution are then added, and followed by an equal quantity of tincture of iodine and distilled water. On applying a cover glass and examining, the cellulose appears reddish-brown and starchy matter black; but any mineral matter present will be yellowish, like the background of the preparation. The addition of a drop of water clears the preparation, crystals appearing with their normal tint and sharply defined. It is stated that in less than five minutes it is thus possible to decide whether a flour contains plaster, barium sulphate, china clay, etc. (*Journ. de pharm. d'Anvers*, l., 363).

Filtration of Water.

P. Miquel publishes the results of a series of experiments bearing upon the sterilisation of water by filtration, performed with a modified arrangement of the Chamberland bougie. The space between the bougie and its enclosing case was filled with coarse sand, and before the water was admitted it was passed through a cylinder, 0.10 M. long, which contained a layer of fine sand, 0.07 M. thick, and another of animal charcoal, 0.03 M. thick. The water was sterilised at 100° C. prior to the experiments, and for purposes of comparison a second Chamberland bougie was used in the ordinary way, the filtered products from the two being tested side by side. Whilst the filter enveloped in sand delivered water showing no trace of bacteria until the twelfth day, when 60 per C.c. were present, that passing through the other was found to contain 20 per C.c. on the second day, and the number increased rapidly subsequently. Again, whilst the flow of water from the naked bougie was reduced to half by the fifth day, that from the sand-enclosed one had increased on the fifteenth day to double what it was on the first (*Journ. de pharm. et de chim.*, [5], xxx., 219).

Ice Crystals on Plants.

J. C. Bay deals with the formation of ice crystals on the surface of plants, under certain conditions of weather and surroundings, and states that the conditions of the phenomenon are that the temperature in the soil surrounding the roots of the plant must be above zero, as also must be that of the central parts of the water-conducting tissues, and that the soil must be sufficiently charged with

water. The cold causes a contraction of the tissues, and diminishes turgescence and the permeability of the cell-walls to water. As the contents of the peripheral ends of the medullary rays freeze, expand, and are pressed forward, the stem splits at the point of least resistance, and the ice forms a layer covering the whole surface of the wound, the internal pressure supplying water which is drawn up by capillary forces. In many plants, however, splitting of the stem does not occur, and further investigation and explanation is required in such cases (*Bot. Gazette*, xix., 321).

A variety of this somewhat rare plant *Carissa* (var. *stolonifera*, F. M. Bailey) has been subjected to examination by Dr.

T. L. Bancroft, of Brisbane. He has extracted from the plant a crystalline principle which is very bitter, and is apparently a glucoside. The crystals are very soluble in water, less so in dilute spirit, slightly soluble in absolute alcohol, and insoluble in ether or chloroform. Strong sulphuric acid gives no coloration with the crystals, but ammonia gives a yellow colour. Auric chloride and tannin give a slight precipitate with the solution of the crystals, but mercuric chloride gives none, nor does potassium iodide of mercury. The crystals are deliquescent, and when exposed in a thin layer to the air for a few days they assume a green colour. They reduce an alkaline solution of cupric oxide. At first Dr. Bancroft suspected that this principle might be identical with ouabain, since the genus *Carissa* is closely allied to *Acokanthera*, and the alcoholic extract of the bark rapidly killed frogs when subcutaneously injected, the heart stopping in systole and the muscles being pale and paralysed. He now believes, however, that it is quite distinct chemically. Dr. Bancroft suggests that the allied species, *C. xylopicron*, which is used in Mauritius in diseases of the urinary organs, might be worth trial in Europe, the Brisbane plant being scarce.

An illustrated monograph of this genus has recently been published by Dr. Franchet in the *Nouvelles Archives du Museum*. *S. boivini*, H. Baill., *S. tholloni*, Franch., and *S. courmonti*, Sacleux, are remarkable for not having tailed appendages to the corolla lobes, which in the first-named species are quite obtuse, whilst in *S. barteri*, Franch., *S. congoensis*, Franch., they scarcely exceed $\frac{1}{2}$ inch; in *S. parviflorus*, Franch., and *S. amboensis*, Engl. and Pax, and *S. ogovensis*, Franch., they are about $1\frac{1}{2}$ inch, and in *S. bracteatus* they reach a length of nearly six inches. *S. tholloni* has the long-tailed anthers of the *rouspellia* section, and long tapering scales in the throat of the corolla, nearly equalling the lobes in length, and the other species present every gradation in the length and shape of the corolla scales and in the length of the awn of the seed, showing that the species, although exhibiting great variation in the shape and size of the flowers, form a closely connected series. Dr. Franchet points out the curious fact that there is a relation between the glabrous character of the seeds and the length of the tail or appendage which crowns the connective of the anthers. Guided by this relation, Dr. Franchet concludes that the only two African species thus furnished, viz., *S. gratus* and *S. tholloni*, are the sources of the smooth

strophanthus seed of the Gaboon. This monograph forms a most valuable addition to our knowledge of the genus, the species of which, as now enumerated, have reached the number of thirty-five.

Gordon Sharp and Hoseason have examined a number of specimens of this plant—the night-blooming *Cereus* (Cactaceæ)—but failed to find in them either glucoside or alkaloid. They have found, however, that the plant contains a series of resins, one or more of which are soluble in normal saline solutions, and such medicinal activity as it possesses is probably due to these. Pectin and gum are also present, together with a small amount of sugar. The resins are completely removed by absolute alcohol, almost wholly by absolute ether, less perfectly by chloroform or by rectified spirit. Pharmacological experiments, of which details are given, were performed with solutions of the pure resinous extract in normal saline solution (0.75 per cent.). The resins had little or no effect as compared with digitalis, and the result of the experiments appears to indicate that the plant is pharmacologically inert. At most it has some slight diuretic action (*Practitioner*, liii., 161.)

Drs. A. Macfadyen and F. R. Blaxall have made experiments with a view to studying the range of temperature at which it is possible for bacteria to grow. After inoculating agar-agar with garden soil, they found that an abundant growth of bacteria was obtained at the comparatively high temperature of 60°–65° C. To such organisms the term "thermophilic bacteria" is applied. They are widely distributed in nature, being found in faeces, sewage, Thames water and mud, surface soil, and soil at a depth of five feet. Dust from the streets invariably contains them, and they are also present in sea water. In fact, they may almost be termed ubiquitous. About twenty different forms of thermophilic bacilli have been isolated, all, with one exception, being spore-bearing organisms. They will not grow at or below blood heat. Some liquefied gelatin, others did not. A number of them curdled milk, and one converted starch into sugar. In broth and agar cultures a putrefactive decomposition took place, iodol and sulphuretted hydrogen being produced. The organisms also produced an active decomposition of meat and blood albumin, and several of them produced a fermentation of cellulose. They are said to exercise perfectly all the functions common to saprophytic organisms at 60° to 65° C., that is to say, at a temperature which is usually fatal to the life of cell protoplasm (*British Med. Journ.*, No. 1760, 644).

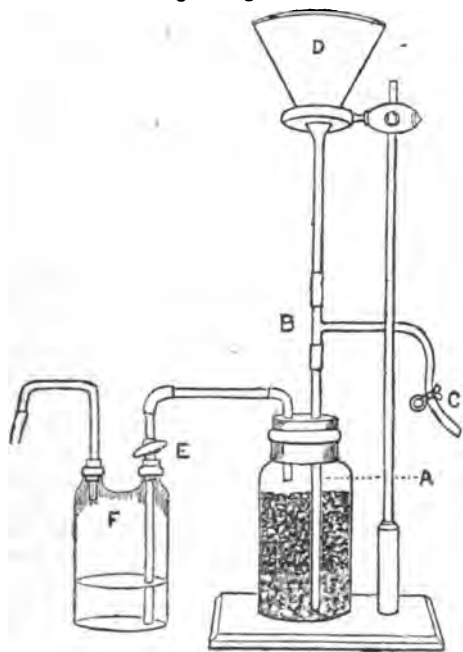
In a paper on the function of the Fat in the sweat-glands in man, Dr. P. G. Unna gives a summary of the researches on this subject, and devotes special attention to the secretion of fat. He is of opinion that it is irrefutable that the ordinary sweat-glands in man secrete fat, and shows that this can readily be proved by treating sections of skin or the sweat of the hand with osmic acid. The fat, though similar to that of the sebaceous glands, is described as differing from it in the same way that stearic and margaric acids differ from oleic acid (*Brit. Journ. Dermatology*, vi., 257).

A NEW SULPHURETTED HYDROGEN APPARATUS.*

BY J. F. LIVERSEEGE, F.I.C.

Most of the arrangements used for preparing sulphuretted hydrogen on a small scale suffer from either or both of the following disadvantages:— (1) The size of the hole through which the ferrous sulphide is introduced to the generator requires the sulphide to be crushed rather fine, with the result that there is a good deal of powder which gets into the acid bottle and continually generates the gas. (2) The tube between the acid bottle and the generator is small, and is frequently stopped up.

To avoid these troubles, some four years ago I devised the following arrangement:—



The generator, A, is a pint green glass wide-mouth bottle, with broken glass at the bottom an inch deep, and on it the lumps of sulphide; as the neck is $1\frac{1}{2}$ inch in diameter, fair sized pieces can be put in. This is closed gas-tight with a cork or rubber bung coated with paraffin wax; through it pass two glass tubes; one, just through the cork, is connected with a pint Woulff's bottle, F, for washing the gas; the other, $\frac{3}{4}$ th inch inside diameter, reaches nearly to the bottom of the generator, and is connected by means of a T-piece, B, with a large glass funnel, D. The other leg is closed by a rubber tube and pinchcock, C.

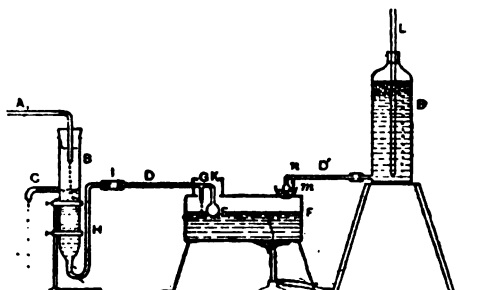
A little water is put in the funnel and commercial hydrochloric acid added. As the gas is generated, the liquid is forced up into the funnel, the layer of glass at the bottom preventing the sulphide soaking in the acid. A glass stopcock, E, is used for regulating the supply of the gas. When no more gas is required, the pinchcock, C, is removed, and the acid runs out through the side tube into a bottle for future use with more acid if necessary.

* Reprinted from the *Chemical News*.

A CONSTANT LEVEL APPARATUS.*

BY F. C. ROBINSON.

The following apparatus, which I have used for some time, may interest other chemists; hence the following sketch and description:—



B is a glass tube about 2.5 Cm. diameter, into which is passed the small tube A through a cork. A side tube C extends out about ten Cm., and is of much larger bore than A. Upon the lower end of B is sealed a small glass tube H, which is bent up until opposite C and then turned at right angles. Connected with H by a rubber tube is a tube D of equal bore and about twenty-five Cm. long. Upon the other end of D is a bulb E, five Cm. in diameter, turned down at right angles as shown in the cut. At the point G is a short tube, and just beyond it at K, the tube D is closed up by melting it together. F is a water-bath, through one of the openings of which E passes and floats upon the water. As the water rises in the bath, E, of course, floats higher and raises the tube D. The rubber connector holds D upright and allows it to move. If B is clamped so that C and D are upon a level, and the tap opened so that water flows into B through A, it will run out of both C and D, but of course D will soon float up so high that no water will run through it, and all will discharge at C. Now heat the bath, and as soon as evaporation has lowered D, sufficiently more water will run into the bath to take the place of that evaporated. A small stream of water flows constantly out at C and into the sink, but it need be very small indeed.

If the bulb E enters the bath through a place needed for evaporations, a small copper cylinder slightly larger than the opening, and having a narrow strip cut out of it for D to move up and down in, may be placed over it as in the cut. Of course, the float may be placed in a side tube soldered to the bath with water-connection to it. If one cannot make it of glass it could easily be constructed of metal by any tinman.

I find, also, that the same idea works admirably for constant feeding of a small platinum dish in evaporating large quantities of water or other liquids for analysis of residues. In such cases the tube D' is directly connected with a bottle holding several litres of water in the manner illustrated in the cut at the right. As D' falls through evaporation of the water in n, air enters through L and water drops out at n till D' rises so that n is higher than the bottom of L when it stops, and thus the level in n is constant. In this case the tube D' is very small, so that the bulb can be

* From the *Journal of the American Chemical Society*.

very small and still hold it up. In the one I use the bulb is only 1.5 Cm. in diameter, and the tube so close to it that it can be used in a crucible. It is very easy to clean the float from the slight residue clinging to it at the end.

I use the same apparatus for washing precipitates with a large amount of water, placing the bulb in the funnel on the surface of the wash-water.

SOME FALLACIES IN THE TESTING OF ESSENCE OF LEMON.*

BY ARTHUR A. BARRETT,
Pharmaceutical Chemist, Messina.

The object of this short note is to draw attention to the absolute worthlessness of the tests in common use for the examination of the purity of essence of lemon.

Until a few years ago almost every buyer contented himself with rubbing a little on his hand and smelling it, but repeated cases of essence "changing" into turpentine have forced upon them the desirability of relying on some chemical or physical test which should be more accurate.

As in so many other cases, Germany led the way, and a well-known firm advertised largely, recommending the use of the polarimeter as a test.

Although it is the object of this note to show how entirely useless is this test, yet it undoubtedly has done good work, and has prepared the way for the acceptance of a really scientific test which, in my opinion, is certain to be evolved during the next year or two.

During the last two years I have had a polarimeter in almost constant operation, and during the lemon season have often examined as many as twelve samples of essence a day with it.

The result has proved that genuine essence may differ in its optical activity between $+57^{\circ}$ and $+72^{\circ}$. As the addition of 5 per cent. of raw turpentine to genuine essence only makes a difference of 4 or 5 degrees in the rotation, it is clear that such a test is one that cannot be relied on.

As regards the limits above mentioned, it is only fair to say that they are exceptional, and in the case of the higher reading I cannot absolutely guarantee it, but $+69^{\circ}$ is not so uncommon. In the case of the essence with the low reading of $+57^{\circ}$, I was so altogether incredulous that I had some of the lemons brought to my works, and the essence extracted by my own employés, with the same result.

It is rather remarkable that the maturity or otherwise of the lemons does not materially affect the reading, but the district in which the lemons grow makes a great difference, as may be seen from the following table, which gives the average results obtained:—

Essence from Aei Reale and district...	$+61^{\circ}$.
Immediate vicinity of Messina	$+62^{\circ}$.
Giarre Giardini Mascali.....	$+63^{\circ}$ – 64° .
Barcellona (Sicily).....	$+66^{\circ}$ – 67° .

All the above measurements were made with a 100 Mm. tube and ordinary artificial light. Where great accuracy is required sodium light is desirable, but I did not find such a refinement necessary.

During the present year several Messina firms have invested in polariscopes, and being without scientific assistance some very curious mistakes have resulted.

In a letter to the American consul, published in the consular reports for May, 1894, by the Department of State at Washington, which, I may say, contains a valuable report on the Messina essence trade, one of them writes:—

"The requisites which modern science has found to distinguish the adulterated essence from the pure must be"—

Essence of lemon	
Specific weight 0.8587.....	15° C.
Opt. rotation $+62^{\circ}$	100 Mm. tube.
Index of refraction 1.476.....	20° C."

It is clear, therefore, that this firm must continue to buy its lemons from the same district, or by its own tests its essence may be rejected as adulterated.

The second objection to the general adoption of this test is the great assistance which it gives to fraud.

The remark is not original, but testing by the polarimeter is like mixing black and white, and when you see grey, thinking you have got purity.

In this case everything is ready to hand for the mixing process. Turpentine as used in Messina is always laevo-rotatory, whilst essence of sweet orange is powerfully dextro-rotatory, $+98^{\circ}$ being the average. It is, therefore, only the matter of a simple proportion sum to get a mixture indistinguishable polarimetrically from essence of lemon. I would state the exact proportions, but the object of this note is not to assist fraud but to expose it.

Shortly after the "boom" in polariscopes, which took place here at the beginning of this season, I was waited on by one of the local turpentine refiners, who told me that he had modified his "refining" process in this way by adding to it some very cheap distilled essence of orange, and it was now absolutely impossible to detect its presence. In fact, he declared that business being slack he had himself mixed essence, and sold it to a Messina dealer as genuine, after he had tested it with the *macchinetta*, as they call it here.

In any other country the avowal of such a proceeding would very likely lead to legal proceedings, but here it is only considered as being sharp business, the addition of turpentine to essence being considered to be almost sanctioned by long use.

The Refractometer.—During the current year another machine has been introduced here for the optical examination of essence. It is a pretty little machine, and only requires a drop of essence for a test. I commend its use by chemists examining oils generally, but for the examination of lemon I do not find it of any use. A few experiments showed me that of the two kinds of turpentine used here, ordinary French and the kind sold as "citronina," the one increased and the other diminished the reading, and the presence of 5 per cent. of either made only a difference of a fraction of a degree. Further, the instrument is extremely sensitive to changes of temperature. For the present, therefore, my instrument is relegated to the museum.

* Paper submitted at the Oxford meeting of the British Pharmaceutical Conference.

Perhaps the commonest test known is the specific gravity, and this is literally subject to change with every wind that blows. Just think of the enormous surface exposed to the air by a garden of lemons, and think that every drop of essence is pressed out by a man's fingers, runs over his hand, and is finally absorbed by the pores of a sponge. Then remember that in Sicily we get the "sirocco"—a hot wind from the Sahara—and you will not be surprised that evaporation at such times is considerable, with increase of specific gravity. On such occasions the yield of essence will fall five or even ten per cent., although every precaution may be taken in the workroom to exclude draughts.

The only remaining test in common use to which I need now refer is the test for mineral oil with alcohol or by evaporation on a piece of paper. Both of these tests are delicate and reliable.

I prefer to use flimsy, or the paper used for packing lemons, for making this test.

The various empirical tests—butyrate of copper, etc.—proposed from time to time, which may be found scattered up and down the periodical literature of the past, are not in common use, nor do they merit attention.

The direction in which progress is to be looked for now is chemical rather than physical—optical activity, refraction of light, and specific gravity have all been tried in turn, and though not without some value, leave much to desire. The determination of the citral naturally presents itself, but it is present in too variable a proportion to be useful as a test of genuineness. Its utility is rather as an assay. I may mention in passing the work of Messrs. Benedikt and Straube (*Monatsh. f. Chemie*, April, 1893). The recent memoirs have probably escaped me, owing to my being so far away from any scientific library.

What is wanted is to select some one constituent which is present in constant proportion and determine the amount of this.

Although in the commencement of this paper I looked forward to the near advent of a test which should be of some use, and have sketched out the lines on which it should run, yet chemical science will never be able to say more than this essence contains or does not contain an added adulterant, or this essence contains so much citral and that other so much.

The fine gradations of quality which make the essence of one maker preferred and the essence of another only saleable at a reduction are, and always will be, incapable of exact measurement.

Compare the fragrance of essence made with scientific care from fruit freshly gathered off the trees, and rapidly filtered and hermetically sealed down, with the essence made by the ignorant "trapetari." His fruit is stale, perhaps half rotten; he works in a hovel innocent of drainage; his sponges are old and never washed, full of a putrefying mass of lemon lice (*pidocehia*), bird droppings, and all sorts of dirt.

Is the essence he makes pure? Of course it is, if he puts nothing in. But is it worth the same as the other? Of course not.

The Proposed Imperial Pharmacopœia.

The Sub-committee of the Melbourne and Victoria branch appointed, in accordance with the request of the General Medical Council, to make suggestions with a view of assisting the Pharmacopœia Committee of the General Medical Council have now presented their report. Our Melbourne correspondent writes that the report has been conscientiously and carefully compiled, and contains a good deal of information which is bound to be of service to the Home Committee. The recommendations consist:—

1. In enumerating a large number of medicinal plants in the B.P. which grow in this colony equally as well as in the regions recognised as official, and in suggesting that, as far as Victoria is concerned, the present restriction as to growth and preparation should be removed.

2. To introduce the preparations of duboisina as official. The dose of duboisina would be $\frac{1}{16}$ to $\frac{1}{4}$ of a grain internally. In opthalmic application one or two drops of a solution four grains to an ounce.

3. To adopt the metric system of weights and measures, and falling this, that the strength of the liquors of the alkaloids revert to gr. j in 3ij.

4. That certain official formulæ for eucalyptus alone be used.

5. That a number of preparations and drugs at present unused in practice and unnecessary in therapeutics be omitted from the new pharmacopœia.

6. That adeps lanæ and paraffinum molle be altogether used as the bases for ointments, and that cacao butter be recognised as the sole basis for suppositories.

7. That the tests for chloroform, carbolic acid, and other drugs be improved, and that there be mentioned with the test the specific impurity of which it is destined to show the presence or absence.

8. That the standardisation of drugs, such as opium, be extended to other powerful drugs, such as aconite, digitalis, etc.

9. That a number of new drugs and preparations be made official, such as chloral cum camphora, some of the elixirs and syrup compounds, *β* naphthol, salicylate of bismuth, salol, resorcin, ichthyol, ethyl chloride, malt extract, a solution of copaiba, cubebs, and buchu, and others.

10. That the list of tabellæ for hypodermic use and the trochisci be increased.

11. That, like the decoctions, all the infusions be made up to a definite quantity.

12. That in certain drugs (tabulated) the maximal doses should be increased, and in others the minimum dose lessened, and other inconsistencies rectified.

13. That an excessive dose be not dispensed unless it has been intimated or attention otherwise drawn to it by the prescriber.—*British Medical Journal*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, SEPTEMBER 29, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

A FACULTY OF PHARMACY.

IN the course of the discussion on the proposal to admit associates to full membership of the Pharmaceutical Society, the question was raised as to the desirability of further distinguishing those who are now known as "pharmaceutical chemists," after passing the higher and voluntary examination of the Society. Of the various suggestions made, none is more attractive than that a degree should be conferred upon pharmacists, but the fact must not be lost sight of that a degree to be of any real value must be conferred by a body properly constituted for the purpose, i.e., by a university, and should not be granted until after the candidate has responded satisfactorily to the application of the most thorough tests as to capacity and training. That the Pharmaceutical Society of Great Britain is not in a position to confer degrees that would command a proper measure of respect should be obvious to everyone concerned, as also that the requirements of its "Major" examination are not alone sufficient to entitle successful candidates to the suggested distinction. It is generally understood in this country that the holder of a degree has received a good general education in all subjects in any way connected with those in which he has specially graduated, and this much cannot always or even often be said of the average "Major" man, although he may be all that is desired as a specialist.

As to how the necessities of the case may best be met, the impending re-organisation and extension of the University of London would seem to offer an opportunity which might well be taken advantage of. There is no valid reason why there should not be in this country, as abroad, a faculty of pharmacy connected with one of the great universities, and

that of London singles itself out as the one with which pharmacy could with the greatest propriety be affiliated. For, as the University of London now imposes no conditions as to how or where candidates for degrees have obtained the necessary instruction, whilst in the re-constituted body it is proposed in addition to make special arrangements for students who can produce evidence of having passed through a definite curriculum, so the degree in pharmacy might very properly be conferred—until such time as a compulsory pharmaceutical curriculum may be enforced—in the case of either "attached" or "unattached" students. To meet the requirements of the former the School of Pharmacy and any similar institutions subsequently organised might be raised to collegiate rank and affiliated with the University, after affording satisfactory proof that the means at their command and the proposed courses of study would suffice for the end in view. Of course, it is taken for granted that the existing arrangements as to the legal qualifying examination need not be interfered with, though it might be found desirable and necessary to raise the standard to that of the present "Major" examination, whilst considerably extending the scope of the "First" examination, and insisting upon three years being devoted to practical work in the pharmacy between the times of passing the "First" and qualifying examinations. Since, too, most students in pharmacy would probably like to feel free to proceed to the degree examination, it would perhaps be found desirable, sooner or later, to abolish the existing "First" examination entirely, and substitute for it the London Matriculation examination. To pass this, as is well known, candidates must show a competent knowledge of Latin, French or German, English, Elementary Mathematics, Mechanics, and Chemistry or Botany, etc.; all of which are subjects with which, even now, it is desirable and almost essential that pharmacists should be properly acquainted.

Assuming the undergraduate to have undergone the period of pupilage and obtained his legal qualification as a pharmacist, entitling him to perform all the functions and enjoy all the privileges now peculiar to "chemists and druggists," and "pharmaceutical chemists," it remains to consider what more should be expected of him to entitle him to the university degree. Not less than twelve months after qualifying as a pharmacist he should be entitled to present himself for an "Intermediate Scientific" examination, mainly practical, in mathematics, mechanics, general biology and elementary physiology, experimental physics, and chemistry. French or German should also be included, whichever had not been taken at matriculation. Finally, for the pass examination, open after another twelve months

interval, the candidate should be required to show a fully competent knowledge of experimental physics treated mathematically, advanced chemistry, particularly organic and analytical, and systematic, physiological, and histological botany, all the subjects being dealt with both theoretically and practically.

It is doubtful if any advocates for a degree in pharmacy have realised how much should be required of candidates for the degree, but it is certain that nothing less than suggested in the syllabus outlined above would properly suffice. If there were any consensus of opinion amongst British pharmacists that a degree in pharmacy was a desirable thing, to secure which they were prepared to greatly extend their educational course and perform a vastly increased amount of scientific work, there is little reason to doubt that the necessary arrangements could be made to give effect to such laudable intentions and desires. Unfortunately, however, the general tendency is too much in the direction of unduly limiting the preparatory professional work, and the desire for the honourable distinction suggested is usually associated with a decided disinclination to become fitted for it. Nothing like the proper amount of scientific training is undergone by the average pharmacist at present, and it would be extremely undesirable to attempt to base any project for a degree on existing foundations. Briefly, it may be stated that the candidate for a degree in pharmacy should, at the outset, be a fully qualified pharmacist, knowing much that the pharmacist is not now required to know. He should afterwards pass examinations equivalent in value to the intermediate and pass examinations of any degree now granted by the University of London. The possession of the degree would then distinguish its holder in the manner desired, and the degree itself would possess an absolute value, on account of the work done to obtain it, no less than the position of the body conferring it.

PATENTS IN PHARMACEUTICAL PREPARATIONS.

At the meeting of the Apotheker Verein, in Cassel, Professor BECKURTS drew attention to cases in which the claims of patentees involve interference with the pharmacist's right to carry out operations falling within the ordinary exercise of his art. As an instance of this kind he referred to the claims made by the manufacturers of lanolin that the intermixture of purified wool-fat with water constitutes an essential feature of their invention, and that consequently the kneading of any purified wool-fat with water amounts to an infringement of their patent rights. He pointed out that according to the specification of the patent lanolin is represented as presenting, under the microscope, the appearance of a homogeneous mass,

and that this statement is suggestive of the assertion that the combination of purified wool-fat and water termed "lanolin" is of a peculiar nature and something not previously known. That, however, he held to be by no means the case, and he further stated that the combination of wool-fat and water is, from a chemical and physical point of view, nothing different from the combination of fat and water in the well-known article called cold cream. The protection accorded by this patent to the incorporation of water with wool-fat is therefore an invasion of the pharmacist's right to exercise his art. Professor BECKURTS referred to the well-known fact that though fats and similar substances are not spontaneously miscible with water, it has long been known that they can be brought into mechanical intermixture by stirring them together. Microscopic examination shows that the mixture thus effected is not homogeneous, inasmuch as the particles of fat and those of water can be distinguished side by side. In this respect wool-fat is no exception. It does not any more than other kinds of fat or fatty substances form a homogeneous mixture with water. When olive oil, almond oil, or lard—all of which are used as the basis of ointments—are shaken or rubbed with water, the emulsion formed may be seen to consist of oil globules swimming in water. The whiteness of such an emulsion is a consequence of the total reflection of light. In the same manner by rubbing linseed oil, spermaceti, wax, or mixtures of these materials, with water, the emulsion produced is seen to consist of minute globules of fat surrounded by water. Wool-fat behaves exactly in the same manner as other kinds of fat, and is in no way an exception to the general rule. Lanolin, therefore, is not a new or peculiar product, and it is in no sense different from any of the other mixtures of fat and water which have been prepared from time immemorial as the bases of ointments in pharmaceutical laboratories. So long as pure anhydrous wool-fat was not obtainable, there was some reason for using the material produced by the patentees of lanolin, but now that pure wool-fat is obtainable commercially, Professor BECKURTS considers that the claim to patent right as regards the admixture of water with it for preparing a basis for ointments becomes an inappropriate obstruction which would interfere with the right of the pharmacist to perform a well known operation.

THE BRITISH PHARMACOPŒIA.

We are informed by the Registrar, acting on behalf of the President, of the General Medical Council, that the number of British dependencies from which communications have been received relating to the arrangements for the next issue of the British Pharmacopœia has been further

increased, reports having been received through the Colonial Office from the Governor of Hong Kong, the Board of Medical Officers appointed in Ceylon to report upon the subject, and the Governor of South Australia. The latter included replies from the Presidents of the South Australian Pharmacy Board, the Medical Board of South Australia, and the South Australian Branch of the British Medical Association. Through the Privy Council Office, a report has been received from the India Office of a Committee appointed in India to make suggestions in connection with the subject.

In these additional communications some new drugs and a few foreign species of British medicinal plants are proposed. Several new preparations are suggested, the omission of what are considered to be useless articles of the materia medica and useless components of old preparations is recommended, and a large number of amendments of existing formulæ are included, as well as a few adaptations of formulæ for suitable army and navy purposes. In all these communications, as in the former ones, local climatic conditions originate a desire for harder ointments and for non-drying extracts. Climate, however, varies so much in the different British possessions that some general permission to vary the proportions of hardening and softening components may have to be received instead of several slightly varying formulæ, or any one average formula. We understand that further replies are under consideration by the Government departments prior to transmission to the Medical Council. Details of the recommendations of the sub-committee of the Melbourne and Victoria branch of the British Medical Association are given at page 256.

SCHOOL OF PHARMACY.

As previously announced, the fifty-third session of the School of Pharmacy of the Pharmaceutical Society will be commenced on Wednesday next, October 3. The chair will be taken at the inaugural meeting at 3 p.m., by the President, Mr. MICHAEL CARTRIDGE, and the distribution of prizes to the successful students of the past session will then take place. Afterwards, the inaugural sessional address will be delivered by Mr. WALTER HILLS, Member of Council. At the close of the proceedings, in which all pharmaceutical students are invited to take part, the Society's House will be open for inspection by visitors.

ADULTERATED PHARMACEUTICAL PREPARATIONS.

At the Skipton Petty Sessions several persons have been convicted under the Food and Drugs Act of selling adulterated tincture of rhubarb, paregoric, etc., and subjected to heavy penalties. The defendants were not in any of the cases tried registered chemists and druggists; but these convictions will no doubt appear in the Local Government Report as indicating the extent to which

drugs and pharmaceutical preparations are adulterated, without any information as to the important fact that the defective articles were sold by persons who do not possess the requisite qualification to deal in articles of this kind. Attention has frequently been directed to this circumstance, and it has been pointed out that the indiscriminate record of such cases of adulteration casts unmerited discredit upon the legally recognised vendors of medicines.

CONGRESS AT VIENNA.

THE annual Congress of Naturalists and Physicians was opened at Vienna on Monday, in the presence of the Archduke REGNIER, Prince WINDISCHERÄTZ (the Prime Minister), and three other Ministers, and many of the highest Austrian Military and Civil functionaries. The attendance of members was very large, nearly two thousand five hundred tickets of membership having been taken. The inaugural address was delivered by Herr HOFRATH KERNER. It was mainly a survey of the progress made by the natural and medical sciences since the Congress at Vienna in 1832, and of the part Austria had played in this field during the past fifty years. The Minister of Public Instruction and the Burgomaster of Vienna afterwards welcomed the Congress to the Austrian capital, on behalf of the Government and the Municipality. The delivery of lectures and reading of papers were then proceeded with.

CLASSES IN BACTERIOLOGY.

THE new syllabus of the evening classes in bacteriology, conducted at King's College, shows that the course of instruction is still undergoing modification and extension. The class in general bacteriology will re-commence on October 15, and will be held on Monday evenings throughout the term, from 7 to 9 o'clock. The bacteriology of fermentation will be practically treated on Wednesdays, from 7 to 9 p.m., the class commencing October 17. Full particulars of these useful courses will be sent on application to Dr. R. J. HEWLETT, Bacteriological Laboratory, King's College, London.

EDUCATIONAL FACILITIES AT PLYMOUTH.

WE are asked to announce that the Technical Instruction Committee of the Borough of Plymouth has made arrangements at the Municipal School of Science and Technology to meet the requirements of pharmaceutical students in the district. The chemical and physical laboratories are well equipped, and provision is also made for the study of systematic and practical botany, zoology, and general biology. The materia medica class has the benefit of a well-arranged collection of specimens.

METHYLATED SPIRIT LICENCES.

RETAILERS of methylated spirit are reminded that the annual licences for the sale of this article, granted by the Inland Revenue authorities, are renewable on October 1.

GOVERNMENT APPOINTMENT.

WE are pleased to learn that Mr. JOSEPH HENRY MAIDEN, Curator of the Technological Museum, Sydney, and a Corresponding Member of the Pharmaceutical Society, has been appointed Superintendent of Technical Education under the Department of Public Instruction, Sydney.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The following is the programme of this Association for the half-session, October to December, 1894:—

- October 4.—Inaugural Address. By the President.
 October 11.—Musical and Social Evening.
 October 18.—Discussion: The Duties of the Pharmaceutical Society as an Educational Body. Opened by E. H. Gane.
 October 25.—Paper: "Chemical and Pharmaceutical Signs and Symbols." By T. Tickle.
 November 1.—Paper: "Sneezing." By Scanes Piper, M.A.
 November 8.—Paper: "Recent Advance in Photography." By E. W. Hill.
 November 15.—Annual Conversazione.
 November 22.—Paper: "Surgical Dressings." By E. White, B.Sc.
 November 29.—Short papers by members.
 December 6.—Discussion: Can we stop "Company" Pharmacy? Opened by H. B. Care.
 December 13.—Paper: "The Future of Pharmacy." By H. A. D. Jowett, B.Sc.
 December 20.—Musical and Social Evening.

The meetings are held at 103, Great Russell Street, W.C., at 8.30 p.m., the chair being taken at 9 o'clock precisely.

American Pharmaceutical Association.

A MICROSCOPICAL AND CHEMICAL EXAMINATION OF CLOVES.*

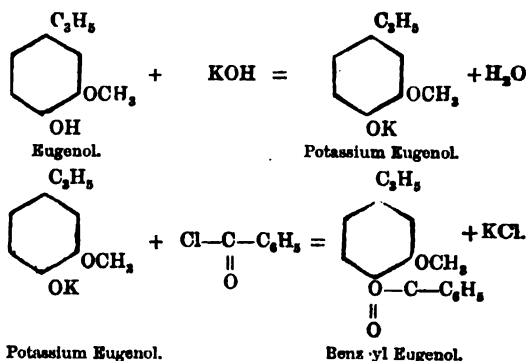
BY HENRY KREMER.

More than a year ago a sample of a spice was submitted to the author, an examination of which revealed the presence of a large quantity of starch. The question was then asked: "How much is there of this adulteration?" A quantitative answer was desired without a chemical analysis. This was the beginning of the present work, and very naturally the thought arose, is it possible to obtain quantitative as well as qualitative results with the microscope? The results are embodied in this paper—which is intended, however, merely as a preliminary paper—on the comparison of quantitative microscopical with chemical examinations, and it is hoped will reveal the possibilities of research in this direction. At the same time are given the results of analysis of some commercial samples of clove oil and cloves by Thoms' method (with perhaps a slight modification) of determining the eugenol in the form of a benzoyl compound.

Extraction of Oil from Cloves.—10 Gm. of the powder were mixed with 10 Gm. of dried calcium sulphate, wrapped in filter paper and extracted in a Soxhlet apparatus by means of petroleic ether. Some of the ether was recovered, and the remainder was siphoned off by means of a siphon and a suction of air. The oil thus obtained had a viscous appearance, and on the addition of alcohol about 0.16 per cent. of a white resinous compound separated, which on the filter assumed the form of a very fine gauze. To this filtered solution from 8 to 10 C.c. alcoholic potash solution (1 C.c. = 0.09856 KOH) was added. The alcohol was removed on a water-bath, and to the nearly dried mass from 2 to 2.5 C.c. of benzoyl chloride was added. The mixture, in a flask similar to that in which the extraction had been done, was stirred with a glass rod until the reaction was com-

plete. Water containing some KOH was then added, and the whole heated on a water-bath for a few minutes, then removed and placed in ice water, and when cooled the clear liquid decanted, and if there were any floating oily particles, these were removed in a separatory funnel by means of ether. This washing was continued three or four times, and finally the benzoyl eugenol was separated from the water by means of a separatory funnel with ether. The ether was evaporated off (assisted by siphoning the vapour and the use of the suction of air). The mass on cooling crystallised. These crystals were dissolved in 15 C.c. alcohol (90 per cent.), heated to solution, and re-crystallised by placing in ice water and shaking the flask repeatedly. The solution was decanted and filtered through a small filter from the crystals, and the latter simply washed with an additional 15 C.c. of alcohol (90 per cent.). The crystals in the flask with filter paper were dried at 100° C. and weighed.

- 1 Gm. eugenol requires .341 Gm. KOH.
 1 Gm. eugenol requires .693 benzoyl eugenol.
 5 C.c. alcohol (90 per cent.) will dissolve .110 Gm. benzoyl eugenol.



Thoms has worked out an algebraic formula for hastily calculating the results, which may be translated as follows:—

a = weight of benzoyl eugenol.
 b = weight of oil taken.
 c = + 0.110 Gm. for every 5 C.c. of alcohol used (being the weight of benzoyl eugenol dissolved in 90 per cent. alcohol).

x = per cent. of eugenol.

Molecular weight of eugenol = 164.

Molecular weight of benzoyl eugenol = 268.

Then:—

$$268 : 164 = (a + c) : \text{weight of eugenol.}$$

$$\text{Weight of eugenol} = \frac{164(a + c)}{268}$$

$$b : \frac{164(a + c)}{268} = 100 : x.$$

$$x = \frac{164(a + c) \cdot 100}{268b}$$

$$x = \frac{4100(a + c)}{67b}$$

The following results have been obtained by this method from the commercial samples of powdered cloves and clove oil:—

Powd. Cloves.	Per cent. of oil.	Per cent. Eugenol
No. 1	17.50	59.74.
" 2	17.75	60.45.
" 3*	12.75	66.16.

* This sample was determined by the microscope to contain powdered clove stems, although sold by a large house in New York as powdered cloves.

* Read at the forty-second annual meeting, 1894.

Clove Oil	Per cent. Eugenol.
No. 1.....	76.06.
" 2.....	78.12.
" 3.....	83.45.

Coming to the subject of quantitative microscopical analysis, while accurate results may be possible, so far only approximate figures have been obtained. These may not be without interest and value, and it seems probable that an analyst, who is able to use the microscope, may by a few moments' careful examination obtain evidences that will materially aid him in subsequent chemical analysis. Regarding the statements made by some that "the results of microscopical examination are not always uniform," I must refer them to the non-conformity in results of analytical chemists in organic and even inorganic analyses, unless by practice the individual masters the difficulties. And again it has been recently said, "that in the case of the deterioration of vegetable drugs through atmospheric influences or age, as well as in the adulteration of a genuine with inferior drugs, the difficulty of determining with the microscope the respective extent of change or adulteration is almost insuperable." This may seem to be so, and while chemical analysis is necessary, still there are many cases where the quantitative determination of admixtures and adulterations, if they are to be determined, can be effected only by means of the microscope.

It would not be a hard matter to prepare a lengthy paper on the difficulties attendant upon research in this direction. Was there anything more difficult a few years ago than the study of bacteria? Not until Koch devised a convenient and comparatively easy method for this kind of investigation did this department, which to-day is recognised as a branch in science, become so popular. Even the medical student of the first and second year is taught to recognise and diagnose the insignificant *Bacillus tuberculosus*.

As has been said before, this paper is but a preliminary one, and while I have been at work upon the subject for some time, the work has been done under rather disadvantageous circumstances, and it is presented at this meeting to elucidate a principle, and present the results of what may be an incomplete method, for your consideration. The method of procedure is as follows:—A measured quantity (about .200 Gm.) of substance is thoroughly mixed with a measured amount (2 or 3 C.c.) of water. One, two, or three drops formed on the finger of this mixture are placed in the slide and covered with a cover-glass. In the eye-piece of the microscope is slipped a piece of glass (corresponding to an ocular micrometer), containing 100 square Mm. By a little practice a slide may be prepared that is fairly uniform, or uniform places upon it may be selected. This being done, then a count is made of the number of starch grains, fibres, or characteristic tissue in the spurious substance, contained in 100 square Mm., and the same compared with a genuine sample. For instance, mixtures were made of genuine cloves with potato-starch, wheat-starch, cedar-wood, turmeric, and it was observed that quantitative relations by comparison do to some extent hold even in this crude way of procedure. In determining the oil a slightly different method was pursued.

I. A sample of pure potato-starch was examined and 100 (Mm.)² was found to contain (32+28+32+35) 127 starch grains. Another 100(Mm.)² contained (32+30+28+30) 120 starch grains.

II. A sample of powdered cloves admixed with 50 per cent. of potato-starch yielded the following results:—

(1) (14+15+12+15) 56 grains=45.34 per cent.
(2) (13+11+18+13) 55 " =44.53 "
(3) (17+16+16+13) 62 " =50.20 "

III. A sample containing 30 per cent. of potato-starch:—

(1) (10+10+11+11) 42 grains=34.00 per cent.
(2) (7+10+11+8) 36 " =29.14 "

IV. A sample containing 20 per cent. of potato-starch:—

(1) (7+8+7+8) 30 grains=24.29 per cent.
(2) (7+6+9+9) 31 " =25.10 "

V. A sample containing 10 per cent. potato-starch:—

(1) (4+2+3+2) 11=8.90 per cent.

VI. A sample of pure red cedar yielded the following:—

(1) (10+10+8+9) 37 fibres to 100 (Mm.) ² .

VII. Cloves containing 20 per cent. red cedar yielded:—

(1) 7=18.91 per cent.
(2) 9=24.35 "
(3) 8=21.60 "

VIII. Cloves containing 10 per cent. red cedar yielded:—

(1) 4 fibres=10.8 per cent.
(2) 3 " =8.10 "

All of the above results were obtained by using a $\frac{1}{4}$ -inch objective. In the examination of turmeric a $\frac{1}{8}$ -inch objective was used.

IX. Turmeric pure, using one part of water:—

(1) (11+11+6+5) 33 grains.
(2) (7+8+6+5) 26 "
Average $\times 2 = 118$ "

X. Cloves containing 10 per cent. turmeric, using 2 parts of water:—

(1) 10=8.47 per cent.
(2) 11=9.32 "
(3) 10=8.47 "

While the above results show a variance, and one that is not constant in any one direction, still they are of some encouragement. Hoping that the possibilities of this kind of research was not limited to mechanical admixtures, the author experimented with the view of obtaining quantitative results upon the oil contained in cloves. For this purpose a small extractor, graduated to a mark, was made out of a piece of glass tubing. This was filled to the mark with cloves and exhausted with ether, the whole operation requiring about one minute. The ether containing the oil was allowed to drop in a watch crystal containing a few drops of alcoholic KOH solution, the potassium eugenol forming at once and the ether evaporating. To the residue was then added a known quantity (2-3 C.c.) of water, the mixture thoroughly stirred, and a drop of the liquid collected on the finger and used on the slide. 25 (Mm.)² were examined and the number of (Mm.)²—approximately—filled with crystals were counted.

XI. Pure sample of cloves:—

(1) 9.
(2) 6.
(3) 9.
Average=8

XII. Sample containing 50 per cent. of cloves of original sample contained:—

(1) 4.
(2) 3.
(3) 4.
Average=11=45 per cent. oil.

Three commercial samples were examined, one that was said to contain much allspice. An examination based on the "port wine" cells of allspice yielded the following results:—

XIII. Genuine allspice sample yielded:—
(5+9+3+3)=20 "port wine" cells.

XIV. Commercial sample gave:—
(3+3+4+3)=13 "port wine" cells=65 per cent. allspice.

A sample supposed to contain a large amount of wheat-starch yielded a surprisingly small amount comparatively, as was shown conclusively on comparing with pure mixtures of wheat-starch and cloves.

XV. Pure sample of wheat-starch contained :—

(69+68+67+69) 273 grains.

XVI. Sample of cloves containing 25 per cent. of wheat-starch :—

(16+19+16+18) 69=25.28 per cent.

XVII. Sample of cloves containing 10 per cent. of wheat-starch :—

(13+9+7+10) 39 grains=14.2 per cent.

(9+7+9+8) 33 grains=12.0 per cent.

XVIII. Commercial samples, adulterated with wheat-starch :—

(1)	100(Mm.) ² =	18
(2)	"	= 24
(3)	"	= 28
(4)	"	= 24
	4)94	
	23.25	

The sample contained, therefore, 8.93 per cent. of wheat-starch, probably ten per cent.

XIX. Commercial sample with a slight clove odour. Under the microscope this revealed the presence of clove stems and starchy material. It yielded scarcely any potassium eugenol, but a green-coloured liquid to ether. This sample showed adulteration, and either an extraction of oil by distillation or loss of oil.

Anyone who has laboured with microscopical work for other than mere pleasure can readily comprehend the difficulties that must have been overcome by the author in this investigation thus far. And they who will attempt to corroborate these results or do original work in this direction must not be disappointed if results are not at once forthcoming. "Nature is taciturn, and one must wrench her secrets from her." But after these secrets are well obtained and the way discovered, the work is not so difficult.

The author hopes to elaborate upon the principles contained in this article, and that by similar methods, especially extraction and micro-chemical tests, the more important plant constituents even may be determined in a quantitative manner. Smaller squares than Mm. may be employed. Instead of tests being made upon a few milligrammes of material, several grammes should be used to obtain more uniform results. It is believed that by preparing carefully a series of powders with the adulterants, fairly accurate results may be obtained—certainly sufficient to determine approximately the extent of adulteration without recourse to elaborate and prolonged chemical analyses. By employing the most accurate methods of sampling in use in the assay laboratory, samples must be obtained that are representative. Enlargements by photomicrography, and subsequent cutting out and comparing by weight the tissues printed and the part remaining may be of service. Finally, much time must be yet devoted in ascertaining the real and permanent value of quantitative microscopical results to that of chemical results. It is hoped that many will pursue similar lines of research.

SCIENTIFIC SECTION.

Titles of Papers submitted at the Forty-second Annual Meeting.

1. "Saw Palmetto (*Sabal Serrulata*)," J. Marion Dixon.

2. "Examination of Preparations of Cod Liver Oil for Alkaloids of Cod Liver Oil." J. O. Schlotterbeck.

3. "Therapeutic Value of so-called Elegant Preparations of Cod Liver Oil." F. E. Stewart.

4. "Advance Sheets of an Analytical Companion to the U.S. Pharm." J. B. Nagelvoort.

5. "On Powdered Extracts." O. S. N. Hallberg.

6. "Notes on the Behaviour of Ferratin and Albuminate of Iron with Artificial Gastric Juices." J. O. Schlotterbeck and S. R. Boyce.

7. "Pharmaceutical Bacteriology." R. G. Eccles.

8. "A Critique upon Criticisms of the National Formulary." L. F. Stevens.

9. "The Opium Poppy in North Carolina." Gerald McCarthy, Botanist Exp. Agricultural Station.

10. "Rhus Toxicodendron." H. M. Whelpley.

11. "Some Pharmaceutical Uses of Acetone," and "The Solubility of Canada Balsam in Alcohol." J. E. Morrison.

12. Papers from the University of Michigan. (a) "Examination of Kola," C. O. Topping; (b) "Reduced Iron," G. C. Steventon; (c) "White Castile Soaps," Samuel R. Knox; (d) "Glycerin of the Market," J. L. Tegarden; (e) "Experimental Work on the Solvent Power of Alcoholic Menstrua," L. D. Havenhill; (f) "A Microscopical Study of *Oicota maculata*," F. Lyle Robertson.

13. "Comparison of Methods of Testing Pepsin." E. H. Bartley.

14. "Laboratory Notes." E. L. Patch.

15. "Grain Weight. A Study of Wheat." J. U. Lloyd.

16. "Analytical Alkaloidal Chemistry." Lyman F. Kebler.

17. "The Names of Medicinal Plants of Commercial Value." William Simpson.

18. "Official Process for Spirit Nitrous Ether." Chas. M. Ford.

19. "Elegant Preparations of Cod Liver Oil." Henry A. Stearns.

20. "Further Notes on Taraxacum Root." L. E. Sayre.

21. "Improved Working Formula, No. 27 National Formulary." Samuel C. Davis.

22. "Allegation in Pharmaceutical Calculations." T. D. Reed.

23. "Additional Experiments with *Datura Stramonium*." Alfred R. L. Dohme.

24. "Hydrocymenes and Derivatives." Edward Kremers.

25. "Oil of Cloves." C. P. T. Fennell.

26. "Microscopical and Chemical Examination of Cloves." Henry Kraemer.

27. "Quantitative Determination of Some Substances in Aqueous Solution by the Refractometer." W. F. Edwards.

28. "Testing for Arsenic of the U. S. P." J. B. Nagelvoort.

29. "What is the Quality of Reduced Iron Dispensed by Pharmacists?" Alfred R. L. Dohme.

30. "The Relation of Hydrastine and Berberine to one another and their mode of Combination in the Drug." Alfred R. L. Dohme.

31. "Relative Value of Two Kinds of Ipecac Root." Alfred R. L. Dohme.

32. "The Use of Isobutyl Alcohol for the Detection of Morphine and Codeine." J. B. Nagelvoort.

33. "A Method for the Estimation of Mono and Bicarbonate of Sodium." W. T. Wensell.

34. *Dionea Muscipula*, Ellis (Venus Fly-Trap). Jas. D. Nutt.

American Chemical Society.

THE IMPORTANCE OF THE STUDY OF BIOCHEMISTRY.*

BY E. A. DE SCHWENITZ,
Washington, U.S.A.

When the controversy between the two schools of the vitalists and chemists as to the true cause of the diseases produced in animals by the inoculation of putrefactive organic matter was at its height, Panum, of Denmark, made some careful researches, and extracted from putrid organic matter chemical substances which, when perfectly free from every form of germ life, produced intoxication and death. But, he said the poison extracted from this putrid matter is undoubtedly a pure chemical compound, it may, however, be produced by a microbe, and both microbe and poison play their part in the disease.

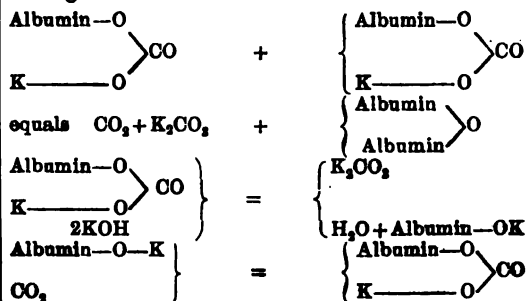
Now more than fifty years later, though the microbial origin of most diseases has been thoroughly established, it has also been shown that the chemical products of these germs are the direct cause, in most instances, of the fatal effects. For example, in diphtheria the growth of the germ is but a local manifestation, while the poison it produces is distributed through the whole system. When, however, the germ has been discovered that is responsible for a disease or for other changes, to which we will presently refer, the door has been opened for a study of the most interesting chemical problems that can be imagined. Germs in general are cells of protoplasm, and it is by a study of their actions and the changes which they produce that we can gain a better insight into the processes of life. Fortunately, the majority of germs can be easily cultivated artificially, so that it is not difficult to obtain solutions of their products, but it is difficult to isolate these products from the solution and determine their nature. For the most part, the substances produced by bacterial growth have been found to belong to two classes, the albuminoids and ptomaines, the latter corresponding closely in many of their properties and composition to the vegetable alkaloids. Our knowledge of the albuminoids, however, is very meagre. We can divide them into certain general classes, as 1, globulins; 2, albumoses (hemi-proteo or deutero albumoses); 3, alkali or acid albumin; 4, peptones, etc.; but with this we have only made a step in the dark, as it has given no idea of the actual composition of the substances about which we speak, beyond that they contain carbon, hydrogen, oxygen, nitrogen, sulphur, and phosphorus, in certain proportions, and differ in coagulation. Do these apparent albuminoid substances from bacteria belong to the class of albumoses, or are they chemical diastases, or ferments, many of the reactions of which they show? Can they be proved to be diastases by their hydrating and digesting action, and shown to be allied to ptyalin, pepsin, etc.? At first it was held, and is still held by some, that the presence of albuminoid matter was necessary to the growth of the germ, and that the products of the germ life were changes or simply decomposition products of the albuminoid matter upon which they fed. But it has been proven too that some of the same substances are obtained by the simple action of acids and alkalies upon albuminoids, and it is often difficult to decide whether the albumoses and alkaloids have been produced by the germs, or by the alkali or acid. To decide this it is necessary to cultivate the germs upon solutions which do not contain a trace of albuminoid matter. This Fermi and Uchinsky have succeeded in doing with a number of different germs upon a solution of glycerin and mineral salts (ammonium phosphate, and acid potassium phosphate), and I have also with

the hog cholera, glanders, and recently tubercle bacillus by the addition of asparagine to the above liquid. From these cultures albuminoid substances have been obtained as well as alkaloids, showing that they have truly been built up and elaborated by the germ, and are to be compared to intercellular secretions and excretions of these minute forms of life, and not to simple products of decomposition from albuminoid matter in solution. That the products formed under the different conditions are similar is shown by the same physiological action of mallein prepared from these artificial cultures or from cultures upon beef broth. This power of the germ to multiply upon a solution of mineral salts where the carbon, hydrogen, nitrogen, and phosphorus are present in an easily assimilable form is not surprising, for we deal here with the lowest form of vegetable life, and it is well known that plants cannot live upon albuminoid matter directly, but only when by decomposition it has been reduced to its elementary condition.

The study of these products of the germ life has made but little progress so far as their actual chemical constitution is concerned. Much more attention has been paid to their physiological effect. It has been learned that some of these products will render an animal insusceptible to the action of disease germs, but what the chemical change which can have taken place and caused this immunity may be, is one of the problems for the biochemist and physiologist to decide.

It has been found, too, that the blood serum of animals that have been made immune to disease has a germicidal action and will render other animals immune. Where does this property lie? What chemical change again has the blood undergone?

In his studies upon the albuminoids of the egg, Scholl has indicated where this property may be. He found that egg albumin exerted a germicidal effect, that this germicidal power was destroyed by heat and could be restored by treating the albumin with alkali. This was similar to some of Buchner's observations upon blood serum, where he found the bacteriocidal property could be restored by the use of an alkali. Scholl's theory for explaining this, and also at the same time the coagulation of albumin, is that the normal albumin has a composition corresponding to a bicarbonate, that upon heating, carbon dioxide is given off and the albumin coagulated by the consolidation of two molecules, while when the alkali albumin is heated no decomposition will take place or coagulation of the albumin.



The carbon dioxide in the albumin is also set free by acid in the cold, which will explain the coagulation of albumin by acid. In the albumin molecule, then, there is a group of atoms with a bactericidal action, which grouping is destroyed by heat and restored by alkali, just as there are certain groupings necessary for the production of a disinfectant, or rather just as the disinfectants are characterised by certain groups. The confirmation of these experiments will open up a field of enormous possibilities, as sulphur is an element

* Read at the Baltimore meeting, December 28, 1893.

which in many cases can replace oxygen, and the resulting compounds would be very interesting, as well as lead to a number of new products, and, eventually, to a better understanding of the albuminoid molecule.

As just mentioned, it has been found that in the case of a great many diseases, animals can be made insusceptible by vaccination, and that the blood of such immune animals will make others immune. But this immunity only holds for the particular disease against which the animal was first vaccinated, and does not protect the animal against another disease. A guinea pig can be protected from a hog cholera inoculation by an injection of the albuminoid product extracted from the cultures. The same pig will die if inoculated with swine plague. If, however, it be vaccinated both for hog cholera and swine plague, with the products extracted from their respective cultures, the animal will be insusceptible to both diseases. Just in the same way in each particular disease some chemical change is produced in the blood or tissues, and the work of the chemist should be to find out what these changes are. The possibilities are enormous, the difficulties many, but by careful study, accompanied necessarily with a certain amount of bacteriological work and the observation of pathological changes, we can hope to arrive at a more definite understanding of the process of life.

It is, however, not only with reference to diseases that a study of biochemistry is important. From a practical and commercial standpoint the work is useful. J. A. Davalos, of Havana,* describes the isolation of a distinct ferment and a number of bacilli from different tobacco leaves, some of which in artificial culture give distinct poisons. The different varieties of tobacco show different germs. These germs, by their growth upon the tobacco, give to it its peculiar flavour and odour, and the different qualities of tobacco owe their value to some particular ferment. As I have noticed, a bright yellow American high grade tobacco shows the presence of a germ altogether different, producing different substances from that of a low grade tobacco. Therefore, if the germs of a low grade tobacco can be destroyed and those from a fine tobacco substituted, we should be able to greatly improve the manufactured article. Now in practice, before the fermentation, some good tobacco is often mixed with the poorer grades to improve the quality. The manufacturer has learned by experience to make use of the different germs of the tobacco. But the chemist should not stop here. He should find out what the products of the growth of these germs are. This is possible, because the germs can be isolated, cultivated, and the product of each individual germ determined, and eventually its identification or synthetic preparation.

Again, in Denmark, the practical manufacture of butter and cheese has been greatly advanced by the use of butter ferments, as they have been called. The flavour and aroma of butter and cheese are due to the products of a particular bacterium, or of several forms. Now these can and have been isolated, and to produce the best butter and cheese only those bacteria are used upon sterilised milk which give a desirable flavour, while normally those with undesirable products would also be present and interfere with the character of the butter and cheese. Here again the products of the growth of these bacteria should be studied, which in many instances would no doubt be found to be substances of easy synthetic preparation. It would be very much better to be able to add to a butter or cheese some particular extract which will impart the special flavour, rather than to have to inoculate the cheese and milk with a particular bacterium or mix-

ture of bacteria for a desired quality. As has been well stated, we may see the time when each dairy is provided with a bacteria farm, and each particular brand of butter and cheese will have its corresponding originator, labelled and reared with as much care as is given to the cow from which the milk is obtained.

In their relation to the soil and plant life, the germs and their products are invaluable. Warrington and Winogradsky, in their isolation of the nitrifying organisms which convert nitrogenous matter into nitrites and nitrates, have thrown great light on the absorption of nitrogen by plants. Recently, Winogradsky has described an organism which converts the nitrogen of the air directly into nitrates. Again, there are a number of germs that are ordinarily found in water or the soil, which will reduce nitrates to nitrites or ammonia, as well as some pathogenic germs usually present in the soil, which will flourish in artificial media in an atmosphere of nitrogen. We know that a subsoil, freshly turned, will not be productive until it has been exposed for some length of time to the air and moisture, and to the action of the germs of the air. The plant does not take up directly in the form in which it exists in the soils, the mineral matter that it needs for its growth, but only when that is modified to a simpler form can it be utilised. Phosphorus is one of the elements which, whether combined in albuminoids or mineral salts, seems to be necessary for the growth of the germ, and is also necessary for the life of plants. By closely following the gradual changes in the artificial cultures of germs, we can arrive at a more definite understanding of the assimilation of mineral matter by the plant, as well as the fixation of carbon, the formation of starch and sugar, and possibly also, as has been suggested, of the building up of alkaloids.

I have only mentioned a few of the many directions in which a conjoint study of bacteria and their products are important, with the desire of emphasising the interest attaching to such investigations. It is along this line of research that the solution of many of the problems of life that have been a puzzle to both physiologist and chemist undoubtedly lies.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

SALE OF POISON BY AN UNREGISTERED PERSON.

At the Sheriff Court, Glasgow, on September 22, before Sheriff Spens, John Taylor, 172, Slatefield Street, Glasgow, was charged at the instance of Richard Bremridge, Registrar to the Pharmaceutical Society, with having contravened the 1st and 15th sections of the Pharmacy Act, 1868, in so far as on May 27, 1894, he—not being a duly registered pharmaceutical chemist or chemist and druggist within the meaning of the said recited Act—within premises at 248, London Road, Glasgow, then occupied by William Nicol, unlawfully and contrary to the 1st and 15th sections of the said Act did sell to Andrew Cottingham, son of, and residing with the now deceased, Andrew Cottingham, 60, Barrowfield Street, Glasgow, a quantity of laudanum—a preparation of opium, and a poison within the meaning of the said recited Act—whereby the said John Taylor became liable in the penalty of £5.

* 'Cronico Medico-quirurgica de la Habana,' 1892. No. 15.

Mr. T. B. Morison, advocate, Edinburgh, appeared for the prosecution.

Mr. Matthew Walker, writer, Hamilton, appeared for the respondent.

The charge having been read over to the accused, he pleaded guilty thereto.

Mr. Walker, addressing the court, said: The accused is an assistant in the shop, 248, London Road, and the William Nicol mentioned in the complaint is a duly qualified chemist and druggist. The accused was in charge of the shop on Sunday evening, May 27 last, and he was in the act of closing the shop when a boy presented himself and requested to be supplied with 4d. worth of laudanum. The accused sent the boy home to ask what was the purpose of the medicine, and he returned shortly afterwards and made the statement that it was to be applied to his father's head, outwardly as the accused understood it. The medicine was then supplied, the accused first of all putting two labels on the bottle, one marked "poison" in red letters. It is hardly necessary to say that the same circumstances would have occurred had William Nicol been present. He happened to be absent on that evening, but the same thing would have taken place, with this difference, that the accused took the precaution to send the boy home to ask the purpose of the medicine. The accused has been nine years at the trade, and has passed one of the examinations necessary to qualify him, and in the circumstances I ask your Lordship to impose a nominal penalty.

Mr. Morison said: I appear for the Registrar to the Pharmaceutical Society, and I think this is a very serious case, and one typical of the dangers to which the public are exposed if poisons are sold by unqualified men. The facts of the case have not been fully brought before your Lordship, and in one respect my information differs very materially from that which was presented by my learned friend, because the facts as I understand are, that this boy Cottingham, who is only eight years of age, went to the shop and asked for 4d. worth of laudanum. That I may explain is a large quantity, and contains several fatal doses. It is true the accused at first declined to sell the poison, and asked what purpose it was for. The boy Cottingham returned to his father, and his account is that he came back to the shop and said it was for killing vermin, and on that statement he says he received the poison. No registered chemist would supply poison in that quantity to a boy eight years of age, and certainly no one who was acquainted with the properties of laudanum would supply it upon the statement that it was for killing vermin. I think also that this is a very serious case in this respect, that from the history of the facts which were brought out by the Procurator Fiscal, who sent the papers to the Registrar with the view of prosecution—

Sheriff Spens: The father drank it, did he?

Mr. Morison: Yes. The next serious stage in the case is that this boy's father is found lying dead with the bottle of laudanum at his bedside. Whether he took the poison with a suicidal intention or by misadventure is probably unknown, but at all events it is certain that this boy's father died from the effects of the laudanum which was purchased in this very slipshod way. Now the Act was passed to prevent cases of this kind, and it requires that no person shall sell the poison, even although he may be assisting a registered chemist, unless the person actually conducting the sale has the necessary qualification, that is to say, has passed the examinations, and is acquainted with the properties of poisons. Of course anything may happen if poisons are to be sold in this way.

Sheriff Spens: Is there any clause in the Act with reference to the sale of poisons to children?

Mr. Morison: No, there is no special provision in regard to that.

Sheriff Spens: You mean it may be sold to a child of three, four, five, six, seven, or eight years of age?

Mr. Morison: I think it is the practice of registered chemists never to sell poisons to children at all. What they do is, they send the child home and say they must have an older person with them. I understand that is the registered chemist's practice.

Sheriff Spens: There is no provision for it?

Mr. Morison: There is no provision for it, but all the penalty that can be imposed under the fifteenth section is a penalty of £5, and I would move in the circumstances that the full penalty be imposed. It was not a case of breach of the Statute in ignorance; the man knew perfectly well he was contravening an Act of Parliament which was passed for the safety of the public, and in moving for the full penalty, I also ask for costs. The provision is that the penalty to be recovered is a sum of £5, meaning, I understand, that the full penalty is to be imposed in every case; although sometimes the penalty is modified, but I think this is not a case where modification should be made.

Sheriff Spens: Does it say "not exceeding £5"?

Mr. Morison: No, it is £5; and in England it is the practice for the full penalty of £5 always to be imposed; but, of course, this is a prosecution under the Summary Procedure Act, and your Lordship has power under that Act to modify the penalty.

Sheriff Spens: I am not so sure of that. The Summary Procedure Act is merely the procedure in applying this Act. I think the penalty must be £5.

Mr. Morison: Well, my Lord, I cannot argue it is so, that is our view, but we have never pressed it so in the court.

Sheriff Spens: What are the words of the Summary Procedure Act?

Mr. Morison: We have always felt the difficulty of the point, and we have never raised it. While we cannot say your Lordship has not power to modify the penalty, I move for the full penalty in this case on account of the flagrant breach which was committed by the accused.

Sheriff Spens: I doubt if there is any power, but I do not see why I should not impose the full penalty.

Mr. Walker: I do not know how far it is fair to connect accused with this suicide?

Sheriff Spens: That has nothing to do with it. The Pharmacy Act provides that no unqualified man shall sell poisons and I do not think any such sale should have taken place to this child.

Mr. Walker: Of course the accused's story of the message brought back to him differs from that of the prosecution.

Sheriff Spens: My own view is that the Summary Procedure Act does not affect the penalty. The words of the Pharmacy Act are that he is liable in a £5 penalty, the Summary Procedure Act only affects the procedure.

Mr. Walker: I was assuming, of course, that your Lordship has power to modify the penalty.

Sheriff Spens: Even if I had, I do not think I would be inclined to do it here.

Mr. Morison: I move also for the costs.

Sheriff Spens: What do they come to?

Mr. Morison: £2 1s. 8d. I understand.

Sheriff Spens: Well, I will say £2. Are the expenses to be paid just now?

Mr. Walker: Yes.

Sheriff Spens: I will say "in respect that the penalty and expenses are paid at the bar, I find it unnecessary to make any further order with regard to the recovery thereof."

The fine and costs were then paid.

PROSECUTIONS BY THE INLAND REVENUE AUTHORITIES.

ALCOHOL IN TEMPERANCE DRINKS.

A case of considerable importance to manufacturers and sellers of "non-intoxicating" liquors came on for hearing at the Lancaster County Petty Sessions on Saturday, when James Warwood, shopkeeper, Morecambe, was summoned at the instance of the Excise authorities for selling alcoholic liquors without a licence. Mr. Alpe, of Somerset House, prosecuted, and said the action was brought under the Act of William IV., the penalties sought to be recovered being £10. It was the first case of the kind brought by the Commissioners of Inland Revenue, and they had been induced to take proceedings because the manufacture and sale of these so-called temperance beverages—such as hop ale and herb beer—were largely on the increase in the neighbourhood. The object was to make manufacturers more careful to keep within the limit allowed by law, viz., two per cent. of alcohol. Defendant was a shopkeeper, and also had a stall on the sands at Morecambe, where he sold hop ale, herb beer, and similar commodities. On August 3, Mr. Eaton, supervisor, purchased from him a bottle of hop ale and two bottles of herb beer for the purposes of analysis. They were analysed at Somerset House, and in one case the proportion of alcohol or proof spirit was found to be 3·4 per cent., in another case 4·34 per cent., and in a third case 2·3 per cent. Samples of this kind of drinks had been taken which showed that in some cases they contained from 8 to 10 per cent. of proof spirit, whilst the strength of good ordinary beer was from 7 to 8 per cent., so that not only was there an evasion of the law, but these beverages were foisted upon the public as temperance drinks when they really contained more alcohol than ordinary beer. In the course of the case it was remarked that had the liquor been drunk instead of sent for analysis, the penalty would have been £25 instead of £10. Mr. Eaton said he had warned defendant and all the sellers of these drinks that they contained alcohol, but no notice was taken of the warning, and therefore these proceedings were instituted. Mr. Tilly, for the defence, said Mr. Warwood was innocent of any intention to evade the law. He bought the beverages direct from the manufacturer, and sold them as he bought them. It was, however, impossible to manufacture these beverages without alcohol, because the process of fermentation, which was one of the elements of their manufacture, produced alcohol. Mr. Alpe pointed out that it was possible to make these drinks without alcohol, and stated that one well-known temperance "ale" contained only 1 per cent. of alcohol. The Chairman (Mr. E. B. Dawson) said defendant had not intentionally done wrong, but these drinks were foisted upon the public as non-intoxicants, and no doubt hundreds of people were deluded. A fine of 10s. and costs was imposed.—*Yorkshire Post*.

THE SALE OF MEDICINES UNSTAMPED.

James Ockenden,* chemist, 18, Moorfields, appeared at the Mansion House, before Mr. Alderman Samuel, on September 24, upon four summonses for selling tinctures of belladonna, aconite, and nux vomica, and eucalyptus globules and pastilles, without the Inland Revenue stamps required by the Medicines Stamps Act, 52 Geo. III., cap. 150, sec. 2. Mr. Dennis appeared for the Inland Revenue, and Mr. Lewis Thomas represented the defendant. In opening the case, Mr. Dennis said stamps were required on all medicines in which the vendors claimed the occult secret or art necessary in the preparation of the same, or which

* This name does not appear on the Register of Chemists and Druggists for 1894.

were manufactured under Letters Patent. The third category of medicines in regard to which stamps were required was the one relied on in this case—namely, medicines which were held out by notice or advertisement, or which were recommended to the public as beneficial for the relief or cure of disease. Evidence was given of the purchase of the tinctures, which were contained in a half-crown case of homoeopathic medicines, purchased from the defendant. Mr. Lewis Thomas said the tinctures had been sold to the public for the last ten years without any interference from the Inland Revenue authorities, who were consulted before they were offered for sale at all, and who, on the authority of Sir John Bridge, decided at that time that no stamp was necessary. He submitted that these tinctures were not held out in the handbills enclosed in the box as nostrums or as specifics for the prevention or cure of disease. The Alderman: But there are the recommendations in the handbill headed "The Preservation of Health and Restoration to Health." Mr. Lewis Thomas: If you were to tell a man to put his head under a pump, as it was good for the headache—The Alderman: The Inland Revenue would say that the pump must have a stamp on it. Mr. Lewis Thomas: But the pump could not be held to be a tincture or nostrum. He further submitted that the sale of the tinctures came within the two exemptions allowed by the Act, namely, where the drugs were uttered or vended entire and without admixture, or where they were sold by a person licensed to sell medicines chargeable with the stamp duty. The Alderman: In the Act the words "and having the labels properly stamped" follow the words you have read. Mr. Dennis: The burden of proving that the drugs were entire is on the defendant, and as a fact the word tincture implied that the drug was a spirituous compound. Evidence was then given as to the purchase of the eucalyptus pastilles. Mr. Thomas thought this was a very vexatious summons, as the Tasmanian Eucalyptus Oil Company, who manufactured the pastilles, had been in communication with the Inland Revenue Department, and on finding that a stamp was required, had called in the issue of boxes for the purpose of having them stamped. The Alderman said the defendant in that instance might be a victim; but it was a very flagrant case, and he should impose the full penalty of £10. For selling the tinctures the defendant would have to pay in each case a fine of 20s. and costs. It was stated that the total amount of fines and costs was £13 16s. Mr. Lewis Thomas intimated that there might be an appeal.—*Daily Graphic*.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

DEFICIENT TINCTURE OF RHUBARB.

At the Saddleworth Police Court on Wednesday, September 12, before Mr. B. Bent and other magistrates, Albert Ashworth, general dealer, Greenfield, was summoned for a breach of the Food and Drugs Act. Mr. A. L. Bridge, who until recently has acted as the County Council analyst, prosecuted, and Mr. Innes, of Stalybridge, conducted the defence. Mr. Bridge said on June 22 he went to defendant's shop and purchased two ounces of tincture of rhubarb, for which he paid sixpence. He then told defendant it was for analysis, and the tincture was divided into three parts in the usual way. One part was sent to Mr. Allen, the county analyst, who had since sent the following certificate: I am of opinion that the sample contained the parts as under: extractive matter 2·60, absolute alcohol 24·19, water 73·21. The sample contained only one half the amount of extractive matter

natural to genuine tincture of rhubarb of good quality, and but little more than one half the amount of alcohol which is prescribed by the British Pharmacopœia to be used in its preparation; in addition to this the sample was destitute of saffron, which is directed by the British Pharmacopœia to be used in the preparation of tincture of rhubarb in the proportion of a quarter of an ounce to a pint. Mr. Innes questioned Mr. Bridge as to whether the spirit and the saffron might not have disappeared through the bottle being repeatedly uncorked and exposed to the light, and Mr. Bridge contended that no material difference would thus have been made to the tincture. Mr. Innes said he had authority for saying that Mr. Bridge was wrong. Mr. Innes had three lines of defence. In the first place, he contended that the summons was bad, inasmuch as it had not been taken out within twenty-eight days; in the second the defendant was exonerated, because on the bottle purchased from the wholesale dealer there were the words: "warranted genuine;" and in the third he maintained that the spirit and the saffron had evaporated, and the defendant was not liable. The bottle of tincture of rhubarb was purchased ten years and a half ago, and they could not be surprised if a change in its composition had taken place. As regarded the saffron, it was of small account if it had disappeared, as it was only used for colouring purposes. Mr. Bridge said the saffron had medicinal qualities. When the magistrates, on the advice of their clerk, decided against him on the two first points, Mr. Innes called defendant and his wife to prove that the tincture was purchased over ten years ago, and had never had water added to it. A fine of 5s., including costs, was imposed. The magistrates considered that the defendant had broken the law unknowingly.—*Oldham Chronicle*.

POISONING CASES AND INQUESTS.

POISONED BY CARBOLIC ACID.

Mr. Coroner Iveson and a jury held an inquest at Gainsbro', on September 18, as to the death of a Gainsbro' hotel-keeper named John Brook, aged 45. Deceased had swallowed a quantity of carbolic acid out of a bottle kept in the house. His wife heard him fall and called a neighbour, who gave what assistance he could, but death speedily took place. Police-constable Holliday said the previous night just after 11 o'clock he went to the house of the deceased and found him lying on his back on the floor quite dead. He found a blue-coloured bottle empty, but smelling strongly of carbolic acid, and labelled so. There were two tumbler glasses on the table, one containing water and the other a small portion of carbolic acid, of which the room smelt strongly. Dr. Wright stated that he was called in to see the deceased, and found him dead, and carbolic acid had caused corrosions on each side of the chin and throat, death having resulted from poisoning by that agent. Deceased had been "very unlucky" in business, and had drunk heavily. He filed his petition some seven months ago. It was shown that the brandy bottle was kept in the same cupboard as the carbolic acid, and a verdict of "Death by misadventure" was returned.—*Sheffield Independent*.

CHILD POISONED BY SOOTHING SYRUP.

The Bolton Borough Coroner, Mr. R. Taylor, held an inquest at the Victory Hotel, on September 21, respecting the death of Thomas Slater Booth, thirteen months old, son of Adam Booth, 22, Victoria Grove, which occurred on Wednesday. Elizabeth Booth said deceased had recently been troubled with his teeth

and restlessness. On Tuesday night she administered a teaspoonful of Hamer's infant preservative in accordance with the directions. She had previously used it for the same child occasionally without evil results. The following morning deceased seemed very unwell, and Dr. Garstang was summoned and attended up to death taking place. Dr. Garstang deposed to visiting deceased and finding him in a comatose condition. The pupils of the eye were intensely contracted, the surface of the body pale, there was some cold perspiration, and the child was breathing slowly. It was with great difficulty that it could be awakened, and it immediately relapsed into the original condition. These symptoms coincided with opium poisoning. On questioning the mother she explained that she had given the child some soothing syrup. In witness's opinion death was due to opium poisoning acting on an enfeebled constitution. On a healthier child a similar dose would probably not have had a similar effect. The Coroner: That shows the folly of labels advising a certain quantity to be administered to every child between specified ages. Dr. Garstang considered that opiates ought not to be given in any case except under medical advice. The Coroner endorsed this view of the matter. It was undoubtedly a common practice, and there was nothing to prevent the sale of it at present. It was the first inquest he had held under such circumstances. Poor people could not afford to rush to a doctor every time, but they thought if they acted as in that case, a very small quantity should be given, and that diluted. Ultimately the following verdict was returned, in accordance with medical testimony: "That deceased died through opium poisoning, acting on a previously enfeebled constitution, and administered inadvertently by the mother."—*Bolton Journal*.

ACCIDENTALLY POISONED BY CARBOLIC ACID.

The Coroner of the Mid Division of Oxfordshire, Mr. W. Robinson, held an inquest on September 24 on the body of Arthur Machen, aged 43, a retired farmer, who died from the effects of drinking carbolic acid. The inquiry took place at the residence of the deceased at Shot-over Hill, a short distance from Oxford. The widow stated that on the previous Monday she accompanied her husband to Bewdley, where he went in order to take a farm. They returned home on Thursday evening. At her request her husband went into the kitchen for some water. He called out, "I have done something," or "I have done it; run and get some one." She asked him what he had done, and all he replied was, "Carbolic acid; run and get some one." She went for assistance, and he followed her. They went to a neighbour's house, which was within a short distance. He was laid on a sofa, and emetics were administered. A doctor was sent for, but her husband expired a few minutes before he arrived. The bottle of carbolic acid was kept on the chimney-piece in the kitchen, and was used for sanitary purposes. A medicine bottle was also kept on the mantelpiece. The jury returned a verdict of death from misadventure.—*Daily Chronicle*.

DEATH FROM OVERDOSE OF LAUDANUM.

On Saturday, September 22, a woman named Jane Calder, residing at 15, Saunders Street, Edinburgh, was admitted to the Royal Infirmary suffering from the effects of poisoning by laudanum. She did not long survive her admission to the institution, dying early on the Sunday morning. It seems that the unfortunate woman, feeling ill, had taken some laudanum to relieve a pain in the side—the dose being, as the result proved, excessive.—*Sootsman*.

Patent Office Business.

PATENTS FOR MEDICINAL PREPARATIONS.

Complete Specifications Accepted.

No. 12,796.—August 4, 1894.—Frederick William Fletcher, Beauchamp Lodge, Enfield. Improvements in cinchona preparations, consisting in the use of hydrobromic acid as a solvent for the extraction of the alkaloids and other active principles of cinchona bark, and the production thereby of improved preparations containing in perfect solution the whole of the constituents of the bark in intimate association with bromine, and capable of being taken without ill effects by persons in whom cinchona bark and its preparations have hitherto produced unpleasant symptoms.

No. 21,927.—August 11, 1894.—Dr. Edwin Klebs, of 8, Jahn Strasse, Karlsruhe, Berlin. Production of a medical preparation (antiphthisin) for use in tuberculosis, from the tubercle bacillus, and the process employed therefor, consisting in the addition of cresol to the tubercle culture fluid, filtering, adding sodium bismuth iodide in excess, then soda lye, again filtering, and finally precipitating "antiphthisin" from the fluid by the addition of alcohol.

No. 13,496.—August 18, 1894.—Emma Hopkins and Elizabeth Frost, both of Windsor Road, Slough, Buckinghamshire. An ointment for gatherings, abscesses (?), warts (?), etc., consisting mainly or wholly of an extract of "lady" thistles, lard, and beeswax.

Reviews and Notices of Books.

THE PHYSIOLOGY OF THE CARBOHYDRATES. By F. W. PAVY, F.R.C.P. Pp. i. to x., 1 to 280. London. 10s. 6d. J. and A. Churchill. 1894.

Dr. Pavy's views on diabetes are so well known that when, in his recent lectures at the Royal College of Physicians, he promised us a new departure, the general interest was keen indeed. What the new departure is he tells us in a work of about 300 pages, full of detail and matter. We cannot attempt to give a complete review or abstract of the book. Dr. Pavy assails the validity of the doctrine of the glycogenic function of the liver, according to which carbohydrates are stored up in the liver as glycogen, ready to be converted into sugar in a position to be utilised within the system. He shows (1) that the liver during life is not in a more saccharine condition than other organs. Sugar exists as a normal constituent of all the tissues and organs of the body. After death glucose is found in the liver, during life, however, a different sugar with a cupric oxide reducing power below that of glucose—in fact, the same sugar as is found in other structures. (2) The blood flowing from the liver does not contain more sugar than that flowing to it. Sugar is found equally distributed throughout the circulation, arterial, portal, or venous. After fasting, the portal blood contains as much sugar as other parts of the circulation. After the ingestion of carbohydrates it contains much more. This shows that sugar does not disappear in the capillary areas, and that there is no evidence that sugar is supplied constantly from the

liver to the systemic capillaries, so that the liver exerts a check on the progress of the carbohydrate into the systemic circulation. This it does by converting the sugar carried to it by the portal vein into glycogen. In this Dr. Pavy agrees with others, but not further. The general belief hitherto adhered to is that the stored up glycogen is subsequently converted into sugar, and gradually and slowly given out in this form. This view is severely criticised, and the following objections are raised:—(1) In a rabbit the stomach is never empty, and in the portal blood, therefore, is always more sugar than in the systemic blood, which excess must be constantly checked by the liver. As Dr. Pavy says, "A state constantly calling for the exercise of a stoppage action is not reconcilable with stoppage for temporary storage." (2) Healthy urine contains sugar, which varies in amount with that of the blood of the general circulation. Both the blood of the general circulation and the urine remain uninfluenced by the injection of carbohydrates into the body so long as it does not exceed ordinary limits, so that in an animal like the rabbit, a vegetable feeder, we ought to have a constant storage by the liver (according to the older view). But can such a process of storage be carried on indefinitely? In fact, one is compelled to admit that ingested carbohydrates have no effect on the urine, because the amount of sugar in blood and urine remains unchanged, whether the animal be feeding or fasting.

The liver, therefore, does not store up carbohydrates as glycogen for subsequent discharge as sugar into the general circulation—it keeps the blood free from sugar and prevents the sugar of digestion—brought to it by the portal blood—from passing on. In diabetes we would have then a failure of the checking action of the liver, and the symptoms of the disease are due to sugar being allowed to reach the general circulation, so that these would depend (a) upon the extent to which this checking action of the liver is impaired, and (b) upon the amount of carbohydrates ingested. In severe cases of diabetes where sugar is excreted apart from food, we have a splitting up of the "glucoside proteids." Dr. Pavy, as the outcome of many experiments and analyses, argues that proteids are "glucosides," and this is the "newest" departure and a conception which must have created much surprise when first put in words. Analytically, he showed that out of proteids a cupric oxide reducing substance is readily separated, the source of which, it is argued, lies in the disruption or cleavage of the proteid molecule itself on the following grounds: (a) the amount of cupric reducing substance obtained varies with the strength and the length of time of contact with the caustic potash used for solution of the albuminous material tested. Had there been free glycogen or starch, the amount would not have varied in this manner. (b) On treating egg albumin with water at a temperature of 150° C., unmistakable evidence of cupric oxide reducing products was obtained. (c) On appropriately treating egg albumin with caustic potash and alcohol precipitation, a substance is

obtained resembling Landwehr's "animal gum," which on treatment with sulphuric acid responds to the copper test, and with phenylhydrazin needle crystals of glucosazone is diffusible, therein differing from the amylose carbohydrates. This substance, which is not glucose, gives all the characteristic sugar reactions, and sugar Dr. Pavy does call it. It is not fermentable, and causes hardly any rotation with the polarimeter ($0^{\circ}1$ levorotation), *per se* not objections of great weight. (d) The sugar can be separated with sulphuric acid alone without previously boiling the albumin with caustic potash. Various forms of osazone crystals are then obtained with phenylhydrazin, depending on the amount and duration of heat used during the process. (e) From the osazone the sugar could be recovered by Fischer's process. (e) Proteolytic ferments (pepsin) will set free the carbohydrate constituent of the proteid molecule in the form of sugar, as shown by the osazone test. Theoretical considerations have further convinced Dr. Pavy of the correctness of his view. He alludes to the yeast plant, which uses up carbohydrates to build up its proteids, and "it is recognised by vegetable physiologists that asparagine, by combination with carbohydrate matter and the sulphur of a sulphur-containing body, is extensively concerned in the formation of proteid," and it further seems probable "that proteid plays a participating part in the process of deposition of carbohydrate as a fabric and as a store material."

We must therefore regard proteid matter as a distinct source of carbohydrate, and a part of the carbohydrate is used up in the formation of proteid and fat. Carbohydrate, reaching the liver as sugar, under the influence of living protoplasm, is (1) changed by dehydration into glycogen. When glucose is injected into an animal it does not reappear as such, but in a form possessed of a lower cupric oxide reducing power, while in diabetes the urine ordinarily contains glucose. (2) The carbohydrate is utilised in the production of proteid matter (3) and also transformed into fat mainly in the intestinal tract, the villi being the seat of fat production from carbohydrate, while the liver plays but a supplementary part in the process, producing fat from the carbohydrate which escapes the villi and reaches the portal vein as sugar. Dr. Pavy surmises that the process of transformation is not a direct one, but one in which the production of proteid plays an important part. "The protoplasmic matter of the cells of the villi may first lead to the incorporation of the carbohydrate into proteid, from which, by cleavage, the fat may be afterwards thrown off," just as in the formation of adipose tissue, the protoplasm of the connective tissue splits off fat, and as the fat elements of the milk are derived by a process of splitting up from the mammary epithelial cells. Summing up, Dr. Pavy says "protoplasmic action is the agency by which the appropriation of carbohydrate matter is effected, and the agents of appropriation are the cells of the villi and of the liver. Under normal circumstances carbohydrate is not allowed to pass these lines of stoppage. Conditions leading to its doing so occa-

sion saccharine urine, which stands proportionate in extent to the amount of carbohydrate that escapes arrest, and is thus permitted to reach the general circulation." We see then that there is much new matter in this work of patient labour and research. It is full of suggestions, and will no doubt have to run the gauntlet of severe criticism. Any real chemical advance in our knowledge of the constitution of proteids is welcome and desirable, and here we seem to have a great step in this direction. It is to be regretted that the style is often so elaborate and heavy that many passages are almost unintelligible on first reading them—a great drawback where the subject in itself is one requiring the closest attention.

GUY'S HOSPITAL REPORTS. Edited by W. HALE WHITE, M.D., and W. H. A. JACOBSON, M.A., M.Ch. Vol. L. Pp. i.-xl, 1 to 738. 10s. 6d. London: J. and A. Churchill.

The wealth of material for clinical study afforded by the various London hospitals is scattered over so wide an area, that in spite of the activity of medical journals and medical societies, whose published transactions contain numerous papers and recorded observations, much invaluable knowledge is lost to the world for want of adequate organisation. The larger medical schools publish annual reports, which not only constitute invaluable archives, but also reflect in varying degree the spirit of the individual schools. The editing of the present volume has entailed more than usual labour, since it includes a useful condensed general index to the whole series of fifty volumes. This index enables us to recall the great minds whose professional activity was centred in the institution founded by the eccentric philanthropist whose name it perpetuates. The earliest volumes contain many contributions by Thomas Addison and Richard Bright, great physicians whom men now near the seventies remember as friends and consummate practitioners of the healing art, and whom the world acknowledges as giants in medical science. Later such names as William Gull, Hilton, Fagge, and Walter Monon appear to show that Addison and Bright left worthy successors, who have now, like their teachers, passed away. And, if it were needed, the present volume affords ample evidence that the spirit of these great men still lives in the workers who now occupy their place. Dr. Wilks contributes a paper relating the first case of aneurism treated by pressure, and so recalls to memory a great surgeon, Aston Key.

Mr. Jacobson, one of the editors, deals ably with one of the many dangers incurred by medical men in an article on primary syphilitic sores on the hands. Drs. Shaw and Perry contribute an exhaustive treatise on diseases of the duodenum, and among other articles is one by Dr. Bryant on hyperpyrexia, in which the guiding hand of Dr. Hale White, the other editor, can be traced, and Dr. White contributes a paper on diabetes mellitus. Mr. Targett has an article on a parasitic affection—hydatids of bone, and Mr. Gowland Hopkins one on some of the anatomical and physiological effects of a somewhat rare and very fatal disease, pernicious anæmia, the cause of which is still

unknown. Dr. Savage has a paper on suicide, Dr. Goodhart one on heart disease, Mr. Tabby on spinal disease, and Dr. Goodhall on hæmorrhagic diphtheria and scarlet fever. Mr. Higgins has a paper on distension of the frontal sinus.

Dr. Stevenson relates a case of especial interest to pharmacists—a case of poisoning by terchloride of gold. A boy had opened and sucked a tube, containing that substance, found by one of his playmates on a dust-heap, where it had found its way probably from some photographer's workshop. He was admitted in a state of collapse on October 22, and discharged quite well on November 4. The chief symptoms were vomiting, thirst, and diarrhoea. There were purple-black stains about the mouth, and gold was found in the vomit and feces, but not in the urine. The immediate treatment consisted in the exhibition of white of egg and milk, and in the application of warmth. The vomiting ceased on the first day, and on the second the patient was fairly recovered.

The volume is full of interest to medical men. It is well worthy of its predecessors, and of the great traditions of Guy's Hospital.

Correspondence.

A SOAP BASIS FOR LINIMENTS.

Sir,—My paper on "A Soap Basis for Liniments" being taken as read at the Conference meeting, I had not the opportunity of verbally commenting on the sample of lin. iodi submitted. The action of the alkaline oleates, etc., of the soap on the iodine has the effect of completely decolorising the preparation, which is a brownish-yellow when first made, rendering it snow-white in a few days. This may be due in part to the formation of hypoiodite of soda, which, I think, would scarcely affect the usefulness of the liniment as an absorbent application, hypoiodites having been found effectual *per se*, but of this others must be left to judge.

225, Oxford Street, W.

E. W. LUCAS.

THE REVISION OF THE BRITISH PHARMACOPEIA.

Sir,—Mr. Peter Boa asks me to prepare a sample of ung. resinae by my method and let it finish off itself—his method—and he hints that then I should be in a better position to judge of and report on the view he takes of the subject. When I say that I should certainly require at least six months to bring such an experiment to a satisfactory issue, and that I have in hand many a little job that leads along the flowery way of hope and faith, whilst his would, to my way of thinking, lead along the thorny by-path of doubt and trepidation, I think he will pardon me for not accepting the challenge. Last year about this time we did prepare certain ointments with the view of testing their keeping qualities. One or two of them still escape Time's ordeal, and seem quite presentable. Amongst these is ung. resinae, a sample of which I take the liberty of sending you, together with a few more of my pets of later production for your kind inspection. Until the last two or three years we could not get ung. resinae of such uniform appearance or stability as to meet the requirements of the public when asking for "yellow basilicon," or the more exacting view of the pharmacist as to what a good ointment ought to be. After trying various formulae from continental pharmacopœias with no better result, we had to fall back upon certain modifications of our own B.P. Feeling strongly that, generally speaking, the less heat employed in ointment making the better, we used the equivalent components of the ung. simplex, and remembering that our grand old teacher—Dr. Redwood—used to caution us against the lighter coloured and more opaque pine resin as being a hydrate and not properly soluble in melted fats, we chose that which

we think should be called "rosin" from its dark, bright amber colour, approaching to a rosy red. To save so much stirring whilst on the water-bath we devised the plan of scattering (not sifting) this in powder over the surface of the liquid mass, and found it answer better than we had expected, each instalment of added rosin dissolving at once before it could reach and agglomerate at the bottom of the vessel, finishing off an article of first-class character in half the time, and with less than half the exposure to heat formerly required. With very great respect I would suggest that my fellow-worker repeat his experiments for himself, and be sure to keep the product for at least six months, then to take outlets from the centre and compare with the circumference, then if the results are in every sense satisfactory I shall—if I have the chance—admit most frankly my judgment too hastily formed, and if I have not the chance, I feel sure he will forgive just the same. Yet I cannot close without saying that I think those ideas arise from a mistaken view of the cause for the shrinkage of fats when left to cool of themselves. That cause will, I think, be found in the different physical structure of the mass, resulting from an effort of the components to assert each its own individuality as much as possible, a tendency which judicious stirring helps to keep in check. Why, you cannot incorporate water (either liquid or vapour) by simple stirring with melted fat; if you wish to incorporate either water or glycerin there is a point in the cooling process when you may do it by dexterous beating, and then you get in air as well, which results in the formation of a more or less unstable cream—but this is beyond the present question.

West Marylebone.

J. C. HYSLOP.

*** The specimens sent include the ointments of red oxide of mercury, carbolic acid, boric acid, and resin. They are all of very satisfactory consistence, and the resin ointment is a particularly fine sample, considering the length of time it has been made. [Ed. Pharm. Journ.]

Answers to Correspondents, etc.

"Secundus."—1. *Cakile maritima*. 2. *Silene maritima*. 3. *Salicornia herbacea*. 4. *Lithospermum officinale*. 6. *Suaeda maritima*.

A. W. Nunn.—You have omitted to describe your method.

"Student."—The metal is, of course, in an extremely fine state of sub-division, but opinions differ as to the extent to which oxidation may take place under normal conditions. The subject has never been properly investigated.

Diary of the Week.

TUESDAY, OCTOBER 2.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

WEDNESDAY, OCTOBER 3.

Pharmaceutical Society of Great Britain, at 11 a.m.

Council Meeting.

School of Pharmacy, at 3 p.m.

Distribution of Prizes by the President, Mr. Michael Carteighe.

Introductory Sessional Address by Mr. Walter Hills.

Pharmacy Club, at 5.45 p.m.

Dinner at the Café Royal.

THURSDAY, OCTOBER 4.

Chemists' Assistants' Association, at 8.30 p.m.

Inaugural Address by the President, Mr. R. H. Jones.

FRIDAY, OCTOBER 5.

Quekett Microscopical Club, at 7 p.m.

Exhibition of Objects.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bannister, Buckley, Ebert, Ellis, Gane, Gibson, Gill, Hallberg, Hill, Hunt, Kebler, Lucas, Muir, Nunn, Oldberg, Reynolds, Shuttleworth, Taylor, Weddell.

THE PHARMACEUTICAL SOCIETY AND ITS WORK.*

BY WALTER HILLS,

Member of the Council of the Pharmaceutical Society.

One of the three objects for which the Pharmaceutical Society was founded in 1841 was the "advancement of chemistry and pharmacy, and the promotion of an uniform system of education for those who should practise the same."

So impressed were its enlightened founders with the importance of this branch of their work that they took immediate steps to provide a school of pharmacy, and in the very next year the first courses of lectures in connection with it were delivered in this house. Such lectures, together with practical laboratory instruction, have been continued to the present time, and we are now met to offer our congratulations and present prizes to the successful students of the fifty-second session, as well as to welcome those of the fifty-third.

This and similar occasions may be regarded as annual field-days of the educational work of the Society, and they afford fitting opportunities for the consideration of all matters relating to pharmaceutical education.

Prior to 1868 it was not the custom to have a formal address at the commencement of a new session, but in that year Mr. H. B. Brady was asked to undertake the duty, and this was the beginning of a series of admirable addresses, about half of which have been delivered by prominent members of our own body, and the remainder by men of science interested in our work, though not belonging to our calling. The Council has conferred upon me a great honour in requesting me to give the address on the present occasion. I assure you, that only after much hesitation have I accepted the important duty, for I feel fully conscious of my inability to speak to you with the eloquence and authority of my distinguished predecessors, all of whom had more claim on your attention than I can expect. Still, loyalty to my colleagues and to the Society bids me undertake the duty, and I must ask you to overlook my shortcomings. It so happens that the date of Mr. Brady's address lies just midway between the present occasion and the evening meeting which inaugurated the first session of the Society's school, and this fact suggested the idea that it might be interesting and instructive if I recalled to your minds a few of the incidents of 1842 and 1868, particularly those in any way bearing on that branch of the Society's work which specially claims our attention this evening, namely, pharmaceutical education.

In January, 1842, some seven months after the organisation of the Society, the first evening meeting for scientific discussion was held on these premises. Unfortunately the distinguished President, William Allen, F.R.S., was prevented through indisposition from attending, and his address was read by the Vice-President, Mr. Payne. Papers were also read by Squire and Redwood, and in the discussions which followed appear the

familiar names of A. T. Thomson, Bell, Ince, Wilkinson, and Morson. This was the first of many such gatherings held during that year; and it appears that not only in London, but at Exeter and Bath, as well as at other provincial centres, similar meetings were held.

On May 11 an introductory lecture to a course on general and medical botany was delivered by Dr. A. Todd Thomson, and a few days later the following lecturers were appointed for the winter session:—

Dr. A. Todd Thomson	{ Medical Botany and
	{ Materia Medica.
Mr. Geo. Fownes	. . . Chemistry.
Mr. Redwood	. . . Pharmacy.

To make the note of these earlier appointments complete I may here mention that Dr. Jonathan Pereira was elected Professor of Materia Medica in 1843, from which date until his death he was inseparably connected with the progress of the Society's educational work, and his memory is perpetuated in the medal which bears his name, and has been presented this afternoon.

On the same day that Fownes and Redwood received their appointments, Thomson commenced his course of lectures on botany, and it is on record that upwards of forty tickets were taken for the course.

In September Mr. Redwood should have given an introductory address preparatory to the winter course of lectures, but he was unable to do so in consequence of a severe cold. And it was on this occasion, to which I have already alluded, that Mr. Payne, the Vice-President, who seems to have been a ready and fluent speaker, gave an admirable address to the students. He was fully conscious of the value attaching to advanced education, and he felt it was of the utmost importance that the pharmaceutical chemist should aspire to a higher intellectual level than that of the ordinary tradesman. Hear what he says, and the words, with one or two minor alterations, might be used to-day: "In these remarkable times, when education is everywhere spreading, when literary and mechanics' institutes are flourishing, when medical and surgical schools are multiplying on every side, shall the chemist and druggist, who is entrusted with so large a share in the preservation of the public health, be behindhand in a strenuous effort to obtain a thorough acquaintance with an art and science which connects him with a noble profession, and demands and is worthy of the full and energetic application of the human mind?"

Finally, the first associate (by examination) was admitted in November, and the second in December of that year. I may also mention, in passing, that the subjects as arranged at that time for the Minor—which was then intended as an assistants' examination only, and gave the associateship of the Society—were the pharmacopoeia of the London College of Physicians, prescriptions, and practical pharmacy. For the Major, the same subjects were taken, but a greater degree of proficiency was required, with the addition of the sciences of chemistry and botany and the rudiments of toxicology.

These few details, taken from the records of 1842, are sufficient to impress us with the foresight and unselfish loyalty to their call.

* Introductory Seasonal Address delivered at the commencement of the Fifty-third Session of the School of Pharmacy, October 8, 1894.

ing of those eminent men who founded this Society. We cannot fail to be struck with their earnestness in taking up so rapidly and thoroughly the work of raising the educational status of those who were to follow them. Their enlightened efforts in this and other directions were speedily recognised, for in the succeeding year, 1843, a Royal Charter of Incorporation was granted to the Society.

For many years after the institution of the School of Pharmacy, practical chemistry was taught in a laboratory in the basement of the Society's premises, but the accommodation being found insufficient, the present commodious laboratory was constructed in 1860. This undertaking was rendered practicable by the receipt of a handsome legacy from Jacob Bell, whose name will always be mentioned here with the profoundest respect and gratitude, for to him, perhaps, more than to any one individual is due the early successful work of the Pharmaceutical Society.

We now pass on to 1868, a year, for many reasons, the most important in our annals, because Parliament then recognised that it was necessary for the safety of the public that those who called themselves chemists and druggists, and who handled poisons, should prove their qualification for the title they claimed, and for the important operations they were called upon daily to perform.

I need not here discuss political matters, but this I may say, that if all who at that time practised pharmacy had been earnest and united in their efforts and demands, a more satisfactory Act than that of 1868 would probably have been passed. However, there is very much that is good in the Act, and certainly its chief feature, which insists on the possession of competent practical knowledge by chemists and druggists, commends itself to all who desire the advancement of pharmacy. Though the Pharmaceutical Society did not in this Act obtain all that it asked for, its good work in the past and its useful organisation were fully recognised, for to it was entrusted the compilation and maintenance of the official register, as well as the duty of conducting the necessary examinations. It is difficult to imagine what might have happened if public opinion had compelled the legislature to pass a Pharmacy Act, and Parliament had not found an organisation already in existence capable of carrying on the duties necessary to the working of such an Act. It is quite true, and perhaps a little humiliating, to call to mind that most of the continental nations had already laws insisting upon the training and qualification of pharmacists, but their examinations were and are still conducted, and their businesses carried on, under very different conditions from those which we, in our greater love for independence and freedom from direct state control, would be likely to imitate.

As I have before mentioned, the inaugural address to the students in 1868 was delivered by Mr. H. B. Brady, whose name and memory will ever be honoured amongst pharmacists, and whose life was all too short for the cause of science. Words spoken by a man of his eminence must ever remain of value to students of every time, and his thoughtful and eloquent address well deserves to be read by all.

The consideration of the then recent enactment of

the Pharmacy Act led him to make some very valuable remarks on the aspect of pharmacy in its social and ethical relations. He pointed out how with new powers arose increased responsibilities, and he earnestly counselled his hearers to prove themselves worthy of their improved position.

He also mentioned with satisfaction the sympathy of the medical profession generally with the objects of the Act, and this led him to speak on practices which I fear still have a tendency to prevent the complete harmony between that profession and our own which we all so much desire—I refer to “prescribing by chemists and dispensing by doctors,” and I should just like to say a word or two on these points, because I am persuaded they are still subjects of the utmost importance, though I am aware that they require to be treated with the greatest delicacy.

With the largely extended equipment of knowledge now demanded of both the medical man and the pharmacist, it might be hoped that there would be a growing tendency for each to restrict his professional work to that portion of it for which he had been specially trained. Whether prescribing by chemists is on the increase or decrease I do not know, and it is difficult to obtain definite information on the point, but sure I am of two things:—1st. That this Society will continue to set its face against all intrenchments on forms of practice which properly belong to the medical profession, and 2nd, that the more highly trained the pharmacist is for his calling, the less likely he is to overstep the bounds of his legitimate work. Whilst ever willing to make use of his knowledge for the relief of suffering, he will be anxious not to place himself in a false position and assume a responsibility for which his training and education have not qualified him. He will, moreover, set his face against all forms of quackery. Then, as to dispensing by medical men, I fear that this custom is still almost as prevalent as it was in 1868, and though it is in some cases necessary, its discontinuance, where practicable, would be of immense advantage to pharmacists who are complaining of the almost complete want of the work for which they have been specially trained, and would also tend to promote that good feeling between the medical man and the chemist which we all desire so earnestly.

The valuable advice to the students in Mr. Brady's address was focussed in the word “thorough,” which, as has been well said, was the watchword that had long guided his own efforts.

I cannot pass from 1868 without saying a few words about another of our distinguished pharmacists—Mr. Daniel Hanbury—who in this year was President of the British Pharmaceutical Conference which held its meeting at Norwich. In character, surroundings, occupations, and length of life there was a remarkably close resemblance between Brady and Hanbury. Both were connected with the Society of Friends; both were personally engaged for many years in the conduct of historic pharmacies from which they subsequently retired; both held office and did most loyal work for the Pharmaceutical Society; both carried out original investigations of such merit that they were elected Fellows of the Royal Society; and both, alas! died comparatively early, in the prime of their scientific

careers. Moreover, there was in the characters of both a sincerity and a modesty which is delightful to contemplate. Their work and their careers reflect great honour upon the Society of which they were members, and they have bequeathed valuable examples which all may do well to follow.

Still another name stands prominently forth in this eventful year, and I need hardly say that I allude to that of G. W. Sandford, to whose sound judgment and intense loyalty to the best interests of the Society we owe in a great measure the Pharmacy Act of 1868.

Passing on now to the present year, I call your attention first of all to the prospectus of the fifty-third session of the School of Pharmacy. In the introduction we are told that the School has been developed by the Council of the Pharmaceutical Society into an institution affording a complete scientific curriculum for the pharmaceutical student. And the subsequent pages surely furnish grounds for this statement. As professors and lecturers we have men of the highest eminence in their respective subjects, whose names it is not necessary to mention, for they are well known to all who take interest in pharmaceutical education. On looking further into the prospectus we find that chemistry, theoretical and practical, botany, materia medica, and histology, as well as the theory and practice of pharmacy, are taught with such completeness that the question may not unnaturally be asked, has the student sufficient time in a six or ten months' course to take full advantage of all the instruction offered to him?

I think that the answer largely depends on circumstances. If the student possesses good natural abilities, if he has received a liberal general education, if he has been apprenticed to a pharmacist both able and willing to give him a sound practical knowledge of the technical portion of his business, and if, in addition, he has occupied some of his leisure hours in the study of chemistry and botany, or attended courses of lectures on these subjects, then with diligence and perseverance in this school he will not only pass his examinations at the period of the session indicated in the prospectus, but he will be furnished with a fund of knowledge which will be of the highest service to him in the future. The student who does not possess all the advantages I have mentioned will not profit to the same extent by the liberality of the mental fare offered to him, and though he may pass the necessary examinations with more or less credit to himself in the time indicated, I feel convinced that a longer period than ten months at the School of Pharmacy would be of the utmost value to him.

I hope to see the time when, as obtains in most of the continental nations, a compulsory curriculum will be required of all those who present themselves for our examinations. The Council of the Society has during the last eleven years given earnest consideration to this subject. The curriculum clause—or the clause giving power to divide the qualifying examination into parts, and provide for courses of study between those parts—was introduced into the Bill drafted by the Council in 1883, but this draft was not introduced into Parliament. The clause was retained in the 1887 Bill, which was introduced into the House of Commons,

but failed to reach a second reading. The Bill introduced into the House of Lords by the late Earl of Milltown, in 1888, also included the curriculum clause. After amendment in Committee it reached the Commons, but was eventually dropped, owing to opposition and the state of public business. In March, 1889, the Bill, generally referred to as the Curriculum Bill, was re-introduced into the House of Commons, but the second reading was never reached. The Council re-drafted a Bill in 1890 containing the curriculum clause, but it was not till March, 1891, that Sir H. E. Roscoe introduced it to Parliament, where, owing to the lack of support of the majority of registered men and the active opposition of others, it met the fate of its predecessors. This condensed record clearly shows that the Council of the last few years has been earnest in the matter.

Evidence of previous systematic training on the part of examinees would be of great service to the examiners, but to the candidates themselves a compulsory curriculum would be of the greatest advantage. Examinations such as ours are not altogether satisfactory methods of testing the knowledge and capability of candidates, but at present no better plan which can be practically adopted is known. The chief aim of every student should be the acquirement and steady assimilation of scientific principles and methods, and not merely the accumulation of facts, learnt with the primary object of answering the questions of the examiner. A curriculum would compel him to devote a longer time to the period of systematic study, and the knowledge thus gained would be more likely to remain with him, and be serviceable to him in after life.

At a recent meeting of the Congress on University Extension, Lord Salisbury, in the course of an excellent address from the chair, speaking on this subject, said "There are great drawbacks to the excessive use of examination. If the object to be gained is a very considerable one, and is much sought after, examination means merciless cramming. It means an attempt to drive into two or three years the knowledge that should have taken a much longer time. Now that is an old mistake, an old confusion, which we come across so often between mechanical and organic growth. Of course it is comparatively easy to accumulate knowledge in the mind by working ten hours a day and not sparing your health and constitution, if you have them to dispose of; but that is not a healthy growth of knowledge. If you attempted to nourish your bodies in the way in which many people nourish their minds, you would be brought up very quickly. Nature will not stand the food of three years being given in three months."

Then, again, a curriculum would of necessity involve the association of students for extended periods of time. This would have two subsidiary advantages—the promotion of professional feeling and of respect for their common calling, and also the intercommunion of ideas on the subjects of study common to all. Private study is useful and necessary, but study in association with others is still more beneficial.

In a short life of Nathaniel Hawthorne, Mr. Henry James, jun., speaking of this distinguished man's earlier years, which were spent somewhat in isolation from the stimulating influence of those

of kindred tastes, says:—"The best things come, as a general thing, from the talents that are members of a group; every man works better when he has companions working in the same line, and yielding the stimulus of suggestion, comparison, emulation. Great things have been done by solitary workers, but they have usually been done with double the pains they would have cost if they had been produced in more genial circumstances. The solitary worker loses the profit of example and discussion; he is apt to make awkward experiments; he is in the nature of the case more or less of an empiric." These remarks were made with reference to the career of a literary man, but I think they apply with equal force to students in other professions.

But, although we have as yet no compulsory curriculum, our research laboratory offers to the advanced student the opportunity of continuing his studies, and of carrying out under very favourable conditions original investigations.

The institution in recent years of the research laboratory is yet another proof of the desire of the Pharmaceutical Society to be in the van of educational progress, and it is gratifying to find that the wise and liberal policy which advocated its foundation, and has since fostered its growth, has been sympathetically recognised not only by individual leaders in the scientific world, but also by the Royal Society and other learned societies. As the latest proof of the value attached to the investigations conducted in this laboratory may be mentioned the founding during the present year of a Research Fellowship of £100 a year by the Salters' Company.

We have now rapidly reviewed some of the leading incidents directly or indirectly connected with the educational work of the Society during the last fifty-two years, especially at the three periods mentioned, and we may confidently say that the Pharmaceutical Society has nobly and liberally carried out its purpose of "advancing chemistry and pharmacy."

We have also noted with satisfaction that the Society's efforts have been cordially recognised by those who are best able to appreciate the value of educational progress. The granting of the Royal Charter of Incorporation soon followed the foundation of the Society's School, succeeded in turn by Acts of Parliament in 1852 and 1868, whilst at the present time we have evidence of the goodwill of such important and representative bodies as the Royal Society, the General Medical Council, and the Salters' Company.

No one, moreover, would venture to assert that this work has not in the main been highly beneficial, but there are, I believe, some who maintain that the Society has taken an unnecessarily high standard for its educational work and for its examinations, bearing in mind the too frequent character of the business in which a large proportion of our qualified men are subsequently engaged.

There can be no doubt that pharmacists are passing through very trying times, but I suppose that each generation is apt to magnify its own special difficulties. We look back, perhaps, with some regret on days of more general prosperity, when there were no limited liability companies and cutting stores dabbling in pharmaceutical opera-

tions, when proprietary medicines and nostrums were less frequently prescribed by the medical profession, when at least the beauty of our fields was not disfigured by the enterprising advertiser of quackeries, and when there was less of the so-called elegant pharmacy, which, though frequently a distinct advance, too often necessitates the purchase of factory-made products, whilst official preparations lie undisturbed on the pharmacist's shelf.

But, in addition to these changes, many of them inimical to chemists' interests, there are others which cannot fail to be regarded as highly beneficial to the community, and of which the skilled pharmacist should be prepared to take full advantage.

For example, medical science has undoubtedly made immense advance during the years which we have been considering, and in no direction has this advance been more manifest than in the improved and ever increasing acquaintance with the causes of disease. Arising from this increased knowledge, more careful consideration is given in every direction to all sanitary and other means that may be adopted as preventives of disease, resulting in great benefit to the general health. The pharmacist, bearing this in mind, should aim to keep himself abreast of all matters directly or indirectly connected with sanitary science, and so be in a position not only to aid the physician in the combat with disease, but also to render valuable service to his fellow-creatures, and at the same time improve his own position both financially and socially.

In this, or in some other equally useful direction, the pharmacist of the future will probably have to turn his attention, particularly if the work for which he has been specially trained, and in which his very title stamps him as an expert, is not more liberally entrusted to him. I think it probable that before very long the medical profession and the public will learn to recognise more clearly the essential difference between high class pharmacies conducted by qualified men almost exclusively occupied in pharmaceutical operations, and stores established for the supply, on purely trade lines, not only of medicines and drugs, but also of every requirement of daily life.

But what can be done to hasten this improved condition which we all so much desire? The only two means that I can suggest are individual excellence and corporate loyalty. I think I have shown that, as a corporate body, the Society has from its foundation continuously encouraged advanced education, and that recognition of its efforts has invariably followed. May we not, therefore, hope that, as in course of time considerable scientific acquirements are the possession not only of the few, but also of the great mass of pharmacists, a more generous recognition will be granted by the public?

Then as to corporate loyalty—involving some form of combination and co-operation for mutual defence and the advancement of interests common to all its members. The Pharmaceutical Society was founded not only for the advancement of education, but also for the "protection of those who carry on business as chemists and druggists." Is it not strange then that such a large proportion of registered men hold aloof from connection with it? And is it not still more strange that many who have been educated in its school and have, as it were, eaten of its bread,

should turn their backs on it when once their examinations are passed?

I trust that all the students whom I am addressing will become loyal and energetic members of this Society, and that many will be able to render it important services. Do not listen to those who raise the *cui bono* cry, and say that the Society does nothing for trade interests. The Society has done excellent work in the past, and that in spite of the lukewarmness of some of its members and the hostility of many who remain unconnected with it, but far different results would have followed if all had loyally combined for the common good. And recollect that the policy of the Council is the expression of the views of the members. The success of that policy largely depends on the measure of active support received from all those whose interests are involved.

And now I have left myself very little time to offer you any suggestions as to the way you may best utilise your opportunities whilst working here. I regret this the less because I am conscious that I am not specially qualified to give you advice on this point. But I may, perhaps, first of all congratulate you that circumstances have permitted you to become students in this excellent school. The object of its professors is not only to convey to you in the most interesting and instructive way the knowledge of the sciences on which the practice of pharmacy in its widest sense depends, but also to train you in the best methods by which you may continue the pursuit of science in after life. There is an old saying that "there is no royal road to learning," and if the learning is worth the name, the saying is still true. We are living in days when science is making immense strides in every direction, and it is all the more necessary, as time is still limited, for the student to concentrate some of his attention on those departments which offer to him the greatest attractions, or to those which will be the most serviceable to him in the future.

These are days also when the pursuit of science is made very attractive, when more than ever "of making many books there is no end," and when every facility is given for the acquirement of superficial knowledge. Herein there is no little danger, and it is therefore all the more necessary that the student should cultivate the habit of thinking for himself, and conquering difficulties as they arise without a too hasty and too frequent resort to his text-books. The acquirement of this habit will enable him more readily to make practical application of his knowledge, and so be in a better position to solve the problems and overcome the difficulties of after life. Generally, the most successful men are not those whose memories are stored with the greatest number of facts, but those who are able to utilise and apply the knowledge they have patiently acquired in earlier days.

It is needless for me to add that diligence and perseverance are as much needed as ever to ensure success, either in this school, at the examination table, or in business life.

You will necessarily utilise most of your time outside the laboratory and lecture theatre in private study, but you will do wisely to take personal interest in the meetings of the School of Pharmacy Students' Association, where you may acquire the habit of expressing your ideas with ease and accuracy.

Your physical as well as your mental powers will require exercise. May I suggest that those of you who are able should become active members of the school football and cricket clubs? The association for recreative purposes of those who have many interests in common is very beneficial, and often leads to lifelong friendships.

Finally, in the name of the Council I congratulate not only those who have taken prizes this afternoon, but also those who, though unsuccessful in this respect, have done good and honest work. I trust that all the students of the last and present sessions have before them a future in which both they themselves and the Pharmaceutical Society will have cause to rejoice.

POISONOUS PLANTS OF SOUTH AFRICA.

J. Medley Wood, the Curator of the Durban Botanic Gardens, has recently issued notes on local poisonous plants with the view of making them better known, and so preventing accidental poisoning by them. The following are some of the plants mentioned:—

Lasiosiphon anthyllioides, Meisn.—The roots are very acrid, like Mezereon and other plants of the same order (*Thymelacae*) to which it belongs. It has bright yellow flowers, in terminal clusters, very conspicuous, and sweetly scented in the evening. Unlike the Mezereon it has ten stamens, and there are five scales alternate with the lobes of the perianth. The roots are said to be used by the natives as an antidote for snake bites, but great caution is observed as to the quantity administered.

Lichtensteintia interrupta, E. M.—An umbelliferous plant, the root of which is used by the natives as a remedy for colds. Dr. A. Smith (of Lovedale) says it certainly has the power of giving an immediate headache.

Combretum bracteosum.—The fruit of this plant is locally known as the "hiccup" nut, and by the natives as "Umandawa." The plant is a climbing shrub with ovate leaves and terminal spikes of dull red flowers. The fruit is an oblong nut with a pleasant flavour, but causes violent hiccup if only a few are eaten. At one time Mr. Wood tried them on himself, and did not care to repeat the experiment. An allied species, *C. erythrophyllum*, Sond., known as "Umduba," distinguished by its papery four-winged fruits, and its leaves turning almost white before flowering, but reddish in the autumn, is stated by Mr. J. Kirkman to be used as a medicine by the natives in the dose of $\frac{1}{2}$ oz. or less, but an overdose causes death.

Tephrosia macrocarpa, E. M.—This leguminous plant, known to the natives as "Ityozaan," is not uncommon in the colony of Natal. The roots are used for stupefying fish, and for freeing dogs from vermin.

Phytolacca striata, Hoffm.—In the Cape Colony this is known as the "wild sweet potato." Dr. A. Smith says that three brothers had been eating a portion of the tubers when out in the field, and were poisoned. They were recovered by giving them an emetic, though one of them was in a state of collapse. An allied species, *P. abyssinica*, is used medicinally by the natives.

Acokanthera venenata, Don.—All parts of the plant

are more or less deleterious. It is known to have formed the chief ingredient used by the Bushmen for their arrow poisons.

A Bushman in the employ of Colonel Bowker stated that it is prepared as follows:—The bark is pounded between stones, boiled for some time with water, then strained and the water again boiled until a jelly is formed, into which the point of the arrow is dipped. Dr. Andrew Smith says that a little fresh juice of *Euphorbia* is added after boiling, and that no snake poison or other substance is used. He also says that in the Transvaal the poison is extracted from the fruits, and that it is more abundant in the seed. The plant has also been used by the natives for snake bites and medicinally in other ways, and Dr. A. Smith cites two fatal cases which followed its use. Mr. Wood believes that *A. spectabilis*, which has larger, white, fragrant flowers, and much larger, oval, black fruits, about the size of a cherry, is also poisonous.

Buphanedisticha, or *B. toxicaria*.—This bulbous plant, known to the natives as "Incwadi," has the reputation of being poisonous, and is reputed to have been one of the ingredients used by the Bushmen to poison their arrows. It has also been used as a remedy for "redwater" in cattle.

Hemantthus natalensis.—Another bulbous plant, the fruit of which forms a globose red berry, is also reputed to be poisonous. Hemlock, stramonium, and the physic nuts (*Jatropha curcas* and *J. multifida*) are also enumerated amongst the poisonous plants of the colony.

TRADE OF BAGHDAD AND BUSSORAH. GALLS.

A large stock came to market during 1893, principally carried forward from 1892, and over 10,000 bags were shipped to London and Continental markets, principally to the former. Average price in the beginning of the year was about £12 5s. 7d. per cantar of 223 okes (about 640½ lbs.). The new season's crop which began to come forward in October, was also sold at such price to commence with, but fell to £11 16s. 9d. before the close of the year, and greater part of the crop was still on hand at the end of the year, owing probably to depression existing in French silks, for the dyeing of which this nut is largely used.

GUM TRAGACANTH.

The imports were very large, and between 6000 to 7000 cases were shipped during the year, principally to London, but owing to the absence of demand in the home markets not much business was done until the year was well advanced, and at the end of it some 400 or 500 cases remained unsold. This article comes from Kermanshah, Barna, Kurdistan, and Sulimania.

LIQUORICE ROOT.

There are many enquiries for the low quality available in this country, but the trade might be made a valuable one were greater care bestowed on the drying and preparation of the root for shipment. It grows wild in many parts of the country on the banks of both the Tigris and Euphrates, and can be obtained at cost of the labour required to collect it.—*Consular Report.*

CINCHONA CULTIVATION IN BRITISH INDIA.

In a recent report of the Indian Government, it is stated that on the Government plantation of the Darjeeling district in Bengal there were, at the end of the year 1892-93, 4,331,000 cinchona trees, or 100,000 less than in the preceding year. Of the existing trees, nearly four-fifths are of the pure quinine-yielding variety, and less than one quarter belonging to the cinchonine-yielding variety. During the year 466,000 trees were uprooted for their bark, or died, while 184,000 were planted out; all the new plantations have for some years past consisted of quinine-yielding varieties. The harvest of dry bark was 304,000 lbs. The factory produced during the year 3481 lbs. of cinchona febrifuge, and 5242 lbs. of sulphate of quinine. Quinine is now sold to public institutions and Government offices at one rupee per ounce, while the febrifuge is sold at ten annas per ounce. The issues from the factory were 3647 lbs. of febrifuge and 5518 lbs. of quinine. The sales and issues of medicine during the year yielded a profit, after meeting all charges for maintaining the plantations, renewing plant, and working the factory. As soon as the remaining million of red bark trees are used up, it is intended to manufacture only quinine, and to cease making cinchona febrifuge at the Darjeeling factory. The capital cost of the plantation had been repaid by the sale of cinchona drugs in previous years. During the year 1892, 475 lbs. of quinine were put up in 5-grain doses; each dose is carefully packed, and bears simple instructions in one of the vernacular languages of Bengal. The packets are made up in the jail department, and they are issued to local postmasters, who, for a small commission, retail them to the public at one pice (one farthing) per packet, or dose. As yet, the arrangement has been made for Bengal only; when it is extended to the provinces, the demand for quinine thus brought in convenient shape, and in an absolutely pure state, to the doors of the people, is expected to increase indefinitely. Ample ground has been reserved for extending the Darjeeling plantations. In the Government plantations on the Nilgiri hills, in Madras, the cinchona trees are almost all of the quinine yielding varieties. Drought, and the absence of sunshine, made the year 1893 unfavourable for cinchona cultivation on the Nilgiri hills. The stock of dry bark in hand at the beginning of the year was 416,000 lbs.; the harvest of the year was 119,000 lbs.; the consumption of the factory was 172,000 lbs.; and 2000 lbs. were issued in the shape of bark. The produce of the factory during the year was 4933 lbs. of quinine and 8139 lbs. of cinchona febrifuge; 3204 lbs. of the former and 2600 lbs. of the latter were sold or issued to Government and municipal or local departments. The number of quinine powders issued to the public by collectors of districts rose to 170,000, from 37,000 in the previous year. The area under cinchona on private plantations outside Bengal is returned at 10,862 acres, nearly all of which are in Madras. The exportation of cinchona bark from India by sea, which was 3,074,000 lbs. in 1888-89, and 2,693,000 lbs. in 1891-92, rose to 2,814,000 lbs. in 1892-93.—*Journ. Soc. Arts*

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, OCTOBER 6, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge,—17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

THERE was a very full attendance of members of Council at the meeting last Wednesday, when the business proceedings of the coming session were commenced after the vacation.

The reports of the Finance and Benevolent Fund Committees did not contain any unusual features, and the chief business transacted had reference to the administration of the Benevolent Fund. On the recommendation of the Benevolent Fund Committee two grants of thirteen pounds each, one of six pounds, and one of five pounds, were ordered to be paid, and the Secretary reported that it was proposed to add to the forty-five annuitants now on the list four more to be elected next December. From consideration of the cases of applicants for annuities whose names have already been placed on the provisional list of approved candidates, and those of applicants during the present year, seven candidates were selected by the Committee. In moving the adoption of these recommendations the Vice-President expressed regret that it was not in the power of the Committee to recommend the grant of a larger number of annuities. He pointed out that there is no deficiency of eligible and deserving candidates, but that the limitation of the number of additional annuitants recommended is a necessity entirely arising from want of means to do more. In making an addition of four annuitants, the available means of the Benevolent Fund are actually insufficient for the payment of the annuities. The income from the capitalised fund being insufficient for that purpose, the Committee has made its recommendation upon trust and in the anticipation that it will be supported by the generosity of subscribers. Hitherto that has been the case to such an extent that there is good reason

for being proud of the Fund as a means of relieving the necessities of their less fortunate brethren. If the Committee were in a position to grant more annuities the capability could be advantageously exercised, and in reference to this point Mr. CROSS stated that he had been struck by the very generally entertained opinion that cases of distress should be relieved in that manner by the Pharmaceutical Society. He hoped, therefore, that increased subscriptions would come in during the next twelve months, by which the Committee would be enabled to provide for further annuities, without interfering with its power to render assistance by grants for special emergencies.

Some discussion took place in consequence of a remark by Mr. HAMPSON in reference to the present method of election, which he regards as objectionable. Without desiring to re-open that question he suggested that members of Council should individually abstain from exerting their influence in favour of any particular candidate for an annuity. Mr. RYMER YOUNG stated that he was in full sympathy with Mr. HAMPSON in regard to this matter, and thought that the Council would have no difficulty in selecting the cases having the strongest claim upon the Fund so as to relieve the candidates from the expense of canvassing now requisite, and some of them from the disappointment arising from failure. Mr. HARRISON also gave expression to his sympathy with the sentiment of these remarks, but characterised the suggestion made by Mr. HAMPSON as illogical. Though agreeing with him that the selection of annuitants should be left entirely in the hands of the Council he was not disposed, as a member of Council, and therefore one of those who best knew the circumstances of the different cases, to abstain from giving effect to the influence he could thus exercise in promoting the success of particular candidates. For the same reason he would be indisposed to refuse advice to voters who very frequently applied to him for information as to the most deserving cases. It appears, indeed, as remarked by Mr. HILLS, that Mr. HAMPSON's suggestion, if fully carried out, would actually have the effect of preventing individual members of Council from using their votes in an election. In fact, the objection to the method by which annuities are obtained—though estimable for its motive—is founded too much upon regard for abstract principles of justice to be applicable to existing conditions. It is more in consonance with a state of affairs in which the equally objectionable injustice of poverty or distress would be itself non-existent. The impossibility of granting annuities to three out of the seven candidates who have been selected is in itself an injustice to them, but being unavoidable it is no more an injustice than the necessity which

makes all the seven candidates anxious to be elected. Would not some, if not all of them, think it a still greater injustice to be denied a chance of election, and debarred from seeking the assistance of friends in furtherance of the object they have in view? As Mr. ATKINS pointed out, the necessary failure of some of the candidates and the exclusion of others from the recommended list are matters apart from the motion that was before the Council, and like the struggle between candidates, they must be accepted as inevitable concomitants of the evil which the Benevolent Fund is intended to mitigate. In addition, it must be remembered that the desire of many subscribers to the Fund to make it of service in the relief of cases they are specially acquainted with and take interest in is a circumstance of great importance. There is great reason for the opinion expressed by Mr. ATKINS, that if the power of voting were done away with many subscribers would lose interest in the Fund, and in time cease to contribute to it.

In connection with the receipt of an official report by Mr. HENRY CRAIK on the subject of the leaving certificates given by schools in Scotland, the PRESIDENT drew attention to the circumstance that these certificates are now being accepted by many authorities in the place of the preliminary examinations previously held by them. He hoped that in time these certificates would be taken advantage of by pharmaceutical candidates.

In mentioning the resignation of Mr. LAWRENCE RUSSELL as Local Secretary at Windsor, the PRESIDENT requested the Council to authorise his writing to express regret at his retirement and thanks for his long services to the Society.

In reference to a letter from Mr. BRAXTON HICKS, the coroner for the South-Western district of London, enclosing a recommendation for regulation of the sale of carbolic acid, it was decided that Mr. BRAXTON HICKS should be referred to the Privy Council.

The report of the General Purposes Committee gave a statement of the progress made with cases relating to the administration of the Pharmacy Acts. A large number of penalties have either been paid or recovered under judgment. Several cases are still to be tried, and proceedings were ordered to be taken in other cases.

• ANTIDIPHTHERIC SERUM.

ONE of the subjects exciting the greatest interest at the meeting of Naturalists and Physicians at Vienna last week was the treatment of diphtheria by means of a prepared serum. In a paper read by Dr. BEHRING, the opinion was expressed that the preparation of serum for the purpose should be undertaken by the State, under the direction and control of the sanitary authorities. It was stated that among children the mortality from diphtheria, amounting now to 240 in 10,000,

might thus be reduced to one-third of that rate. Dr. EHRICH spoke of this method of treatment as one of the most important results known in the history of medicine, and he stated that trials made in the Berlin children's hospitals showed that without the use of serum there were twenty-five deaths out of seventy-two cases, while there were only two deaths out of seventy-eight cases treated with serum during the first two days of illness. Anti-diphtheritic serum is therefore likely to become an article in demand for medical use, and pharmacists will require to provide for the supply of it.

THE OPENING OF THE SCHOOL OF PHARMACY.

IN the inauguration of the fifty-third Session of the School on Wednesday last, a reversion was made to the former practice of entrusting the delivery of the Address to Students to a prominent member of the pharmaceutical body, and it was a fortunate circumstance that on this occasion the delivery of the address should have been undertaken by Mr. WALTER HILLS. His position as the representative of an historic house which was so intimately connected with the origin and establishment of the Society, and has always continued to be the source of important influences in promoting the objects with which it was founded, gave additional interest to his retrospective view of the past work of the Society as an educational body and as an organisation for pharmaceutical advancement.

From both points of view Mr. HILLS' address may be read with profit by both old and young connected with the business of pharmacy, and we commend it to their careful consideration. The remarks of Sir RICHARD QUAIN in proposing a vote of thanks to Mr. HILLS for his address, and those of Sir ALFRED GARROD in seconding the motion were of a nature not only calculated to be gratifying to him, but servicable in showing the high estimation in which the Society's work is held by leaders in the medical profession, and the just appreciation entertained by them of the proper relations between medicine and pharmacy.

MEDICINE STAMP DUTY.

FROM the thirty-seventh report of the Commissioners of Inland Revenue, which has just been issued, it appears that there has again been a decrease in the amount of revenue from medicine stamps to the extent of £7115 as compared with the receipts in the previous year, when the decrease in the revenue from that source amounted to £19,737. The duty paid for medicine stamps still amounts to the large sum of £213,210, and the number of licensed vendors in the United Kingdom to 29,364.

DEATH OF AN ANNUITANT.

WE regret to have to announce the death, at the age of 74, of Mrs. ANNE HURRY ROSSITER, widow of the late JOHN ROSSITER, chemist, formerly of Notting Hill, and daughter of the late JOSEPH GIFFORD, President of the Society (1852-1853). Mrs. ROSSITER was elected an annuitant on the Benevolent Fund in 1886.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, October 3, 1894.

Present—

MR. MICHAEL CARTWRIGHT, PRESIDENT.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Abraham, Allen, Atkins, Bottle, Gostling, Greenish, Hampson, Harrison, Hills, Johnston, Martin, Newsholme, Schacht, Southall, Storrar, and Young.

The minutes of the last meeting were read and confirmed.

ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Couper, Frederick Thomas Edinburgh.
Jennings, Henry Geo. H. Bulwell.
Openshaw, John Wm. W. Lower Darwen.
Robinson, Edward George Lincoln.
Sutherland, John George Sunderland.

ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Allison, Joseph Wm. W. Cockermouth.
Bannister, Frank Ewart Netherton.
Buchanan, Alexander G., jun. Govan.
Charlesworth, Charles E. Manchester.
Cox, George Frecker Guernsey.
Cruse, Harry Douglas London.
Day, Arthur Boston.
Duncan, Robert Fortrie.
Gayton, Ethel Hampstead.
Harvey, John Constantine.
Hogarth, John Tom Choppington.
Jones, Edward Rhys Oswestry.
Lee, Harry L. Bridlington Quay.
Mason, Ernest Noel Bexley Heath.
Ricardon, Joseph Marius London.
Stratton, William George Uckfield.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

RESTORATION TO THE REGISTER.

The name of the following person was restored to the Register of Chemists and Druggists:—

William Jones Williams, 13, Arthur Road,
Holloway, London, N.

THE INTERNATIONAL CONGRESS OF HYGIENE AT BUDAPEST.

The PRESIDENT read the report which had been written by Dr. B. H. Paul, who was appointed delegate to represent the Pharmaceutical Society of Great Britain at this Congress. He stated that he had received a most friendly and hospitable reception, both from the officials of the Congress and individual members. Much satisfaction was expressed that the British Society had sent a representative, and at the proceedings of the pharmacy section, which was constituted for the first time, he was appointed honorary president of the section. He also took the opportunity of reporting that he had attended the meeting of the German Apotheker Verein at Cassel, where he also received a hearty welcome.

The PRESIDENT added that he was sure the Council would feel great satisfaction in hearing that their representative had been so well received, both in Germany and at Budapest.

REPORT OF FINANCE COMMITTEE.

The report of this Committee was of the usual character, and recommended the payment of sundry accounts.

The PRESIDENT (as Chairman of the Committee), in moving the adoption of the report and recommendations, said it contained nothing special to which attention need be called. The receipts and payments were of the usual character. With respect to the Benevolent Fund, they did not at this time of the year expect to receive many ordinary subscriptions, but a sum of £11 had come, as well as a donation of ten guineas.

The report was then put and adopted.

REPORT OF BENEVOLENT FUND COMMITTEE.

The report of this Committee included the recommendation of the following grants:—

£13 to be placed in the hands of the local secretary for a registered chemist and druggist (65) who has had two previous grants of £13 each. (Landport).

£13 to the widow (60) of a member and subscriber to the Fund. (Motherwell, N.B.).

£5 to an associate (52), who had a similar grant in January, 1893. (Wrexham).

£8 to a registered chemist and druggist (86), and subscriber to the Fund. He has had two previous grants of £5 each. (Liverpool).

One case the Committee had declined to entertain.

The Secretary submitted a statement with regard to the annuitants, showing that in October, 1893, there were forty-four on the list, and four were added in December.

One annuitant had died during the year, and two had resigned, leaving on the list forty-five. The Committee had recommended that four more annuitants be elected on Tuesday, December 11.

Having considered the cases of applicants whose names had been placed upon the provisional list of approved candidates for an annuity since the last election, as well as those of other applicants during the year, the Committee had recommended that the following, who had been deemed to be the most necessitous, be placed on the list of approved candidates for election in December next:—

Board, Thos. F. (66), Cheltenham.

Troughton, Christopher (78), Liverpool.

Willison, Elizabeth A. (58), Bath.

The following were the unsuccessful candidates at the last election:—

Bromfield, Chas. (72), Exeter.

Ellis, Elizabeth (60), Burnham (Essex).

Kershaw, Ellen (64), Wheathampstead.

Watson, Jas. B. (86), Chipping (Lanc.).

The VICE-PRESIDENT (as Chairman of the Committee), in proposing the adoption of the report, drew the attention of his colleagues, and through them that of chemists throughout the country, to the case of Miss A. Wells, aged 58, who was seeking an annuity at the hands of the United Kingdom Beneficent Association. She was the eldest daughter of Mr. W. Wells, who for upwards of fifty years was a well-known and respected inhabitant of South Acton, where he carried on a chemist's business. He was a well educated man, having been brought up at Eton, and was universally respected; but he was unfortunate in business, and at his death left a family almost wholly unprovided for. Miss Wells, since his death, had worked in a hard and most praiseworthy manner, but with advancing years and in failing health had

been compelled to apply for assistance. Her case was recommended by, amongst others, the Lord Bishop of Quebec, the Rev. J. McArthur, Dr. Vine, Henrietta Street, Covent Garden, and others, and as he found on looking through the list of subscribers to the Beneficent Association the names of several residents in his own town whom he should solicit for their support, he thought it probable that other chemists might have a similar experience, and with their united aid he trusted Miss Wells would be successful in her application.

The PRESIDENT said it might be as well to explain that Miss Wells was ineligible for assistance from their own Fund because she was not an orphan "child."

The resolution was then put and carried.

The VICE-PRESIDENT then moved that four additional annuitants be elected on the Benevolent Fund, and that the election take place on December 11. He wished the Committee could have recommended that a larger number be elected. It was not for want of eligible candidates that the number was restricted, but simply from lack of funds. It was wonderful how ready everybody was when they knew of a case of distress to recommend that the Pharmaceutical Society should be applied to for an annuity, and it could not be disputed that many more annuities ought to be granted if there were the means of doing so. Still they were proud of the Fund, and were pleased that the faith placed in the members as a whole had been so far justified. The income from their invested capital would nothing like provide the amount required, but subscriptions had come in, and he hoped would come in during the next twelve months on an increasing scale, so that the annuities might be provided for without diminishing the casual grants.

Mr. SCHAUCH seconded the motion.

Mr. HAMPSON said he should have liked to elect the entire number of eligible candidates, and to have done so without the process of voting, and though this was impossible, at any rate he thought the four might have been elected in a manner which would be above all suspicion, viz., by the Council itself; but inasmuch as the abuse, as he considered it, still remained, he supposed the usual method must be adopted. He would not attempt to reopen this question now, but he would venture to suggest that members of the Council should not allow their names to be used on the cards and circulars of individual candidates. Some years ago he made a similar suggestion, and some members then agreed that it was not a wise thing to do, and that members of the Council should not throw their weight in any particular direction. While these miserable struggles went on he thought they ought to let the unfortunate candidates and voters fight it out amongst themselves.

Mr. YOUNG said the method of selecting annuitants had been so recently before the Council that it was perhaps hardly right to raise the question again; at the same time he must express his sympathy with the tone of Mr. Hampson's remarks. It seemed to him that the Committee, which last night had no difficulty in weeding out four or five cases which were weaker than the others, would have had no difficulty either in selecting the four which were the strongest. These seven selected candidates would be put to a considerable amount of expense, and some of them to disappointment, and he could see no earthly use in it. As the Vice-President had said, the number to be elected had to be regulated not by their sympathies but by the amount of funds in the Treasurer's hands.

Mr. HARRISON, while sympathising with Mr. Hampson's remarks as to the mode of election, thought he took up a somewhat illogical position in the suggestion he had made. He contended—and there he agreed with him—that the election should be left in the hands of the Council, and yet he

objected to those who best knew the circumstances of the different cases giving any assistance to the voters at large. Very often subscribers applied to him for information as to which candidates were most deserving of support, because they themselves had not the means of ascertaining the circumstances fully, and he had always responded readily to such applications, but if he were to take the hint Mr. Hampson had given, and carry it to its logical conclusion, he must tell his friends to look through the papers and act on their own judgment. He was not disposed to act in that way. Like previous speakers he regretted that the whole of the candidates could not be elected, and it was a serious disappointment to him that two eminently deserving cases had had to be excluded simply from financial considerations. He could not help feeling that, if chemists generally would only ponder on the amount of good which might be done by increasing their subscriptions, they would come forward more liberally, and they would not then have to exclude deserving cases from the consideration of the voters. He trusted this matter would be considered by the craft, and that larger funds would soon be placed at their disposal.

Mr. ATKINS said the exclusion of two or three cases from the recommended list had nothing to do with the question immediately before the Council. He thought the question of the mode of election had better rest for another year, and did not wish to place himself in any antagonism to the extremely generous view taken by the Treasurer, but he felt sure that whenever they did venture on the experiment which he recommended, he would himself be startled at the number of persons who would withdraw their subscriptions when they lost their votes. The Vice-President had that morning invited chemists to assist in any way they could in the election of a lady to an annuity from the Beneficent Society, and this could only be done by canvassing. Some years ago he was interested in a similar case, and the labour which he and his wife had to undergo was almost herculean. Surely they were not to withhold their influence entirely from the election. He had never allowed his name to be placed on a card, but it was almost a distinction without a difference to abstain from that and yet use one's influence personally or by letter. As long as human nature was what it was, and as long as other institutions were worked as they were, he feared it was utopian to attempt to hold their hands entirely, and thought that it was quite fair for any gentleman to give advice as to the most deserving cases.

Mr. GOSTLING, whilst for the last twelve years loyal to the suggestions made with regard to candidates, thought the Council should take a neutral position in these matters.

Mr. HILLS agreed with Mr. Harrison, that it was undesirable members of the Council, as subscribers to the Beneficent Association, should have their names recorded on the cards for promoting the selection of any one candidate; but to carry this view to its logical conclusion they ought not to use their votes at all. He thought, therefore, that individual members of the Council might legitimately use their influence in promoting the cause of any candidate they thought preferable to another.

The report was then put and carried.

CORRESPONDENCE.

The PRESIDENT announced the receipt from the Government of an official copy of the report for 1894 of Mr. Henry Craik, C.B., with respect to the inspection of higher class schools, and the examination for "leaving certificates" in secondary education in Scotland. The Inspector referred to the fact that a number of authorities had announced their readiness to accept the leaving certificate in lieu of such preliminary examinations

as are held under their directions, including the War Office and the Civil Service Commissioners, the Universities of Oxford and Cambridge, the joint Board of the Scottish Universities for the preliminary examination, the General Medical Council, the Royal College of Surgeons of Edinburgh, the Society of Solicitors before the Supreme Courts, and other bodies. These certificates he (the President) regarded as extremely valuable, and he hoped the time was not far distant when their own candidates would take advantage of them : Like all Scottish educational work, this report was admirably done, and well deserved their consideration.

RESIGNATION OF LOCAL SECRETARIES.

The PRESIDENT also said he was sorry to report that a letter had been received from Mr. T. Blackshaw, of Burslem, resigning the position of local secretary to this Society on the ground of ill-health. The appointment of a successor was being considered.

Mr. C. J. L. Russell, of Windsor, had also resigned a similar position, as he was leaving the neighbourhood. He (the President) had for a great many years enjoyed the friendship of Mr. Russell, who was formerly one of their students, and whom he had long regarded as a type of gentleman who reflected credit on himself and on the profession to which he belonged, and as a proof that an educated man could and must succeed in life. At the close of what he trusted had been a fairly successful career, both to himself and his family, he hoped the Council would allow him in its name to write to Mr. Russell expressing regret at his retirement, and thanks for his services to the Society through many years.

The PRESIDENT likewise read letters from Mr. H. A. D. Jowett thanking the Council for his appointment as Assistant Lecturer in Chemistry in the School, and from Mr. T. Tickle in recognition of the grant of £45 from the Manchester Pharmaceutical Association Scholarship Fund, to enable him to continue his work in the Research Laboratory ; he also thanked the President of the Manchester Pharmaceutical Association and the founder of the scholarship, the more because he did not belong to the district for which the scholarship was intended.

POISONING BY CARBOLIC ACID.

The PRESIDENT said he had received a letter from Mr. Braxton Hicks, Coroner, with reference to an inquest held at Wandsworth on September 24, in which death had taken place from carbolie acid poisoning, enclosing a rider to the verdict of the jury, recommending that carbolie acid should be placed under the restrictions applying to poisons included in the second part of the schedule, and that it should only be sold in distinctive bottles. He would write to Mr. Braxton Hicks, pointing out that his proper course was to address the Privy Council.

REPORT OF GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitors stating the progress made with legal cases placed in their hands. A large number of penalties had been paid by or recovered from various defendants. Several cases are awaiting trial.

A large number of cases of infringement of the Pharmacy Acts were reported to the Committee, and proceedings were recommended.

This report was read and considered in committee as usual.

On resuming, the report and recommendations were adopted, and special resolutions were also passed, authorising the Registrar to take proceedings against the persons named.

OPENING OF THE SOCIETY'S SCHOOL OF PHARMACY.

The fifty-third session of the School of Pharmacy was inaugurated on Wednesday, October 3, the chair being taken at three o'clock by Mr. Michael Carteighe, President of the Pharmaceutical Society.

The Dean of the School, Professor GREEN, was first called upon to read his report on the work of the past session, as follows :—

Report on the School of the Pharmaceutical Society for the Fifty-second Session, 1893-4, by the Dean of the School, Professor Reynolds Green.

The number of students attending the School of Pharmacy during the session has been eighty-three, about the average number for the past ten years.

In the department of Chemistry, Professor Dunstan reports that there were forty seven students. The work of the class throughout the Session was satisfactory in every respect. At the examination in March the Bronze Medal was taken by Mr. C. J. Taylor, and Certificates of Honour by Mr. Henry (the Bell Scholar), and by Mr. A. T. Hill. At the examination held at the close of the session in July, the Silver Medal was awarded to Mr. Henry (Bell Scholar), whilst Certificates of Honour were taken by Mr. Ashby (Bell Scholar), by Mr. T. Jackson, and by Mr. A. T. Hill.

The Silver Medallist, Mr. Henry, has since been elected by the Council Redwood Scholar in the Research Laboratory.

In this department Mr. H. A. D. Jowett, B.Sc. Lond., has been appointed by the Council an Assistant Lecturer, to succeed Mr. E. F. Harrison, who resigned at the end of last session. During the present Session the teaching of Physics will be extended especially in the direction of practical demonstrations in the use of physical instruments, new apparatus having been recently provided for this purpose by the Council. Considerable encouragement has been given to chemical investigation in Pharmacology by the liberality of the Salters' Company, which has founded, in connection with the Research Laboratory, a Research Fellowship in Chemistry of the annual value of £100.

Professor Atfield reports that sixty-three students worked in the Society's laboratories during the session, most of them for three hours daily during an average period of between six and seven months. The records relating to the daily work of each student, and to the result of the Professor's weekly revision classes as well as to the Professor's and demonstrators' system of marking the amount and quality of the work accomplished, indicate an average session. The Council's Bronze Medal and two Certificates of Honour, at the end of the winter course, were taken respectively by Charles John Taylor, Aubrey Thomas Hill, and Charles Edmund Ashby. The Council's Silver Sessional Medal was won by Charles Edmund Ashby, and the three Certificates of Honour by Thomas Anderson Henry, Charles John Taylor, and Arthur Lander.

In the department of Botany thirty-nine students attended. With few exceptions the work was done well throughout, Messrs. Hill, Henry, Ashby, and

Taylor being worthy of special commendation. The bronze medal at the end of the first course and the silver medal at the end of the session were both won by Mr. A. T. Hill, but in both cases he was hard pressed by the other three. The certificates of honour at the end of the first course were awarded to Mr. C. J. Taylor and Mr. C. E. Ashby, and those at the end of the Session to Mr. T. A. Henry, Mr. C. E. Ashby, and Mr. C. J. Taylor.

Professor Greenish reports that thirty-seven students attended the first course of lectures on *Materia Medica*, and twenty-four the second. During the whole session, and particularly during the second course, the work was well maintained and good progress made. The bronze medal and certificate of honour for the first course have been awarded to Mr. T. A. Henry and Mr. A. T. Hill respectively. Mr. Henry has also carried off the silver medal for the session, certificates of honour being obtained by Mr. Taylor and Mr. Lander.

During the past session, thirty-eight students attended the winter term of the course of the Theory and Practice of Pharmacy, and thirty during the summer. The two Laboratory courses of practical manipulation were followed by thirty-one and thirteen students respectively. The bronze medal was gained by Mr. Aubrey Thomas Hill. The silver medal was gained by Mr. Charles John Taylor.

One change in the regulations made by the Council for the award of the School prizes calls for notice in this report. The clause restricting the competition to those students who had not attended the courses of lectures and laboratory work in a previous year has been withdrawn. It is hoped that this change may encourage many students to attend lectures during their apprenticeship.

The Professors and Lecturers are again gratified to find that the School has more than held its own in the open competition for the medals and prizes offered by the Council of the Pharmaceutical Society.

The Pereira medal was won by Mr. A. T. Hill, and the Society's silver medal by Mr. C. E. Ashby (Bell Scholar).

While regarding the progress of the students with considerable satisfaction, two events have happened during the year which cast a shade of gloom over our proceedings to-day. One of them touches myself, perhaps, more closely than it does my colleagues, but in it we all recognise and feel a deep sense of loss. Our venerable friend and colleague, Emeritus Professor Bentley, has passed away from our midst, after only a few years rest, following a long period of faithful labour in the interests of the School, and indeed of pharmacy generally. Of the details of his successful career there is no need to speak, his memory lives with affection and respect in all our hearts. No professor of our staff ever gained more thoroughly than he the esteem and confidence of those who studied under him.

Mr. R. H. Davies, a former student in the School, and at one time one of the Demonstrators in the Chemical Laboratory, has also passed away. Mr. Davies was a member of the Board of Examiners, and Treasurer of the British Pharmaceutical Conference.

After the reading of the report, the President proceeded to distribute the prizes and certificates to such of the successful candidates as were present, offering in each case a few appropriate words of congratulation.

LIST OF PRIZEMEN IN THE SCHOOL OF PHARMACY COMPETITIONS.

THOMAS JACKSON.

Certificate of Honour—Session—Chemistry.

ARTHUR LANDER.

Certificate of Honour—Session—Practical Chemistry.

Certificate of Honour—Session—*Materia Medica*.

CHARLES EDMUND ASHBY.

Certificate of Honour—1st Course—Practical Chemistry.

Certificate of Honour—1st Course—Botany.

Silver Medal—Session—Practical Chemistry.

Certificate of Honour—Session—Chemistry.

Certificate of Honour—Session—Botany.

THOMAS ANDERSON HENRY.

Certificate of Honour—1st Course—Chemistry.

Bronze Medal—1st Course—*Materia Medica*.

Certificate of Honour—Session—Practical Chemistry.

Silver Medal—Session—Chemistry.

Certificate of Honour—Session—Botany.

Silver Medal—Session—*Materia Medica*.

CHARLES JOHN TAYLOR.

Bronze Medal—1st Course—Practical Chemistry.

Bronze Medal—1st Course—Chemistry.

Certificate of Honour—1st Course—Botany.

Certificate of Honour—Session—Practical Chemistry.

Certificate of Honour—Session—Botany.

Certificate of Honour—Session—*Materia Medica*.

Silver Medal—Session—Pharmacy.

AUBREY THOMAS HILL.

Certificate of Honour—1st Course—Practical Chemistry.

Certificate of Honour—1st Course—Chemistry.

Bronze Medal—1st Course—Botany.

Certificate of Honour—1st Course—*Materia Medica*.

Bronze Medal—1st Course—Pharmacy.

Certificate of Honour—Session—Chemistry.

Silver Medal—Session—Botany.

MR. HANBURY'S GIFTS OF BOOKS.

The following prizemen were presented with the books mentioned, which are given by Mr. Thomas Hanbury in memory of his brother, the late Daniel Hanbury, F.R.S.

TO CHARLES EDMUND ASHBY, 1st Prizeman in Practical Chemistry, copies of "*Pharmacographia*" and "*Science Papers*."

TO THOMAS ANDERSON HENRY, 1st Prizeman in Chemistry and in *Materia Medica*, copies of "*Pharmacographia*" and "*Science Papers*."

TO AUBREY THOMAS HILL, 1st Prizeman in Botany, copies of "*Pharmacographia*" and "*Science Papers*."

TO CHARLES JOHN TAYLOR, 1st Prizeman in Pharmacy, a copy of "*Science Papers*."

THE HERBARIUM PRIZE.

Professor GREEN then presented his report on the competition for the Herbarium prize. The

new regulations recently introduced had now made themselves felt, and he could trace their influence very clearly in the competition on which he had to report. Only two collections had been sent in, one of which, by Mr. John Wishart, of Insch, was very meritorious in many respects, but there were one or two shortcomings, and he could only recommend the award of a Bronze Medal, and the other one sent in by Mr. Charles Kent, of Brighton, obtained a Certificate of honour.

COUNCIL EXAMINATION PRIZES.

The PRESIDENT, in the name of Messrs. Dott and Jack, presented their report on the competition for these prizes. Fifteen candidates competed, and the papers of those who had gained the prizes were of a very high character, though some others were not quite so good as might have been expected. He then presented the medals and books to the successful competitors as follows:—

I. PEREIRA MEDAL (SILVER); and Books of the value of £5, presented by the late Thomas Hyde Hills.

AUBREY THOMAS HILL.

II. PHARMACEUTICAL SOCIETY'S MEDAL (SILVER); and Books of the value of £3, presented by the late Thomas Hyde Hills.

CHARLES EDMUND ASHBY.

III. PHARMACEUTICAL SOCIETY'S MEDAL (BRONZE); and Books of the value of £2, presented by the late Thomas Hyde Hills.

FREDERIC WILLIAM GAMBLE.

JACOB BELL MEMORIAL SCHOLARSHIP.

Mr. GERRARD, in presenting the report on this competition, said the number of entries was twenty-two, which was rather below the average for the past few years. The quality of the papers, however, was very high; twelve obtained sufficient marks to entitle them to the Scholarship, and the two who stood highest obtained respectively 356 and 345 marks out of a possible 400. These two gentlemen were—

Mr. Harold Brown,

and

Mr. John Robert Walker,

and the Scholarships had been awarded to them.

With regard to the Manchester Pharmaceutical Association Scholarship, he regretted to have to report that only one candidate came forward, and the examiners did not consider that the answers he gave to the papers were of sufficient merit to entitle him to the prize. This was much to be regretted, and considering the large district from which competitors might be drawn, he trusted that in future years there would be no lack of capable candidates.

THE REDWOOD SCHOLARSHIP.

The PRESIDENT, having explained the manner in which this Scholarship is awarded, viz., by the Council, on the report by the Research Committee, assisted by the Director of the Research Laboratory, announced that it had this year been conferred on Mr. Thomas Anderson Henry.

He then called on Mr. Walter Hills to deliver

THE INAUGURAL SESSIONAL ADDRESS,

which is printed at p. 271.

At the conclusion of the address,—

Sir RICHARD QUAIN, President of the Medical Council, and honorary member of the Society, said their President had imposed on him a pleasant duty—that of proposing a cordial vote of thanks to Mr. Hills for his admirable address, an expression in which he felt all present would readily join. His remarks had proved full of historical interest, and full of instruction and suggestion, and he doubted not they would be read and appreciated by many who were not actually present to-day to hear him. Mr. Hills was the representative of a house which had been a great support to the Pharmaceutical Society—the house of John Bell and Co., now approaching its centenary, one member of which, Mr. Jacob Bell, he (Sir Richard Quain) had the pleasure and privilege of calling a friend, and he was also a liberal supporter, if he could not describe him as the originator, of this Society. Reference had also been made by Mr. Hills in a merely passing and too modest a way to another valued friend, Mr. Thos. Hyde Hills, a name which would ever be remembered in connection with this Society, and also in general society, as one of the most generous of men. He had heard that it was said in the presence of Thackeray that Mr. Hills was the prototype of the Cherrybles Brothers, upon which some one remarked that that was impossible, as there were two of them. Oh! yes, was the answer to that remark, it was quite possible, for it would take the two Cherrybles rolled into one to make a Hills. However that might be, Mr. Hills' references to-day took him back in thought to the early days of his own studentship—to Anthony Todd Thomson, his friend and teacher, to Pereira and others, on whose names and memories it was so pleasant to reflect as benefactors not only to this Society but to the world at large. Mr. Hills had referred to prescribing chemists and dispensing doctors. For himself he had no objection to prescribing chemists who gave a simple remedy for a simple application; but he did object to those who visited the sick and were guilty of crimes next to murder by doing that of which they had no real knowledge, and for which they were not qualified. He could only say that a qualified practitioner who opened a shop and rivalled the chemist in trade was as much to blame as the prescribing chemist; but he believed that the good education both classes were now receiving would render such lines of practice more limited than they had been, and it would be for the benefit of everyone that it should be so. Mr. Hills had also alluded to quack medicines and ready-made physic. Why should physicians deal in such articles when they had accomplished and educated chemists ready to give their assistance in preparing all that was necessary? When he heard of this ready-made physic he always thought of ready-made clothes; such things did not fit, and were not generally of very good quality. He trusted that feeling would continue, and that they would continue to support that high education of the pharmacist which was for the benefit of the public. Mr. Hills had told them of means taken by the Society to secure that, and he was sure it would continue to do so. He could not conclude without saying a word on what pharmacists had done for the medical profession. His late friend, Professor Redwood, gave the Medical Council invaluable assistance in the formation of the phar-

macopœia, and his work was now continued by Professor Attfield.

Sir ALFRED BARING GARROD, in seconding the motion, said he felt it impossible to be absent that afternoon when he saw that Mr. Hills was to deliver this address, and he had been amply rewarded for coming. Although he had lately had comparatively little to do with the Pharmaceutical Society, he had a great deal to do with its earliest history, for he remembered in 1842 attending a meeting at Mr. Jacob Bell's, at which William Allen, the Hanburys, and a great many others were present, and he believed that was one of the earliest meetings of the Society. The Society had done an immense amount of good to this country and to the medical profession. He cordially agreed with what Sir Richard Quain had said with regard to prescribing chemists and dispensing medical men—they were both errors. A medical man should confine himself to prescribing and allow the chemist to dispense. With regard to quack medicines, he might say for himself that, following the principles of the Royal College of Physicians, he never in his life, that he could remember, prescribed a drug which was not contained in the pharmacopœia, or of which the composition was not thoroughly known. As for prescribing a ready-made pill, it was an absurd thing for a medical man to follow the directions of some one of whom he knew nothing. There were no doubt certain drugs which were made up in large quantities, but that ought not to be the business of a medical man. He had the greatest pleasure in seconding the proposition.

The resolution was then put and carried unanimously.

Mr. HILLS, in responding, said it was very gratifying to him to hear Sir Richard Quain speak as he had done of his early relations with Jacob Bell and with his late uncle, and he thanked him especially for coming there and giving expression to views which he was sure would meet with the approval of a number of pharmacists who were not present on that occasion. Both he and Sir Alfred Garrod occupied a position in the medical world which would cause their words to be received with the highest respect, and he thanked them cordially for their presence.

The visitors then proceeded to inspect the School premises and partake of refreshments.

EXAMINATIONS IN LONDON.

October, 1894.

MAJOR EXAMINATION—PASS LIST.

Candidates examined.....	26
„ failed	15
„ passed	11

Burrows, Harry.
Davies, Herbert Paget.
Davies, John.
Ford, James.
Gillett, Francis John.
Grieve, James.
Hughes, Joshua Arthur.
Humphrey, John Thurlbeck.
King, Charles Edward.
Parry, Owen.
Thorpe, Albert.

MAJOR EXAMINATION QUESTIONS.

BOTANY.

September 28.—Hours from 10 a.m. to 1 p.m.

1. Report upon the section submitted to you for microscopical examination.

N.B.—Not more than 15 minutes can be allowed to each candidate for the use of the microscope.

2. Distinguish between the Natural Orders Rosaceæ and Ranunculaceæ. Name the more important indigenous genera of the Rosaceæ.

3. Describe the occurrence of latex in plants. Name any natural orders in which it is found. Mention any medicinal or economic products derived from it.

4. Describe the method of reproduction in mosses.

5. What do you understand by a spurious fruit? Give examples and describe their formation.

6. State what you know respecting the occurrence of silica in plants.

MATERIA MEDICA.

September 28.—Hours from 2 to 5 p.m.

1. What are the botanical and geographical sources of Asafoetida? State what you know respecting its collection, and describe its constituents.

2. In what plants does Caffeine occur? Give a method for its extraction, and describe tests for its identification.

3. What is Indigo? From what plant is it derived, and how may it be prepared.

4. How is essential Oil of Lemon prepared? Name and describe its chief constituents.

5. Discuss fully the official method for the estimation of Morphia in Opium, giving reasons for each step of the process.

6. Give the botanical sources and describe the physical and chemical characters of the following:—Berberine, Homatropine, Picrotoxin, Thymol, Cathartic Acid.

CHEMISTRY.

September 29.—Hours from 10 a.m. to 1 p.m.

1. Write an account of the Periodic Law.

2. Discuss the analogy of nitrogen, phosphorus and arsenic.

3. Describe Raoult's method of determining molecular weights. What special value does this method possess?

4. Show by equations what occurs when aldehyde is treated with—

- (a) Reducing agents.
- (b) Oxidising agents.
- (c) Ammonia.
- (d) Hydrocyanic acid.
- (e) Sodium hydrogen sulphite.

5. State what you know about the isomeric forms of tartaric acid.

6. What are mercaptans? How are they produced, and what do they yield by oxidation?

PHYSICS.

September 29.—Hours from 2 to 5 p.m.

1. What is meant by the "critical point" of a gas? Describe some methods of liquefying gases.

2. Draw diagrams to illustrate the structure of the spectroscope. What are ultra-violet and ultra-red rays, and how may their presence be recognised?

3. How would you determine the specific heat of lead?

4. Describe the construction of the balance, and show clearly how (a) accuracy and (b) delicacy are attained.

5. What is Ohm's law? What is the strength of the current passing through a wire having a resistance of 45 ohms, connected with a battery of six cells arranged in series, the E. M. F. of each cell being 1.8 volts, and its internal resistance .7 ohm?

6. An electric current is passed successively through acidulated water, solution of cupric sulphate and argentic nitrate. When 15 C.c. of mixed gases have been evolved from the water, what weights of copper and silver will have been deposited?

Cu = 63.4; Ag = 108.

Provincial Transactions.

MEETING AT NEWCASTLE-ON-TYNE.

In response to an invitation from Mr. Barnard S. Proctor, Local Secretary of the Pharmaceutical Society for Newcastle-on-Tyne, a meeting of the chemists and druggists of the city and neighbourhood was held on Wednesday, September 26.

Messrs. B. S. Proctor, N. H. Martin, T. Milner, J. J. Daker, T. Maltby Oslague, J. Rose, G. Hall, W. Giles, G. Weddell, G. N. Merson, T. S. Herd, and P. Bell Kirkup were present. A letter regretting inability to attend was read from Mr. Wardroper, of Cullercoats. Mr. Proctor was elected chairman.

The first object of the meeting was to agree upon a gentleman to act as Local Secretary of the Pharmaceutical Society, Mr. Proctor having intimated that he would prefer to make way for a younger man. It was explained that the nomination would be made by the members and associates in business of the Pharmaceutical Society in the usual way, but that the suggestion of a preliminary discussion and agreement was made some time ago.

A conversation then took place on the subject. Subsequently the effect of the decrease in the revenue from stamped medicines was discussed on a set of figures brought forward by Mr. Weddell. Mr. Martin and the Chairman afterwards gave the meeting some interesting information as to the effect of recent decisions in the law courts as to the sale of poisons.

American Pharmaceutical Association.

ANALYTICAL ALKALOIDAL CHEMISTRY.*

The Relative Value of Gravimetric Methods, Mayor's Reagent and Titration with Volumetric Acid Solutions in Assaying Alkaloidal Drugs and Galenical Preparations.

BY LYMAN F. KEBLER, PH.C., B.S.

A century has nearly elapsed since the discovery of the first alkaloid, "morphium," by Sertürner, and yet how inefficient and unsatisfactory are the methods generally employed in our era for estimating these active principles.

The earliest methods devised for the detection and estimation of alkaloidal poisons in forensic chemistry were those found effective in removing the alkaloids from the inert matter associated with them in nature. The material was first extracted with dilute acids, aided by gentle heat, the gummy matter and other substances removed with lead acetate, excess of lead precipitated with hydrogen sulphide, and the alkaloid obtained as an impure alkaloidal salt, generally an acetate.

* Read at the forty-second annual meeting, 1884.

† Dict. Applied Chem. (Thorpe), vol. 3, page 900; Handwörterbuch der Chemie (Ladenburg), Vol. I., page 214.

Nearly all of the methods now employed are based on the principles of immiscible solvents introduced by F. J. Otto,* in 1856, as a modification of J. S. Stas† method for the recovery of alkaloidal poisons. Ether was first so employed, then followed chloroform,‡ amylic alcohol, and finally G. Dragendorff§ presented a comprehensive scheme for separation by solvents immiscible with water applied in both acid and alkaline solutions. The plan of separation first published in pharmaceutical journals, primarily for the use of toxicologists, has been extended by chemists everywhere and in every direction, so that it has become the most convenient method of separating alkaloids for analytical work and manufacturing purposes.

Ingenious and comprehensive as are some of the recognised methods based on the above principles of immiscibility, nevertheless the results are frequently wide from the truth as generally arrived at gravimetrically. Not that the gravimetric part of the assay is deficient, for that portion of the process is recognised as the most reliable of all methods, but the extraction of inert matter through the agency of immiscible solvents prior to the weighing is the detrimental part. Extract the acid solution as long as you please with a given immiscible solvent, yet on rendering the solution alkaline there appears to be a certain amount of the material rendered soluble in the solvent employed. In some cases the quantity is inappreciably small, in others it composes the greater part of the alkaloidal extract. How to eliminate these foreign, not always inert substances, is a question frequently harassing us. As types of the gravimetric processes containing this objectionable feature may be mentioned the methods of Lösch, Hager, Lyons, Lloyd, Thompson, Beckurts, Dietrich, etc.

It is not necessary to go into the merits and demerits of the methods, suffice it to say that each is favoured with both more or less. Even the officially recognised method for assaying opium and opium preparations comes to share the spoils in this direction, for as high as 2 per cent. of foreign matter has been found in some of the samples of morphine obtained by this process.

To be sure there are special methods for separating alkaloids in a state of purity, as that introduced by Scheibler,¶ based principally on phosphotungstic acid and chloroform; another initiated by T. B. Groves,** using potassium mercuric iodide and an immiscible solvent; also a third method based on Sonnenschein's†† reagent, sodium phosphomolybdate, and an appropriate solvent. By employing these latter processes, we are enabled to secure a product of considerable purity, at no inconsiderable loss however. Nor is this all, but these

* 1856, F. J. Otto, Ann. (Liebig), 100, 89.

† 1852, J. S. Stas, Bull. de l'Académie de médecine de Belgique, 9, 301; Ann. (Liebig), 84, 379; Jahresber. der Chemie, page 640.

‡ 1857, J. E. D. Rodgers and G. P. Girwood, Pharm. J. Trans., 16, 497.

§ 1861, L. Uslar and J. Erdmann, Ann. (Liebig), 120, 121.

|| 1867, G. Dragendorff, Pharm. Ztschr. f. Russ., 6, 663; Russ. Arch. f. gericht. Med. J., 1; Ztschr. anal. Chem., 7, 521.

1876, Die gericht. chem. Ermittl. v. Giften, page 141.

TRANSLATIONS: A. B. Prescott, 1875; Outlines of Proximate Organic Analysis, page 136; S. D. Hayes, 1876; Am. Chem., 6, 378.

H. G. Greenish, 1884; Plant Analysis, Eng. Ed., page 45.

¶ 1872, Tageblatt, der Versammlung deutscher Naturforscher und Aerzte zu Leipzig, page 115; 1873, Ztschr. anal. Chem., 12, 315.

** 1864, Pharm. J. Trans. (2), 6, 268.

†† 1857, Ann. (Liebig), 104, 45.

Substance.	Gravimetric.			Mayer's Reagent.			Volumetric Acid.			Deci-normal Factor.
	Maxi-mum.	Mini-mum.	Mean.	Maxi-mum.	Mini-mum.	Mean.	Maxi-mum.	Mini-mum.	Mean.	
Aconite Root.....	1.140*	1.060	1.100	1.320	1.261	1.210	1.013	0.937	0.975	0.0647
Fl. Ext. Aconite Leaves.....	0.431	0.301	0.366	0.428	0.315	0.371	0.297	0.193	0.242	0.0647
Fl. Ext. Aconite Root.....	0.826	0.700	0.763	0.975	0.923	0.949	0.645	0.605	0.625	0.0647
Fl. Ext. Belladonna Leaves (a).....	0.493	0.401	0.447	0.781	0.763	0.772	0.223	0.214	0.228	0.0289
Fl. Ext. Belladonna Leaves (b).....	0.356	0.325	0.341	0.349	0.325	0.337	0.315	0.303	0.309	0.0289
Fl. Ext. Belladonna Root.....	0.350	0.350	0.350	0.376	0.357	0.366	0.331	0.317	0.324	0.0289
Fl. Ext. Blood Root.....	1.710	1.531	1.620	1.135	1.091	1.113	Too much colouring matter.			
Fl. Ext. Cinchona Red.....	5.134	3.562	4.343	Unreliable.			4.521	3.833	3.142	0.0314
Fl. Ext. Cinchona Comp.	1.844	1.524	1.684	Unreliable.			1.315	1.113	1.464	0.0314
Fl. Ext. Coca Leaves.....	0.627	0.456	0.541	Unreliable.			0.621	0.440	0.531	0.0308
Fl. Ext. Colchicum Root.....	0.397	0.352	0.374	0.647	0.561	0.604	Unsat isfactory.			0.0399
Fl. Ext. Colchicum Seed.....	0.707	0.453	0.580	0.971	0.646	0.808	Unsat isfactory.			0.0399
Fl. Ext. Conium Fruit.....	0.776	0.631	0.653	Unreliable.			0.680	0.521	0.600	0.0127
Fl. Ext. Gelsemium.....	0.397	0.314	0.355	0.497	0.450	0.478	0.367	0.301	0.334	0.0406
Fl. Ext. Guarana.....	3.809	3.746	3.777	Does not precipitate.			Impracticable.			
Fl. Ext. Henbane.....	0.179	0.114	0.146	0.308	0.212	0.260	0.152	0.112	0.132	0.0289
Fl. Ext. Hydrastis, Berberine.....	2.839	2.756	2.847	Unsat isfactory.			2.536	2.431	2.483	0.0335
Fl. Ext. Hydrastis, Hydrastine.....	2.000	1.931	1.965	Unsat isfactory.			1.634	1.457	1.545	0.0397
Ipecac Root.....	2.800	2.000	2.400	2.693	2.000	2.346	2.481	1.983	2.207	0.0254
Fl. Ext. Ipecac Root.....	2.371	2.163	2.212	2.265	2.192	2.223	2.133	2.002	2.062	0.0254
Fl. Ext. Jaborandi.....	0.621	0.533	0.577	Unsat isfactory.			0.540	0.413	0.476	0.0206
Nux Vomica Bean.....	1.813	1.752	1.787	1.911	1.832	1.871	1.732	1.698	1.715	0.0364
Fl. Ext. Nux Vomica.....	1.698	1.631	1.664	1.496	1.401	1.448	1.521	1.501	1.511	0.0364
Solid Ext. Nux Vomica.....	15.421	15.129	15.275	15.020	14.890	14.955	15.231	14.963	15.097	0.0364
Powd. Ext. Nux Vomica.....	18.435	18.209	18.322	18.013	17.973	17.993	18.103	17.941	18.022	0.0364
Fl. Ext. Stramonium Seed.....	0.473	0.397	0.435	0.375	0.366	0.365	0.385	0.312	0.348	0.0289
Fl. Ext. Stramonium Leaves.....	0.376	0.334	0.355	0.525	0.500	0.512	0.317	0.289	0.303	0.0289
Fl. Ext. Veratrum Viride.....	1.045	0.400	0.722	1.361	1.134	1.247	1.030	0.137	0.588	0.0687

* These numbers represent percentage.

methods can be neither expeditiously executed nor economically employed in an analytical laboratory where many analyses are made daily.

The germ of a very important method was introduced by P. Bouilly,* later announced by P. A. von Bonsdorff† and F. L. Winckler‡ in the alkaloidal reagent potassium mercuric iodide. A. von Planta-Reichenau§ reported the use of the tenth-normal solution of this reagent, substantially as presented in its practical form by F. F. Meyer.||

Most alkaloids are completely precipitated from aqueous acid solutions by a solution of potassium mercuric iodide. It has generally been assumed that these iodomercurates consist of a double iodide of the base with mercury, but there is a great discrepancy between fact and theory when attempting to verify this general assumption. The precipitates are far from being constant, varying with the degree of concentration, temperature, manner of adding the reagent, and many other minor points. Titrations executed under the same conditions precisely, often vary appreciably from one another, although they give close approximations to the truth in some instances.

A point deserving especial mention in this connection is what may be termed equilibrium; that is, a

condition in titration of such a nature that, on addition of either the reagent or the alkaloidal solution, a further precipitation occurs.

In spite of the imperfections clustering around this method, it certainly extends to us a tempting short cut to arrive at comparative values of the various alkaloidal plants, and contains in it a step (titration) which introduces us to a truly scientific method; titration with volumetric acid solutions; which consigns Mayer's reagent to the past as of quantitative value.

The employment of volumetric solutions in estimating the potency of alkaloidal plants is current with alkaloidal chemists abroad, and heartily sanctioned by many of our fellow-countrymen; nay, some have even expressed themselves publicly as to its being the only scientific and reliable method. It is to the latter that the writer would bring a word of encouragement. For some time the author has been collecting data bearing on this point, which are expressed in the table above.

That this method is confronted by no obstacles no one claims; in fact, we frankly admit that several questionable elements enter it *prima facie*, and give reasons of doubt as to its absolute correctness. Taking these defects and calculating them at the utmost, we find ourselves nearer the truth than by the results obtained by the general gravimetric methods.

The first defect deserving of mention is our imperfect

* 1837, Ann. der Phys. Pogg., 37, 99; Ann. Chim. Phys. (3), 34, 845.

† 1829, Ann. der Phys. Pogg., 33, 243.

‡ 1830, Buchner's Repertorium, 35, 57.

§ 1846, "Das Verhalten der Alkaloide gegen Reagentien," a dissertation at Heidelberg.

|| 1863, Am. J. Pharm., 35, 20; Chem. News, 7, 159; Chem. News, 8, 177 and 189.

NOTE.—For additional literature collected by the author and reported by A. B. Prescott, see Am. Chem. J., 14, 606.

NOTE.—In answer to the query, With what drugs does the ferric hydrate process give uniform results? I would say that all of the drugs in the above table gave me satisfactory results as a gravimetric process, excepting aconite leaves and sometimes the root, belladonna leaves, coca leaves, conium fruit, henbane, jaborandi, and veratrum viride.

knowledge of the molecular weights of several of the alkaloids, as emetine, aconitine, gelsemine, etc. This deficiency can be obviated only by diligent research, which will furnish us with the needed formulae. The second defect lies in this, that some of the drugs contain two or more alkaloids of different molecular weights, as nux vomica, cinchona, aconite, etc. This compels us to assume that the alkaloids exist in a certain relative proportion in order to arrive at a molecular weight on which to base our calculations, and can be remedied only by determining by careful analyses the definite amount of each alkaloid.

When we reflect a moment on the advancement the volumetric method represents, all with one accord must say that the amount of alkaloid represented by each titration is absolutely correct. A point in this connection should, however, engage our serious attention, and that is the method employed for extracting the alkaloid. One method is better suited for one drug than another, consequently we should endeavour to so execute our work that each drug be thoroughly tested by a number of workers with every economical process, and that process giving the most uniform results, as well as the highest, should be the one adopted by all alkaloidal chemists. Mr. Karl Schwickerath* has set us a most excellent example in his study of the "perforation method."† The result will be that a preparation standardised in California will have the same therapeutical strength as a similar article assayed in Maine. As it is at present, almost every analyst uses a different process for standardising and assaying a given drug, and the results are as variable as are the number of manipulators.

A single example sets forth the variability of the different methods with sufficient momentum to cause every diligent worker to reflect seriously. Fluid extract of belladonna leaves, with the gravimetric processes the variability ranged from 0.493 per cent. to 0.401 per cent.; with the potassium mercuric iodide reagent from 0.781 per cent. to 0.763 per cent., and the volumetric method gave us from 0.223 per cent. to 0.214 per cent. The material was taken from the same bottle and all assays made within forty-eight hours of one another, with at least duplicates in every case.

In the table (p. 286) are given the maximum, minimum, and mean results of the majority of the practical gravimetric processes, Mayer's reagent, and volumetric acid solutions.

The methods of procedure generally employed were those outlined in Allen's 'Com. Organic Anal.,' Prescott's 'Organic Anal.,' Lyon's 'Pharmaceutical Assay,' Dragendorff's 'Die Chemische Werthbestimmung starkwirkender Drogen,' and later methods in literature not collected and placed in text-books.

A short perusal of the results portrayed in the above table clearly reveals the desirability of a more uniform system of assaying the various alkaloidal plants and their preparations.

In titrating with volumetric acid solutions the indicator is one of the first factors to be called into requisition. The behaviour of the alkaloids with indicators presents some remarkable differences. Methyl orange can be used generally in titrating the alkaloids with mineral acids. Litmus and phenolphthalein‡ are applicable to the strongly basic alkaloids, but are worthless for the feeblers ones. Lacmoid has been employed by Van Itallie§ for titrating certain

alkaloids with hydrochloric acid, and E. Dieterich* used rosolic acid, but his results leave the value of the indicator in doubt. C. C. Keller† in his extensive communications on the valuation of drugs employs hæmatoxylin as the indicator and hydrochloric acid for titrating. Brazil wood has recently been reported as very efficient,‡ and adopted by the United States Pharmacopœia of 1890 for titrating nux vomica and its preparations, but cochineal has proven most efficacious in the writer's hands for all alkaloids.

In titrating with cochineal or methyl-orange it is seldom convenient to employ an aqueous solution of the alkaloid. A solution of the base in dilute alcohol is quite suitable, the indicators being very sensitive in this menstruum.

Occasionally the alkaloidal residue is abundantly contaminated with colouring matter, extracted with the alkaloid from its natural sources. In such cases the following ingenious method, due to A. H. Allen,§ is very useful. Dissolve the residue in a small quantity of ether, transfer the solution to a small glass-stoppered cylinder, add a few cubic centimetres of water coloured with the indicator. The standard acid solution is gradually added in drops and the solution well agitated after each addition. Under these conditions the end re-action is easily determined, for the colouring matter in the upper ethereal layer presents a strong contrast to the lower coloured aqueous stratum.

The principles of volumetric analysis are so well known that it seems quite unnecessary to give the method of procedure in detail.

The acid solutions found to give the most uniform and satisfactory results were twentieth-normal solutions of sulphuric and hydrochloric acids. The acid is added in slight excess, and titrated back with a centinormal solution of potassium hydroxide.

In conclusion, the writer would urgently recommend the adoption of a certain method for extracting the base or bases from each alkaloidal plant, and titrating the residue with a volumetric acid solution in order to obtain uniform results with every drug.

Society of German Naturalists and Physicians.

The sixty-sixth meeting of the Society of German Naturalists and Physicians, formally opened on Monday, Sept. 24, at Vienna, must be regarded as one of the largest and most interesting of recent congresses. Probably over three thousand persons, ladies and gentlemen, took part in it, amongst them many of the leading lights of each of the forty sections into which the congress was divided.

No city in the world could offer such attractions for a visit of this nature as Vienna. Centrally situated, easy of access, replete with buildings of exquisite beauty, and possessing a university of world-wide reputation, it has no rival, as indeed the success of the congress proved.

On the occasion of the opening by Professor Kerner von Marilaun, the large hall of the Musikverein, in which the general meetings were held, presented a brilliant sight. The body of the hall was filled with members and visitors, the bright blue uniforms of numerous officers relieving the sombre black of the civilians, whilst the surrounding open

* 1893, *Bull. Pharm.*, 7, 534, and 1894, *Ibid.*, 8, 246.

† 1893, Van Ledden Hulsebosch, *Pharm. Centralhalle*, 34, 101.

‡ 1897, P. C. Plugge, *Arch. der Pharm.* (3), 25, 45 and 49.

§ 1879, *Nederl. Tydsch. v. Pharm.*, Jan.; *Analyst*, 14, 118.

* 1887, *Pharmaceut. Centralhalle*, 28, 21; *Am. J. Pharm.*, 59, 179; *Pharm. J. Trans.* (3), 17, 888.

† 1894, *Wochenschr. f. Chem. u. Pharm.*, 32, Nos. 5, 6, 7, 12, and 13.

‡ 1893, C. Caspari and A. R. L. Dohme, *Am. J. Pharm.*, 65, 478; *Proc. Am. Pharm. Assoc.*, 41, 118.

§ *Com. Organic Anal.*, Vol. 3, pt. 2, p. 181.

boxes were assigned to the ladies. Unfortunately, the size of the hall, and possibly also defective acoustic properties, rendered the speakers inaudible to the majority of those present. After the conclusion of the opening ceremony and the delivery of addresses by Professor Leyden (Berlin) and Professor E. Mach (Prague), sectional meetings of the diverse forty sections into which the Congress was divided were held in the lecture theatres of the University or other institutions.

Of these forty sections, the two of most interest to pharmacists were No. 20 (Pharmacology and Pharmacognosy) and No. 21 (Pharmacy). Seldom has pharmacy been more worthily represented. To prove this it is but necessary to mention such names as Beckurts, Fröhlich, Hanausek, Hartwich, Hellman, Martenson, Moeller, Schär, Schmidt, Waldheim, Tschirch, and Vogl. In the former of the two sections Professor Vogl was elected chairman, and proceedings at once commenced by a paper by Dr. Gottlieb on the physiological action of the various tropines, lactyl tropine alone possessing to the author the characteristic action of atropine.

Professor Vogl next discussed the structure of genuine and false cubebs, and drew attention to the admixture, apparently accidental, of the root of *Cypripedium pubescens* with hydrastis and with serpentary. The remaining papers announced in this section being of purely pharmacognostical interest the section amalgamated with No. 21 (Pharmacy).

In this department Professor E. Schmidt (Marburg) had been elected chairman. Professor Schär, in a paper on tincture of guaiacum, considered it a valuable reagent if properly used. Professor Beckurts (Brunswick), recognising the importance of the subject, discussed the methods of assay of nuxvomica, belladonna, henbane, stramonium, conium, ipecacuanha, and their preparations; the proceedings in this section terminated with a paper by Alois Kremel (Vienna) on beeswax, in which the author insisted on the inefficiency of Hübl's acid and ester numbers alone, and the necessity of applying other tests, such as specific gravity, etc.

Most of the members of the section and many others were present the same evening in the hall of the Lower Austrian Gewerbe Verein, in which Professor Tschirch showed and explained a series of about a hundred lantern slides illustrating his travels in Ceylon and Java. The magnificent sciopicon lent by the Verein attracted much attention.

The second meeting of the section Pharmacy was held in the museum of the Apotheker Verein, and combined with a meeting of that society and the Hauptgremium. To the uninitiated the object of this arrangement was soon demonstrated by an eloquent speech delivered by Professor Tschirch (Bern), emphasising the services which had been rendered to pharmacognosy by Professor Vogl (Vienna), and tendering him, in the name of the committee he represented, the Flückiger medal. After the uproarious applause which followed the presentation had subsided, Professor Vogl responded.

Professor E. Schmidt (Marburg) then discussed the relations existing between atropine, hyoscyamine, and scopolamine, maintaining the non-existence in henbane seed of an alkaloid of the formula $C_{17}H_{23}NO_3$. Professor Schmidt also demonstrated the relation in which corydaline stood to berberine.

Professor Tschirch (Bern) followed with a paper on "Secretions," summarising the results obtained in his laboratory in investigations on the chemical constitution of these bodies, and asserting that the formation took place in a particular layer of the cell wall, and in that layer alone. Professor Tschirch also explained the course of germination of the nutmeg.

Storax was considered by Professor Moeller (Graz)

to be a pathological product, as it was not contained pre-formed in the bark, nor could it be obtained by incision. Gentle beating was followed by formation of the balsam.

Professor Hartwich (Zürich) showed two so-called "false" cinchona barks, the one he referred to *Ladenbergia magnifolia*, the other being probably the bark of a sapotaceous tree.

These proceedings concluded the morning sitting; in the afternoon the Viennese pharmacists gave a practical demonstration of their hospitable sentiments in the form of a dinner, at which the President of the Apotheker Verein, Herr v. Waldheim, presided.

On Wednesday a second general meeting was held, during which lectures were delivered by Professor Klein (Göttingen), Professor Forel (Zürich), and Professor Boltzmann. In the afternoon the section Pharmacy again experienced Viennese hospitality in the form of a dinner given by the Austrian Pharmaceutical Society under the auspices of its President, Dr. Hellmann (Vienna). As on the previous day, the enthusiastic reception of the toasts and responsive speeches could not leave in the most sceptical mind a trace of doubt as to the sincerity of the reception accorded to the visitors. Thursday was devoted entirely to business. Professor Schär (Zürich) described the structure of the bark of *Fouquiera splendens*, and showed the seat of the wax, ocotilla wax, which it yields. Dr. Schacherl (Vienna) adduced figures in support of Flückiger's opium assay process, in which, however, he found a vigorous opponent in Eugen Dieterich (Helfenberg). The latter had analysed a large number of samples of opium from the museum of the Pharmacological Institute (Vienna), and communicated the results. Dr. Jolles (Vienna) discussed the detection of sugar in urine, whilst Dr. Schrank (Vienna) spoke of the probable influence of bacteriology on pharmacy. Anton v. Waldheim (Vienna) pointed out the progress towards internationality shown by the latest editions of various pharmacopœias. Dr. Kwizda compared at length the tests adopted by the German, Austrian, Swiss, and other pharmacopœias for certain bodies. After the last paper had been read the meeting was declared closed.

Beyond these meetings and functions, which were exclusively pharmaceutical, the members availed themselves of the invitations issued to the members in general. Of special interest were the receptions at Court by the Archduke Carl Ludwig, and at the Rathaus by the burgomaster, Dr. Raimund Gröbl. If the honour of the former be greater, yet the geniality of Dr. Gröbl's reception charmed all visitors. The ladies on this occasion were presented with bouquets, the gentlemen with cigar cases containing cigars and cigarettes. Nor was the inner man forgotten. If it were possible to have been fatigued by the inspection of that beautiful building, provision was made for the possibility by refreshments of most varied nature.

The last general function was the excursion to Semmering on Saturday, September 29. About 400 of the visitors were conveyed by special train to Semmering, where the day was spent in excursions under the guidance of members of the local Alpine club. The exquisite scenery and the interest attached to the mountain railway rendered the excursion a most enjoyable one.

During the whole of the Congress most of the public buildings, institutions, museums, and the like were open to inspection by the visitors. The facilities thus offered to strangers contributed largely to the success of the meeting, and to the pleasure of those fortunate enough to take part in the Congress. For its meeting-place next year the Society has decided upon Lübeck.

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

PECULIAR DISPENSING BY A MEDICAL MAN

An inquest was held at Hatcham on September 28, respecting the death of the infant daughter of a machine minder named Button. The child being ill from bronchitis the mother took it to Dr. Scott's surgery and got a bottle of medicine. When she arrived home she gave the child a dose, and shortly afterwards the doctor called and said he had made a mistake in the mixture. The child was attended by the doctor during the day, but she died. At Coroner Wyatt's inquiry the father said he believed Dr. Scott did all he possibly could for deceased. Dr. Scott said he attended the baby for bronchitis a short time back. When the mother called on Tuesday he was mixing a lotion consisting of acetate of morphine in a large graduated glass which he usually kept for water. Witness put the glass on the counter, and, taking a bottle, placed therein the necessary drugs. Having done so, he mechanically took up the glass containing the poison and filled up the bottle. Almost immediately the woman had left he discovered the mistake. As he had not the name of the parents on his book he went to Mr. Hobman, the proprietor of the estate, and from him ascertained the address. Upon arriving at the house he was informed by the mother that she had given deceased a dose. The usual remedies were resorted to, but deceased gradually became comatose and died. He was a fully qualified medical practitioner. The bottle was a 1½ oz. one, and the lotion he put in in mistake for water contained about a third of a grain of pure morphine. He saw deceased about twenty minutes after it had taken the dose, and did all he possibly could to save its life.

The Coroner: It's a very sad case, but in my opinion there was no carelessness. Dr. Scott has not attempted to shield himself in any way, and he has given his evidence very straightforwardly.

The jury eventually returned a verdict of "Death from misadventure."—*Morning Leader*.

POISONING BY WEED-KILLER.

At Bathgate, September 23, Robert Gibson, seven years of age, residing with his parents at Academy Street, Armadale, died under peculiarly painful circumstances. The boy's father had recently been on a cycling tour to Berwickshire, and, his machine having required oil, he obtained a poisonous weed-killer from his brother-in-law in mistake for machine oil. Some time afterwards the brother-in-law discovered his mistake, and warned Mr. Gibson to destroy it at once. It seems that the father forgot to do so, and on Friday the boy had some liquorice, and while looking for a bottle to make some liquorice juice, he came across the one containing the poison. Thinking it was liquorice juice he drank some of it, and not till twenty minutes afterwards told his mother, who immediately sent for Dr. Anderson, who applied the usual emetics without avail.—*Glasgow Evening Times*.

POISONING BY A PLATINUM SALT.

On Friday, September 21, Mr. L. R. Rowbottom, Coroner, held an inquest at the Infirmary, Wigan, into the death of a child named John Valey, who died on Wednesday from the effects of taking a quantity of

platinum, which was administered in mistake for teething powder.

The Coroner explained that Inspector Williamson being away he had made enquiries into the case himself. The mother of the child went to Mr. Atherton's shop in Market Street to obtain some teething powder for her son, who was seven months old, and some insect powder. It seemed that almost at the same time a customer had purchased a preparation of platinum for photographic purposes. He bought eight grains, for which he paid a shilling, the value of the preparation being about £10 per ounce. It was made up in a parcel exactly similar to those which contained the teething powder and the insect powder. In putting the powders into her pocket the woman picked up the platinum that had been purchased by the man. The latter came back to the shop and said "I have lost my parcel." He bought another shillingworth, obtaining the last eight grains they had in the shop. When the woman got home she gave what she thought was the teething powder to her child, and after it was taken ill she found that she had given the child that which she did not know she had, and which she never intended to purchase. The question came as to the sale of drugs and poisons. The platinum was not scheduled as a poison under the Pharmacy Act, and the chemist, who did not sell it to the mother, did not know it was poison.

Dr. R. S. Hardman, junior house surgeon at the Infirmary, said the deceased was admitted to that institution about ten o'clock on Tuesday night. He was then in a state of collapse, and was suffering from symptoms of intestinal irritation. He immediately suspected poison, but did not know what kind. He inquired from the parents, and was told that a wrong powder had been given in mistake. Death took place a few hours after admission. He had since made a post-mortem examination. Externally the child was fairly well nourished. Internally all the organs were healthy, except that there were enlarged glands in the abdomen and evidence of intestinal disease. There were traces of mineral poisoning, and in witness's opinion death was due to that. Platinum was almost unknown as a drug. It had not been experimented with, but witness had been informed by a Fellow of the Chemical Society that the amount given to the deceased would be sufficient to cause death.

A verdict of "Accidental death" was returned.—*Wigan Examiner*.

POISONING BY HEMLOCK.

At Greenock, on September 30, two children, named William and James Harkness, aged eight and six years respectively, were accidentally poisoned by eating hemlock. It appears that the boys were removed in an unconscious state to the Infirmary, where they were at once attended by the house surgeon, who stated that they were in a dangerous condition. Later, however, both children were declared to be out of danger.—*Greenock Telegraph*.

FATAL DOSE OF SYRUP OF HYPOPHOSPHITES.

On Tuesday, September 18, at Burslem, George Pattison was found dead, showing symptoms of strychnine poisoning. A bottle of compound syrup of hypophosphites, which was produced, had been given to deceased by a fellow-lodger, who said he had warned deceased that the bottle contained enough poison to cause death. The following morning the bottle which had contained the syrup was found empty after the deceased had left home. The jury found that death was caused by an overdose of the syrup, taken whilst of unsound mind.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

WHAT IS SODA WATER?

Rudolph Gaunt, wholesale chemist and druggist,* of 221, Union Street, Borough, appeared before Mr. Slade to answer a summons, taken out at the instance of Inspector Grist, the appointed officer to the St. Saviour's District Board of Works, under the provisions of the Sale of Food and Drugs Act, for selling an article, the same not being of the nature, substance, or quality of that demanded. The inspector sent his assistant into the defendant's shop, and under his instructions he purchased a syphon of soda water. The bottle containing the liquid was handed to him, and was analysed, and was found to be practically aerated water, there being no trace of bicarbonate of soda, whereas according to the formula of the Pharmaceutical Society (*sic*) it should have contained 30 grains. The officer pointed out that the real article was often required for medicinal purposes, and on that ground alone care should be taken to supply what might be required. The defendant said his firm had been carrying on business uninterruptedly for over sixty years, and this was the first time complaint had been made against them. As a matter of fact soda water supplied as required by the Pharmacopoeia instructions was unpalatable, but if required for medicinal purposes it should be asked for as "B. P." Mr. Slade said it was clear that the article sold to the inspector contained no bicarbonate of soda, and was not therefore soda water. He fined the defendant £3 and 12s. 6d. costs.—*Morning Advertiser*.

PROCEEDINGS UNDER THE PETROLEUM ACT.

BREACH OF THE REGULATIONS BY A CHEMIST.

On October 1, Lawrence Priestley, chemist, Newark, was charged under the Petroleum Act with keeping petroleum for sale in his shop, in form and quantities otherwise than ordered by the regulations of the said Act, without a licence. Chief Constable Challen said the section of the Act under which the prosecution was taken required that petroleum should not be kept except in pursuance of a licence from the local authority, but this section did not apply to petroleum kept for private use or for sale, provided the following conditions were complied with: 1. That it be kept in separate glass, earthenware, or metal vessels, each containing not more than a pint, and securely stopped. 2. That the aggregate amount kept, supposing the whole contents of the vessels to be in bulk, does not exceed three gallons. In this case he visited the defendant's shop, and there found about 3½ gallons of petroleum contained in a cask, and also without a label bearing the words, "highly inflammable." He drew the defendant's attention to the fact, who said he did not know that the law required him to take out a licence. Mr. Priestley said he was quite ignorant of the law with regard to petroleum, and since Mr. Challen called he had applied for a licence. The Bench said that he would only have to pay the costs of the case, but he must have a licence in future. Alderman Quibell asked the Chief Constable whether all private individuals who kept petroleum for their own use were obliged to keep it in pint vessels bearing a label? If so, he did not think the fact was generally known by the public. Chief Constable Challen said the Act applied to all petroleum, or any oil which gave off an inflammable vapour at a temperature of less than 73 degrees Fahrenheit, but not to common paraffin which was generally used.—*Nottingham Daily Express*.

* This name does not appear on the Register of Chemists and Druggists for 1894.

Correspondence.

BRAGANTIA WALLICHII.*

Sir,—Will you allow me, with reference to Mr. Hooper's paper on *Bragantia* (*ante*, p. 231), to mention that Dr. Solereder has shown that the stem I received under the name *Bragantia wallichii* cannot belong to that genus, nor even to the Aristolochiaceæ. Dr. Solereder's paper is entitled "Beiträge zur vergleichenden Anatomie der Aristolochiaceen," and is contained in Engler's 'Botanische Jahrbücher,' x. Band., 4 heft., p. 410.

41, Wellington Street, W.C. MAXWELL T. MASTERS.

Obituary.

Notice has been received of the death of the following:—

On September 16, Henry Thurlow, Chemist and Druggist, Lxworth. (Aged 56.)

On September 20, Samuel Wilson, Chemist and Druggist, Ashton-under-Lyne. (Aged 59.)

On September 22, John James, Chemist and Druggist, Liverpool. (Aged 48.)

On September 24, Tom Fletcher, Chemist and Druggist, Leeds. (Aged 62.)

On September 28, Thomas Watkinson, Pharmaceutical Chemist, Nottingham. (Aged 72.)

On September 28, Matthias Hair, Chemist and Druggist, Newcastle-on-Tyne. (Aged 57.)

Books, etc., received.

AN INTRODUCTION TO STRUCTURAL BOTANY. By D. H. SCOTT, M.A., Ph.D. Pp. i.-xii., 1 to 388, with 113 figures. 3s. 6d. London: A. and C. Black. From the Publishers.

THE SENILE HEART. By G. W. BALFOUR, M.D., LL.D., etc. Pp. i.-vi., 1 to 300. 5s. London: A. and C. Black. From the Publishers.

Diary of the Week.

TUESDAY, OCTOBER 9.

Royal Photographic Society, at 8 p.m.
Presentation of Medals and President's Address.

WEDNESDAY, OCTOBER 10.

British Pharmaceutical Conference, at 4.30 p.m.
Meeting of the Executive Committee.
Pharmaceutical Society of Great Britain.
Library, Museum, School, and House Committee.
Plymouth and District Chemists' Association.
Annual Meeting at the Foresters' Hall, at 2.30 p.m.
Annual Dinner at Matthews' Restaurant, at 7 p.m.

THURSDAY, OCTOBER 11.

Chemists' Assistants' Association, at 8.30 p.m.
Musical and Social Evening.
Sheffield School of Pharmacy, at 6 p.m.
Inaugural Meeting at the Cutlers' Hall. Address by Mr. Charles B. Allen.
Sheffield Pharmaceutical and Chemical Society, at 7.45 p.m.
Annual Dinner at the Cutlers' Hall.
Nottingham and Notts Chemists' Association, at 8.30 p.m.
Soiree at the Eagle Restaurant.
Liverpool Chemists' Association, at 7.30 p.m.
Conversations at the Royal Institution.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bayley, Buck, Clague, Clarkson, Cooks, Cross, Flux, Gane, Griffiths, Hill, Jewsbury and Brown, Jones, Macnaght, Marshall, Smith, Squire.

ANTI-DIPHTHERITIC SERUM.

The immunity of individuals against disease is understood to depend upon the destruction by certain agents of the supposed living cause of the disease. These agents may also act by hindering the growth of the living cause or by destroying its infectious properties, by the destruction of the poisonous material produced in the infected organism, or by imparting a higher degree of resisting power against the action of this poisonous material. Belief in the theory of phagocytosis—according to which certain cells of the body tissues possess the property of collecting about the infected region of the body and destroying by absorption the living bacteria supposed to cause the disease (see *Pharm. Journ.*, vol. liii., p. 307)—has been in great measure replaced by the assumption that the specific action of bacteria is due to toxalbumins or similar poisonous substances. These "toxins," as well as "antitoxins" or substances that establish immunity to specific diseases in animals, have been shown by Buchner to be probably the direct products of bacterial cells (see *Pharm. Journ.*, vol. liii., p. 352).

The treatment of disease by prepared blood serum is based upon the foregoing ideas with regard to immunity, and is now being very extensively adopted. In April, 1893, Behring and Kossel published the results obtained in the treatment of thirty cases of diphtheria by the injection of so-called antitoxin serum. This serum was obtained from the blood of animals rendered immune to the disease by the prolonged injection of minute but gradually increasing quantities of diphtheria toxin,* a fluid obtained by the cultivation of diphtheritic bacilli in nutrient broth. The success of the treatment, according to Behring and Kossel, was very remarkable, and more recently other observers—namely Ehrlich, Wassermann, and Roux—have confirmed their results.

The first step in the practical application of the process given in outline above is the preparation of the diphtheria toxin from cultivations of the specific bacillus of the disease. Flasks containing nutrient broth are inoculated with the bacilli and maintained for several weeks at a temperature of 37° C. At the expiration of this period of incubation the contents of the flasks are filtered through a Chamberland filter, which arrests the bacilli. An illustrated description of this filter, as employed by d'Arsonval, will be found in the *Pharmaceutical Journal* (vol. lii., p. 1034). The clear filtrate thus freed from organisms has a strong alkaline reaction. It is a virulent poison, and speedily causes death when injected into animals in comparatively small quantities: from this property it is called diphtheritic toxin. The toxin is injected into animals in minute but increasing quantities at intervals extending over some months, the initial doses being so small as to cause only transient symptoms, and it is found that animals so treated are finally

enabled to withstand the injection of such doses as would prove rapidly fatal to an uninoculated animal of the same weight. When the animal has been thus rendered immune, its milk and blood serum are stated to possess the remarkable property of protecting other animals from inoculation by the disease.

In order to obtain the serum, blood is withdrawn from the body and allowed to stand. It clots in a short time, the clot being composed of filaments of fibrin enclosing the blood corpuscles, and by the contraction of the clot the blood is separated into clot and serum, the latter being a pale clear fluid comprising practically the fluid part of blood, minus corpuscles and fibrin. The serum obtained in this way, from the blood of animals rendered immune, as previously described, constitutes the "antitoxin" used in the treatment of the disease, the name being derived from its antagonistic action to the "toxin" produced by the bacillus. It may be well to state here that nothing is known at present as to the nature of the substances to which the action of the toxin and antitoxin is due. From experiments on animals, the following results were obtained:—(1) by mixing the antitoxin in certain proportions with the toxin in a test-tube the latter is rendered harmless; (2) by first injecting the antitoxin, followed by the toxin, the same effect is produced; and (3) the toxin may be injected first, followed by the antitoxin: in this case a relatively larger quantity of antitoxin is required, and the interval between the injections must be brief.

The serum used in most of the cases reported was obtained from the horse. The animal is rendered immune by repeated injection over a period of two or three months, at the expiration of which its serum possesses very high antitoxic properties. The animal suffers in health but slightly if at all, and the operation of bleeding may be repeated two or three weeks after being first performed. It is even said to be possible with this animal, rendered immune as previously described, to withdraw about a kilo. of blood at once, and to repeat this from time to time, without any deterioration of the antitoxin obtained or danger to the animal, provided the injections of toxin be continued in the intervals between the blood-letting operations. The dog, goat, and sheep have also been employed, but the blood of the horse furnishes a more abundant and clearer serum than that of the other animals mentioned.

In the clinical application to diphtheria of this antitoxin method of treatment particular stress is laid upon the necessity of injecting the antitoxin as soon as possible after the onset of the disease, the most successful results being obtained within twenty-four hours. After this the protective effects of the antitoxin diminish rapidly, and at an advanced stage of the disease disappear altogether. The effects of the injection in diphtheria are almost immediately manifested in the reduction of temperature and pulse to the normal condition, and complications which usually follow the recovery by ordinary treatment are said to rarely occur in cases cured by the antitoxin treatment.

* The terms "toxin" and "antitoxin" are here applied generally to the liquids containing the active agents, and not specifically to the latter.

The dosage of the remedy is at present in rather an unsatisfactory condition, due, of course, to the lack of knowledge concerning the nature of the bodies to which the toxic and anti-toxic effects are due. Standardisation of the antitoxin therefore depends on the results of physiological experiments. Various systems of stating the strength of the serum have been proposed by Behring, Ehrlich, and Roux. These depend essentially upon the determination, in the first place, of the lethal dose for an animal, such as the guinea-pig, of known weight, of a toxin solution which has been prepared in sufficient quantity to form the standard for a large number of cases. The quantity of antitoxin which must be previously injected to protect the animal against this lethal dose is then determined, and the ratio between the weight of antitoxin and the body-weight of the animal furnishes a means of representing in certain units the strength of the solution. Thus, a sample of antitoxin may be said to have a strength of 50,000 when an animal is protected against its minimum lethal dose of toxin by the subsequent injection of $\frac{1}{5000}$ of its body weight of the antitoxin in question. The best quantity to use for a case of human diphtheria must ultimately, however, be determined by experience. About one-tenth of the full dose is said to be sufficient for prophylactic measures, and about one-fourth serves to arrest the progress of the disease in its incubation stage.

The numerous results which have been published seem to indicate considerable variation in the strength of the antitoxin supplied by different makers, the quantities injected varying from 0.5 to 20 cubic centimetres. It is to be hoped, therefore, that some means will be found before long of producing the antitoxin of definite and uniform strength. The antitoxin manufactured under Professor Behring's supervision is supplied in two strengths: No. I. in tubes containing 10 C.c., sufficing for the treatment of a case of ordinary severity occurring in children; No. II. is about 2½ times stronger than No. I., and the tubes contain 11.5 C.c. The latter is recommended for the treatment of adults or cases of exceptional severity in children. The antitoxin prepared at the Pasteur Institute is injected in doses of 20 C.c., one dose being usually sufficient.

Expectations are entertained by some investigators that other diseases, such as cholera, pneumonia, and tuberculosis, will also prove amenable to the same system of treatment. Tetanus has already been treated, but the course of the disease is so rapid that in only a few cases has an opportunity been afforded for the application of its specific antitoxin.

It is obvious that the preparation of these antitoxins is altogether beyond the range of pharmacy in this country, on account of legal restrictions. With regard to their preservation, the addition of some harmless antiseptic will probably be found necessary, and in handling the preparations pharmacists must adopt precautions similar to those employed in dealing with ordinary vaccine lymph, such as storage in a cool, dark place, with the least possible exposure to atmospheric influence, but still greater care will probably be requisite than in the case of lymph.

Practical Systematic Botany.

This branch of botany can be most advantageously studied during apprenticeship, for when a course of study at a school of pharmacy is begun, the pressure of work is usually so great, and time is so limited, that wasted hours and neglected opportunities are looked back upon with regret. The minimum requirements of pharmaceutical students in systematic botany comprise a knowledge of the classes and sub-classes of plants, and of the distinctive characters of forty-one medicinal plants. Later on, an acquaintance with about twenty-eight natural orders and seventy of the principal genera is necessary.

It is not suggested for one moment that this is all that is required in botany, but it is merely desired to point out here that morphological and systematic botany may be advantageously studied during apprenticeship, so as to economise the limited time that can be given to the whole subject during the usual year's course of study before qualification, and to leave more time for the study of vegetable histology and physiological botany, in which the help of a teacher is more especially needed.

The best time to study plants is undoubtedly during the spring and summer months, from April to September. These months, during the first year of apprenticeship, may be devoted to the examination, comparison, and naming of the different parts of plants, commencing with such indigenous medicinal plants as are procurable. For instance, a collection may be made of leaves of different forms, arranged side by side for comparison. These will be available for subsequent microscopical work if required. When these are mastered, a similar collection of flowers and inflorescences may be made, and so on, passing through all the parts of a plant. A little practice will soon show how difficult it is to define exactly the shape of a leaf, and how various terms must be combined to convey an accurate idea to the mind of any leaf, flower, or inflorescence, etc.

The best plan to adopt in making such collections is to follow a chapter in a text-book on botany* and collect all the forms mentioned in it that are available, or a glossary in which the terms applied to each organ are collected together. For this purpose Holmes' 'Botanical Note-book,' obtainable from Dulau and Co., London, will answer admirably.

When the principal names applied to the variations in the different organs of plants are understood, the next step is to attempt to describe a plant. For this purpose indigenous medicinal plants should be first chosen, as the description can be subsequently checked by the description given in the Pharmacopœia or in a Flora. The schedules in the 'Botanical Note-book' mentioned will be found a useful guide as to the method of describing a plant. There are sixty schedules given, and by the time these are conscientiously filled up, the glossary will have been gone through sixty times.

* Some of the most portable and convenient books for this purpose are Silver's 'Outlines of Botany' (Renshaw, 306, Strand), an old but very useful book; Bentley's 'Student's Guide to Structural, Morphological and Physiological Botany' (Churchill); Lindley's 'School Botany' (Bradbury, Agnew and Co.).

and the student who has not by that time acquired a familiarity with the meaning of the terms employed is never likely to do so. The power of remembering the terms used will depend somewhat upon whether the student possesses a knowledge of Greek or not, since many of the terms are derived from that language. If he has not he should pay particular attention to the derivations of the names and their meaning * given in the glossary, since many of the same Greek words also occur in chemistry. The mastery of this branch of the subject is absolutely necessary to further progress. As the carpenter by frequent use of his tools gets to understand their uses and capability, so the student must use botanical terms often, if he wishes to have a clear conception of their meaning. It is not sufficient to read about them or even to learn them by rote. He must see the things to which the name applies. The writer has known students who, having an excellent memory, could give a parrot-like definition of almost any botanical term, but could not recognise the parts they had described when shown to them. There is no more effectual way of learning botany than by examining the plants themselves and attempting to describe them.

When the power of describing a plant in ordinary botanical language is acquired, which should be by the end of the second September, the third summer may be devoted to classifying plants.

Here a word of warning is necessary. If progress is to be made, and mistakes and pitfalls avoided, a definite rule must be invariably followed. The class must first be determined, then the subclass, and lastly the natural order. Any attempt to guess at the natural order before going through the preliminary examination as to class and subclass is sure sooner or later to lead to mistakes and waste of time. The "short cut" will prove "the long way round." Exception to rules in classification, of course, occur, but they are comparatively few in number; most of these are indicated in the book already referred to, but in any case of real difficulty the "Notes and Queries" column in this Journal is available for help.

The study of the natural orders may be commenced somewhat in the following manner. A number of different plants are collected, with fairly conspicuous flowers, and a few ferns. The specimens may then be sorted out into three parts: 1st, in which the leaves have the small veinlets forming a network, as in the hazel; 2nd, in which the veinlets are parallel, as in grass, lily, or iris leaves; and 3rd, in which they are forked, as in ferns.

If the flowers of these groups be examined, it will be found that the plants with the reticulated veinlets have the flowers, with few exceptions, arranged in rows of five parts or a multiple of five: or in rare cases, by suppression of one part, the number is four. The plants with parallel-veined leaves will have the parts arranged in rows of three or a multiple of it, and the ferns will have no visible flowers. These three groups form the principal divisions of the vegetable kingdom, and it is absolutely necessary, as a first step, to deter-

mine to which of these groups any plant belongs. The student may next cut thin transverse sections of the stems of each group and examine them on a dark surface, such as a coat sleeve, with a good lens, preferably a platyscopic one, or a 1-inch objective from a microscope. He will find in the plants having reticulated veinlets and four or five parts to the flower, that the section of the stem will show a central pith with a definite ring around it (dicotyledon). In the stems of the plants with flowers in three parts he will find that the sections are dotted over with whitish points (of woody and vascular tissue—monocotyledon), but that there is no definite pith with a ring outside it, and in the fern he will find that there is an irregular ring (acotyledon). By this test he will always be able to determine to which class a plant belongs, if the flowers and leaves should seem anomalous. Thus, in some of the docks (*Rumex*) there are net-veined leaves and three-parted flowers, but the stem when cut shows the woody ring outside the pith. On the other hand, in the black bryony (*Tamus*) the flowers are also three-parted and the leaves reticulate-veined, but the stem section shows the woody tissue in scattered dots, indicating at once that the two plants belong to different classes, although similar to each other in the character of the leaves and flowers.

(To be continued.)

PHOTOGRAPHY AND ITS SCIENTIFIC APPLICATIONS.*

BY SIR HENRY TRUEMAN WOOD.

It is not so very long since photography occupied a very subordinate position in the world alike of science and of art. Scientific men looked on photography as a mere art, artists regarded it as a mere science. About twenty years ago, when I suggested that some improvement in a photographic process—I forget now which—ought to be brought before the Physical Section of the British Association, I was told that there was nothing scientific about photography, that it was a mere empirical pursuit, unworthy the attention of serious students of science.

And to a large extent the reproach was well deserved. Though the list of the earliest workers in photography contains many illustrious names, yet it is true that a large proportion of the most important contributions to photographic knowledge were not made by scientific workers, or by men who worked in scientific methods. They were obtained by practical men, seeking for results, often indeed seeking for them successfully by methods which could not have commended themselves to men better equipped with scientific knowledge. Of course this was the consequence of the fact that photographic science was early associated with photographic practice, and the same remark holds good of other sciences, electricity for instance, in which theory and application to practical use advance with equal steps; but I think it applies more to photography than to any other.

At the present time, we have indeed reached a very different condition of things. All the most striking of

* The meaning of botanical names may be found in Cooke's 'Manual of Botanic Terms' (Hardwicke), and Alcock's 'Botanical Names for English Readers' (Lovell, Reeve and Co.).

* Extracted from the presidential address to the Royal Photographic Society, October, 9, 1894.

the recent advances in the science are the result of elaborate scientific research. The most recent improvements in lenses were the fruit of long and laborious investigation into the optical properties and the chemical nature of certain sorts of glass. The increased speed of modern plates, and their improved power of rendering colour values more truly, have only been obtained by minute knowledge of the condition of the problem to be solved, and by careful application of the most recent results of chemical and physical research. If the old photographic crux, the reproduction of colour, has been solved, or, at all events, if a possible method has been indicated for its solution, it was not by haphazard experiment, but by careful adjustment of means to secure an anticipated result. Nowadays, we can only hope for improvement by utilising the advance of scientific knowledge.

But if the present position of photography is due to progress in the kindred sciences, how amply has she repaid the debt! There is not a single branch of science in which photography is not largely used. There are many whose progress is now absolutely dependent on the power of the camera to observe more accurately, more independently, more minutely, more rapidly, more permanently, than the human eye. If, as appears to be the case, we have reached the limits of human vision, aided by the most delicate instruments that can be constructed, it is difficult to imagine what limits need be set to photographic vision, can we but construct instruments of accuracy sufficient to allow its full powers to be utilised.

I imagine that the first application of photography to a scientific purpose must have been when Dr. Draper, in New York, photographed the moon. Whether the pictures he obtained were of any astronomical value I do not know; certainly those taken a little later, in 1852, by Dr. Warren de la Rue, were, and they were the precursors of the long series of astronomical photographs, culminating in Dr. Common's nebula of Orion, and in the great work of charting the heavens by photography which is now in progress.

The advantages of the "retina which never forgets," and it might be added which never tires, which accumulates weak impressions and stores them up till they become one strong one, were long since recognised by De la Rue, and I suppose it will not be very long before, for astronomical purposes, eye observations are entirely superseded by photographic. The photographic camera is now an indispensable adjunct to every large telescope, if indeed it would not be equally correct to say that the telescope is an adjunct to the camera, since the astronomical telescope tends more and more to assimilate to the form adopted long since by Mr. Rutherford, in which the visual rays are of but slight importance, and the chief attention is given to the accurate utilisation of the more chemically active rays at the violet end of the spectrum.

In his recent address to the Photographic Convention at Dublin, Sir Howard Grubb, than whom nobody is better qualified to speak on the subject, dwelt on the services which photography has rendered to astronomy, and gave several striking illustrations of

those services. Indeed, if one not qualified to speak on such matters with any authority might hazard an opinion, it would almost seem as if the power of recording observations had already outstripped the capacity for examining the observations, and drawing conclusions from them. When we are told that a photographic plate has recorded 10,000 stars in an area not containing a single visible star, one may be excused an expression of wonder as to how the human mind is ever to grapple with problems of such infinite complexity, to turn to useful account observations dealing with such enormous multitudes.

But if the telescope has lately become one of the most important of photographic appliances, the spectroscope may be said to have held that position almost since its introduction. Professor Norman Lockyer, in his well-known text-book, attributes to Sir John Herschel the first suggestion of spectrum photography, and we find that in 1839 he pointed out that the way to investigate sensitiveness was to photograph the spectrum. In the following year he read a paper describing his results of spectrum photography. A little later, in 1842, Becquerel and Draper were both at work photographing the solar spectrum. Twenty years later (in 1864), Miller was turning to practical account the power of photography to record the parts of the spectrum beyond the limits of human vision, and from that date nearly all spectroscopic work has been photographic work. Whether applied to astronomical observation or chemical research, the spectroscope has always been combined with the camera, and it is by the combination of the two instruments that such wonderful results have been attained; and as photographic methods have improved, so have fresh facilities been afforded to the spectroscopic worker. Norman Lockyer's earlier work was of necessity done with wet plates, but with the plates now available, he is producing star spectra on a scale comparable with the solar spectra of twenty-five years ago. Rutherford's recent maps of the solar spectrum could not have been produced without the use of colour-sensitive plates; while in one of the most recent attempts to employ spectroscopic analysis for practical metallurgy, Professor Hartley tells us that he also used orthochromatic plates, specially prepared, and that after trying various developers, he found hydroquinone the best.

As an automatic recorder of scientific observations, photography seems to have been utilised in the Royal Observatory about 1847.

The principle thus first applied at Greenwich has received numerous other applications, and, indeed, it is now a matter of course that photographic methods should be used to register the movements of any instrument of whose indications it is desired to preserve a record. Instances are of course numerous in which no other method is possible. Hardly any but a photographic method could register the movements of the light spot of a reflecting galvanometer and thus enable the physicist who, like Langley, is measuring the heat radiated from celestial bodies, to record the minutest differences of temperature; the chemist, like Dewar, who is producing hardly imaginable cold, to record temperatures approaching absolute

zero; the metallurgist, like Roberts-Austen, who is dealing with the melting points of metals, to register by a photographically traced curve variations in high temperatures which, but a short time ago, could not be accurately measured at all. It is interesting to read the testimony of the last named, given at the last Conference of the Camera Club, to the effect that he could not conceive of any method which would give such results in the same space and time. Equally interesting is it to note the professor's suggestion for a practical method of recording continuously the temperature of the air-supply of a blast furnace, a matter of great importance to the iron manufacturer, of which he says:—"If we had no photography it would be impossible to get a record which would be anything like so true."

Numerous other instances will occur to many of you in which photography has been or might be—indeed I may say will be—applied to similar purposes. I will only refer to one, because it appears to me so excellent an instance of the delicacy of the method. At the last, the Oxford, meeting of the British Association, Mr. Burch showed to the newly-formed Physiological Section photographic records taken with the aid of the capillary electrometer of electric currents produced by speaking into the telephone. The letter z produced a complicated curve in which oscillations of current lasting only 1-3000 sec. were visible with a lens.

It seems hardly worth while to trouble you with the details of many of the other services which photography has rendered to science, and if I were to attempt an exhaustive list, there are many present to-night who could supplement it out of their own knowledge. The meteorologist has been enabled by its aid to study the form and nature of clouds, the shape and character of the lightning flash. The zoologist has been taught much about animal motion. The microscopist has long learnt to rely on the camera as the only accurate means of reproducing the objects of his studies. The physicist has by photographic methods investigated many phenomena in which the changes are too rapid for the human eye to follow them. By such means Lord Rayleigh and Professor Boys have obtained long series of pictures of occurrences which all took place within a fraction of a second, thus almost analysing time as the chemist analyses matter.

The uses of photography in ethnology, geology, geography, natural history, archaeology, are too obvious to need mention. They, and many other applications, may be summed up in the remark, that whenever the observer of natural phenomena requires to make an accurate record of his observations, photography supplies the means. It also supplies the means of showing to a roomful of spectators what could otherwise be seen by but a single observer at one time, and has thus rendered to the popularisation of science no less a service than it has led to its advancement. The universal use of photography for purposes of demonstration must certainly not be forgotten in however brief a summary of its applications.

HIGHER EDUCATION FOR THE PHARMACIST.

BY JOHN M. FRANCIS.

The hearty support accorded this idea by the leading spirits of the pharmaceutical profession at the meeting of the Seventh International Pharmaceutical Congress at Chicago, points to the fact that the profession is awakening to its own weakness, and is beginning to see that the remedy lies within itself.

Every druggist is ready to concede that something is wrong—and when I say "druggist" I mean both the proprietor and the dispensing pharmacist, who is or who hopes to be a proprietor. This lack of proper tone is ascribed by different individuals to various causes: one complains of cutting; another, of competition by merchants; then the soda-water nuisance, the cigar counter, etc., are imprecated. The proprietors complain of inefficient help and the salaried pharmacist of low wages. A moment's thought will plainly show where our chief difficulty lies; these evils are all the outgrowth of competition—not healthy, well-regulated competition, which insures pure medicines and polite attention, but the senseless, frantic struggle for place or for sales, which does not allow a reasonable profit for the proprietor or a living salary for his employees; a competition which prostitutes the noble art of pharmacy to the level of the "cure-all" vendor.

Too many pharmacies and too many pharmacists. How may this unhealthy state of affairs be remedied? We answer unhesitatingly: By educating the pharmacists; by weeding out the incapables who drag it down to the plane of vulgar dickering. Do this, and the business will correct itself.

The indignant response is heard: "There are in our ranks men as highly educated, both professionally and otherwise, as are found in any walk of life." True, and these are the men who have pledged themselves to the very reform we are advocating; when we speak of a profession we refer not to the shining lights, not to the few who show of what it is capable, but to the rank and file—each and all who go to make up its *personnel*.

Is pharmacy a profession or a trade? In other words, are the men who prepare and distribute the agents of our physical conservation or destruction, as it may be, to class themselves with those noble orders whose members must undergo years of preparation, involving the highest mental and technical training, or are they content to be numbered among those from whom nothing more is demanded than a familiarity with routine work and shop details? Are their intellectual attainments to be no higher than be necessary to sell a box of pills or measure an ounce of tincture of opium, as the grocer's clerk would a bar of soap or a pint of molasses? Surely no pharmacist will answer in the affirmative. When the boy wishes to learn the trade of shoemaker, he undergoes no particular mental preparation; he serves under the personal direction of some one who follows the trade until he learns shop details, how to handle his tools, what one individual can teach him, and he has his trade. He spends no time delving in the stores of experience and logical thought accumulated by those who have preceded him; furthermore, his lack of knowledge or

expertness does not entail any serious consequences upon his patrons. Can the same be said concerning the pharmacist, who may be so potent a factor for good or evil? He is one of the last arbiters of the fate of man, so far as this existence is concerned. Menaced humanity turns to the physician and the pharmacist for help, and how censurable is he who offers himself as a pillar of safety when in reality he forms only an insecure support!

Pharmacy is not a trade, but a profession—one of the noblest and most responsible; and we have a right to demand for it men of the highest qualifications, no matter how arduous the task of preparation may be. If the aspirant has not the physical or mental stamina to undergo the necessary preparation, let him enter some walk of life whose responsibility is less. Make this the touchstone of preferment, and competition will be reduced, pharmacists will cease to depend on side-lines for their profits, none but the deserving will ask for our patronage, and they will be rewarded as they deserve.

We must bestir ourselves and keep abreast of the times; the things which were good enough for our fathers are not good enough for us. Conservatism is as bad a master as ignorance. The scope of modern pharmacy has been enormously extended, even during the last ten years; the man of drugs depends less and less on the direct productions of nature; he does not deal so much in "roots, barks, and herbs made for the healing of the nations," but the whole universe is ransacked for his benefit.

The gross forms in which nature puts up her medicines is being criticised. The most magic powers of chemistry are brought into play, and from these bundles of inert tissues and cells the "active principles" are extracted, so that the nauseous dose of yesterday is dispensed to-day in a minute capsule. Not content with what we find made to hand, we tear asunder and build up compounds, invading even the innermost molecules, and compelling them to pass in review before us. These new remedies are to-day numbered by hundreds, and the list is constantly increasing; some are worthless and some are invaluable. In order to understand something of these, to dispense them properly, to discriminate between the good and the bad, the pharmacist must know some chemistry. Precedent no longer serves for a guide. Modern progress and commercial methods alike render it necessary that he should be conversant with botany and materia medica in their latest developments.

How is the would-be pharmacist to attain such an education? Not by serving a certain number of years behind the counter; not by reading at night when body and soul are weary; not by spasmodic efforts, but by patient continued effort under good teachers, in the most favourable environment, having at his command the best modern appliances of his art. He must be free to apply himself unreservedly to study and investigation. Such a system of study will broaden and train his faculties as nothing else will. Cramming or mental stuffing may enable the student to pass a board of examination, but leaves him with a mental indigestion from which he never recovers.

It follows, as a matter of course, that there must be an educational basis on which to rear this scientific superstructure; the proper place to obtain this is in our common schools, which are accessible to all at almost no cost. The fact is, our young men are in too great a hurry to enter professional life; the national unrest pervades all ages.

The question arises: Shall the applicant for pharmaceutical honours be forced to meet certain pharmaceutical requirements?

The welfare of the body politic is paramount to that of the individual; we have a right to demand that our professional servants keep abreast of the times, and such wise limitations will work no injustice. He who has the will and capacity to make a good pharmacist will find them no burden; they will rather serve to relieve him of the competition of the unworthy.—*Pacific Druggist*.

OPIMUM TRADE OF ISPAHAN, PERSIA.

At the first, this crop (1893) was not expected to be a good one, as the severe frosts in spring severely damaged the young crops; on the whole, the output has not been a real good one, but it has been somewhat better than was thought. Large quantities were brought in from Burugird (about 6000 mäs); this opium is not used for direct exportation, as it is not very good, being deficient in morphine, on the average it only containing some $7\frac{1}{2}$ to 8 per cent., whilst 10 to $11\frac{1}{2}$ per cent. is the amount admissible. It is used for internal consumption and for adulterating such opium as contains morphine above the required quantity. In London and China the markets were not too favourable, and did not encourage the exporter, but latterly, owing to the high exchange, the market has become more open, and the export can be carried out at a profit, consequently some 2200 boxes in all have been accounted for; the present prices range higher than ever previously known. In late years there has been a decided decrease in the output of this crop. A few years ago an average crop would be returned at 4000 boxes; in 1889, a fair year, it was about 3000; last year it was only about some 2000. It would appear that Persian opium has lost some of its hold on the China market, and thus the cultivation of it in this district has been somewhat discouraged. But also it seems that the cultivator is working out his ground. Year after year he plants the same succession of crops, getting sometimes as many as three crops from it. He does not plough deep, nor does he manure heavily, but only top dresses; in consequence, it is found that a jereeb which used to give a crop of 2 mäs now only gives from $\frac{1}{2}$ to $\frac{3}{4}$ of a mäs of opium. For the present year an area has been planted which is calculated to give some 2500 boxes. It is anticipated that in the following year a very much larger quantity will be planted. The Persian merchants are looking with keen and anxious eyes to the proceedings of the Opium Commission in India, and their future conduct will be greatly biased by its report.—*Consular Report*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, OCTOBER 13, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

SCHOLARSHIPS FOR PHARMACEUTICAL STUDENTS.

As part of the work carried out by the Pharmaceutical Society for the purpose of promoting a uniform system of education, the provision made for the award of Scholarships is no less important than the maintenance of the School of Pharmacy at Bloomsbury Square. Unlike the prizes given by the Council to the successful competitors in the several class examinations held at the close of each session of the School, the various scholarships are annually obtainable by any subscribing students of the Society who have attained a certain age and have been for three years engaged in the pharmacy of a registered pharmaceutical chemist or chemist and druggist. Eligibility as a student of the Society does not require anything beyond evidence of having passed the First examination or its accepted equivalent. Consequently, the majority of chemists and druggists' apprentices, if not all, should be in a position to present themselves as candidates for the Jacob Bell Scholarships at the termination of their apprenticeship, or very soon after. In order to facilitate the candidature of apprentices throughout the provinces, the examinations are held annually at forty-two provincial centres. The subjects of this examination are very simple, comprising Latin, French or German, English, and Arithmetic, together with elementary Chemistry, Pharmacy, and Botany. The nature of the questions in each of these subjects may be judged of from the publication of those set each year in the Journal after the completion of the examination. It will there be seen that the candidates are not expected to possess such a knowledge as would enable them to pass the examination by which qualification as a chemist and druggist is obtained.

With the exception of the elementary science the examination does not go much beyond what is required in the Preliminary, and it may be safely stated that any chemist's apprentice should in three years have learnt enough of the additional subjects to acquit himself creditably as a candidate for a Bell Scholarship. The same holds good of the Manchester Association Scholarship, and the fact of the competition for it being limited only renders the absence of competitors the more remarkable. The intrinsic value of a Bell Scholarship ought to be in itself a great inducement to apprentices to enter into competition. In addition to the money payment of thirty pounds, free admission to the laboratory and lectures of the School of Pharmacy is granted for the year. Opportunity is thus afforded for becoming a Pereira medallist, and reference to the Calendar will show that the position acquired by a Bell scholar is an important step towards securing that great pharmaceutical distinction.

The particulars stated above are matter of common cognisance, or at least should be so, since they are fully set forth in the Society's Calendar every year. But notwithstanding that circumstance, the advantages to be gained by competing for scholarships have not hitherto met with so much consideration as they deserve. In the address delivered by Mr. C. B. ALLEN at the inaugural meeting of the school connected with the Sheffield Pharmaceutical and Chemical Society on Thursday last, attention was particularly directed to this matter. From a comparison of the number of competitors for the Bell Scholarships, during the past ten years, with the number of those who were qualified to compete, it appears that the disproportion is so enormous as to appear "almost ridiculous" (see p. 305). On previous occasions regret has been expressed that so few young pharmacists come forward to compete for the Bell Scholarships; but it has been chiefly among the examiners that this view has been entertained, and Mr. ALLEN has done good service by referring to the matter under conditions which may be expected to ensure a wider consideration of the advantages which are now too much overlooked.

It is not, however, merely the possibility of winning a Bell Scholarship that is to be regarded as a powerful inducement to enter as a candidate. There can, of course, be only two successful competitors each year; but what may be regarded as a still greater advantage resulting from the award of these and other scholarships, provided the competition for them were more extended, is the occupation of students' minds with the subjects of the examination, and the consequent instruction that might be acquired during the period of apprentice-

ship. That alone would be a substantial acquisition of incalculable value, whether the scholarship was gained or not. If the prosecution of study with a view to competing for the Bell Scholarships were made a general practice during apprenticeship, a very efficient compensation for the want of a compulsory curriculum would be provided. Apprentices in the provinces as well as in the metropolis and in the larger towns would thus be usefully advanced towards satisfying the requirements of the Boards of Examiners when they seek to obtain qualification as chemists and druggists. We trust, therefore, that Mr. ALLEN'S statistical demonstration of the neglect hitherto prevailing the desirability of competing for scholarships will not continue in future to be lost sight of, either by apprentices or their masters.

THE SALE OF CARBOLIC ACID.

In commenting upon the frequency of poisoning by carbolic acid, the *British Medical Journal* insists upon the necessity of distinguishing such poisonous articles from articles of food and drink or ordinary domestic commodities. It is urged that the indiscriminate sale of both kinds of articles by grocers and general dealers of all kinds, as in the case of carbolic acid, involves serious risk to the public, which the Pharmacy Act was intended by the legislature to prevent. The mere association of such a poisonous material as carbolic acid with the harmless articles of domestic utility creates a danger by leading purchasers to suppose no greater caution is required in one case than in the other, and by giving undue facilities for obtaining poison. As in the case of other poisons, that danger can be guarded against only by keeping the supply of poisons as a matter of trade absolutely apart from that of the more ordinary necessities of daily life.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

In a circular issued by the Council of this Association it is pointed out that, at the last annual meeting a resolution was unanimously carried urging the Council to make an effort to secure the hearty co-operation of every chemist in the town and district in the work of the Association. The present unsatisfactory condition of pharmacy is stated to be owing chiefly to the want of union amongst pharmacists, and in view of the fact that a federation of local chemists' associations has been formed, which affords a basis for all the associations in the country to work in harmony, it is therefore most desirable that each local association should have the active support of every chemist in its district. The Nottingham and Notts Chemists' Association is one of the oldest kind in the kingdom, and its constitution affords scope for dealing not only with educational matters but also with any question of pharmaceutical politics that may be brought forward. Local pharmacists are therefore asked, in their own interest as well as for the general good of the trade, to become members. Arrangements are being made to hold during the coming winter a series of bi-monthly meetings, which will be of a social character, and open for the discussion of

trade matters. Due notice of these will be given. Any further information will be furnished by the honorary secretary, Mr. WILLIAM GILL, 207, Radford Road, Nottingham.

THE SERUM TREATMENT OF DIPHTHERIA.

THOUGH the published information relating to this subject is not only meagre but in some particulars contradictory, we have endeavoured to gather from the accounts recently given some indication of the method by which a product suitable for medical use is to be obtained, as that is the point of chief interest to our readers (see page 291). In the *Daily Telegraph* of Monday last there was a long article on "The New Diphtheritic Cure," evidently written under the influence of the sensation created by Professor Behring's paper, read at the meeting of naturalists and physicians in Vienna. The facts there stated are the same as those mentioned in this Journal last week (see p. 278), but the comments upon them appear to have a more confident tone than the present slender knowledge of the subject altogether justifies. Thus, for instance, the statement that as a material for injection "serum is absolutely innocuous" appears much too positive even if it be certain that its effects are useful.

MR. OCTAVIUS CORDER.

At the last meeting of the Board of Examiners in London, a resolution recording the sense of the Board of the services rendered by Mr. OCTAVIUS CORDER during the twenty-one years he has been an examiner, and assuring him of the respect and good wishes of his colleagues was most cordially adopted. Mr. CORDER is ineligible for future election under Section X of the Bye-laws.

BENEVOLENT FUND.

THE names of the seven approved candidates for the election of four annuitants in December next will be found, together with particulars of their respective cases among the official notices at page 5 of the advertisement matter.

WATT'S DICTIONARY OF CHEMISTRY.

THE fourth volume of this important work has just been published, and British chemists have now a complete work of reference adapted to the present position of the science. Owing to the lapse of six years since the first volume of the dictionary was published, the contents of the earlier volumes will require to be supplemented with the results of investigations carried out meanwhile, and it is to be hoped that this want will be provided for, as in the previous edition, by the early issue of a supplementary volume.

JAPANESE PLANTS.

It may interest some of our readers to know that herbarium specimens of Japanese plants, both phanerogams and cryptogams, can be procured, some specimens that have been sent over as samples being excellent. They are carefully dried and mounted, each specimen being protected by a tough tissue paper, through which the plant may be seen. The enterprising Japanese who supplies these specimens is also a seedsman, and his address is Keugo Saito, Kosobe, near Takatouki Station, Osaka, Japan.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 10th inst., the Librarian presented the following report of donations to the Society's Libraries.

To the Library in London.

- Royal Society of New South Wales :**
Journal and Proceedings, vol. 27.
- Institute of Chemistry, London :**
Regulations and Register, 1894.
- University of Glasgow :**
Calendar, 1894.
- University of Edinburgh :**
Calendar, 1894.
- University College, Bristol :**
Calendar, 1894.
- Owens College, Manchester :**
Calendar, 1894.
- Yorkshire College, Leeds :**
Calendar, 1894.
- School of Medicine, Edinburgh :**
Official Calendar, 1894.
- Professor Attfield, London :**
Chemistry, 14th (U.S.) ed., 1894.
- C. A. Barber, M.A., St. John's, Antigua :**
Four supplements to the Leeward Islands Gazette. Agricultural Journal of the Leeward Islands, no. 1. The treatment of diseased sugar canes in the West Indies, 1894.
- Fritzsche Brothers, New York :**
Descriptive catalogue of essential oils and organic chemical preparations, by F. B. Power.
- Institution of Civil Engineers, London :**
List of members, 1894.
- U.S. Bureau of Education, Washington :**
Statistics of public libraries in the U.S. and Canada, by Weston Flint.
- Dr. C. O. Curtman, St. Louis, U.S. :**
Lessons in qualitative and volumetric analysis, 4th ed., 1894.
- H.M. Secretary of State for India :**
The Bower manuscript, edited by A. F. R. Hoernle, part 1 ; part 2, fasc. 1, 1893-94.
- Herr K. Disterich, Helfenberg :**
Helfenberger Annalen, 1893.
- Ontario College of Pharmacy :**
Annual Announcement, 1894.
- Mr. W. West, Bradford :**
On some freshwater algae from the West Indies.
- Mr. J. C. Sawyer, Brighton :**
Rhodologia, 1894.

To the Library in Edinburgh.

- Ontario College of Pharmacy :**
Annual Announcement, 1894.

EXAMINATIONS IN LONDON.

October, 1894.

(Continued from p. 284).

MINOR EXAMINATION—PASS LIST.

Candidates examined.....	228
„ failed	150
„ passed	78

Amis, Albert Edward.
Angel, Edward Charles.

Appleyard, Percy.
Ault, Percy.
Bates, Sydney Lancaster.
Benjamin, Joseph.
Bennett, Frederick.
Brack, David George.
Brewer, Walter Joseph.
Bryant, Nicholas John Andrew.
Charles, Thomas Watkin.
Charlesworth, Charles Edward.
Clarke, John George.
Cleghorn, James.
Cocker, Lewis Alexander.
Cole, Arthur.
Couldery, George Etches.
Coward, Miles.
Cullwick, John Henry.
Dawney, Charles Benjamin.
Dickinson, William.
Durbin, Henry Eastman.
Evans, David.
Fisher, George William.
Freeman, Alfred Percy.
Garwood, George James.
Gibson, George Shaw.
Griffiths, Frederick Gray.
Harrison, John George.
Hemming, John Wilson.
Hewitt, Silas.
Holroyd, James.
Hutchinson, James Herbert.
Jenkins, Morris William.
Jones, William Miall.
Lengden, Alfred.
Martin, John Woolcock.
Massey, Cecil.
Mitchell, Henry Searle.
Moody, William Edmondson.
Morrey, George.
Moultrie, George Briggs.
Neal, Frederic.
Neathercoat, Harry William.
Ockwell, Edwin.
Pearce, William Forward.
Potter, Henry Arthur.
Pratt, George Joseph.
Rist, William King.
Rogers, Frank.
Rosster, Samuel.
Ruxton, James.
Scruby, John Charles.
Smith, Charles.
Steeds, Frederick George.
Stelfox, Walter Edmund.
Stratton, William George.
Swaffin, John Phillips.
Tattersall, John.
Taylor, Archibald Leonard.
Taylor, Arthur Ernest.
Taylor, Charles John.
Taylor, Thomas Rolf.
Thomas, Hugh William.
Thomas, John Oliver.
Thompson, Edward John.
Tully, Fred Herman.
Tutt, George Francis.
Wallis, Robert Acrid.
Wardley, Thomas.
Webb, Joseph John.
White, Henry Fox.
Williams, David Isaac.
Williams, John (Bagillt).
Williams, John (Corwen).
Wilson, Arthur Frederick.
Wood, Arthur Henry.
Woodliffe, Henry Grayson.

MODIFIED EXAMINATION—PASS LIST.

Candidate examined and failed..... 1

FIRST EXAMINATION—PASS LIST.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination.

Brown, Harold Edwin.....Hull.
 Carey, Frank Russell.....London.
 Dunn, William Robinson.....Blackheath.
 Finn, Francis Dudley.....Dover.
 Gibb, William C. N.....Winchester.
 Jarrett, Jarret Roberts.....Trawsfynydd.
 Jealous, Bernard.....London.
 Laws, Thomas Cresswell.....London.
 MacGregor, John.....Glasgow.
 Moore, Lucy Bramley.....London.
 Nelson, George.....Oldham.
 Palmer, William.....Lynn.
 Pyman, Frank.....Stowmarket.
 Stanley, John.....Leamington.
 Sykes, Richard Alfred.....Manchester.
 Wilson, Francis M.....Stowmarket.
 Wilson, Robert William.....Sunderland.

EXAMINATIONS IN EDINBURGH.

October, 1894.

MAJOR EXAMINATION—PASS LIST.

Candidates examined and passed..... 2

Elder, Alexander.
 McKenzie, Thomas.

MINOR EXAMINATION—PASS LIST.

Candidates examined..... 91

" failed 46

" passed 45

Adams, George Cuthbert.
 Alook, James Elsworth.
 Allan, William.
 Allison, John Robert Billyard.
 Atherton, William.
 Bain, James.
 Blount, George Wright.
 Buse, John.
 Dean, Arthur Shiera.
 Duncan, James George.
 Eastwood, Horace.
 Ferguson, William Cross.
 Fyfe, John.
 Gilmour, Andrew.
 Gilmour, William.
 Hammond, Walter.
 Hughes, John Hampden.
 Japson, Ewart.
 Johnstone, John.
 Kingston, Walter Wright.
 Lamb, William Henry.
 Lawrence, Alexander.
 McIntosh, Alexander.
 McLeod, John Peter.
 McOwat, John Hogg.
 Marshall, John George.
 Mason, Alexander.
 Mirrilees, Arthur Houldsworth.
 Mundell, Stephen Robson.
 Pendlebury, James.

Proudfoot, William.
 Rhodes, Edwin Atkinson.
 Robertson, James George.
 Russell, John.
 Sanderson, George Alfred.
 Seel, Thomas.
 Shand, John Johnston.
 Smith, Westby.
 Steven, David.
 Taylor, William Stewart.
 Watson, David.
 Whaley, Charles Edward.
 Whitby, Harold Outhbert.
 Wolstenholme, Jesse.
 Wray, Thomas.

FIRST EXAMINATION QUESTIONS.

October 9, 1894.

LATIN.

Time allowed—from 11 a.m. to 12.30 p.m.

I. (For all Candidates.) Translate into Latin:—

1. The wise citizens will give books to their boys.
2. The boys would be punished by the learned judges.
3. He denies that disgraceful things can be useful.
4. Caesar leaves the city that he may command the army.
5. There is no doubt that they drove the virtuous men from the city.

II. Translate into English either A (Caesar) or B (Virgil).

(Candidates must not attempt both authors.)

A. CAESAR.

1. Ob eas causas ei munitioni, quam fecerat, T. Labienum legatum praefecit; ipse in Italiam magnis itineribus contendit, duasque ibi legiones conscribit et tres, quae circum Aquileiam hiemabant, ex hibernis educit, et, qua proximum iter in ulteriorem Galliam per Alpes erat, cum his quinque legionibus ire contendit. Ibi Centrones et Graloceli et Caturiges, locis superioribus occupatis, itinere exercitum prohibere conantur.

2. Si quos adversum proelium et fuga Gallorum commoveret, hos, si quaerere, reperire posse, diuturnitate belli defatigatis Gallis, Ariovistum, quem multos menses castris se ac paludibus tenuisset neque sui potestatem fecisset, desperantes jam de pugna et dispersos subito adortum magis ratione et consilio, quam virtute, viciasse. Cui rationi contra homines barbaros atque imperitos locus fuisset, hac ne ipsum quidem sperare nostros exercitus capi posse.

Grammatical Questions.

(For those only who take Caesar.)

1. Decline, in full (in the singular), *proximum iter*, and (in the plural) *duas legiones* (Par. 1).
2. Give the degrees of comparison of *dulcis*, *altus*, *maius*, *multus*, *digne*, *graviter*.
3. Give the principal parts of *spondeo*, *caveo*, *pareo*, *morgo*, *emo*, *limo*.
4. In what manner are direct interrogative sentences translated into Latin? Give examples.

B. VIRGIL.

1. Namque, sub ingenti lustrat dum singula templo, Regnam opperens; dum, quae fortuna sit urbi, Artificumque manus inter se operumque laborem Miratur; videt Iliaus ex ordine pugnas, Bellaque jam fama totum vulgata per orbem, Atridas, Priamumque, et saevum ambobus Achillen.
2. Neonon et vario noctem sermone trahebat Infelix Dido, longumque bibebat amorem,

Multa super Priamo rogatus, super Hectore multa;
Nunc, quibus Aurorae venisset filius armis;
Nunc, quales Diomedis equi; nunc, quantus Achilles.
"Immo, age, et a prima dic, hospes, origine nobis
Insidias," inquit, "Danaum, casusque tuorum,
Erroresque tuos; nam te jam septima portat
Omnibus errantem terris et fluctibus aestas."

Grammatical Questions.

(For those only who take Virgil.)

1. Decline, in full (in the singular), *Infelix Dido*, and (in the plural) *Errores tuos* (Par. 2).
2. Give the degrees of comparison of *dulcis*, *altus*, *malus*, *multus*, *digne*, *graviter*.
3. Give the principal parts of *spondeo*, *caveo*, *pasco*, *mergo*, *emo*, *lino*.
4. In what manner are direct interrogative sentences translated into Latin? Give examples.

ARITHMETIC.

Time allowed—from 12.30 p.m. to 2 p.m.

[The working of these questions, as well as the answers, must be written out in full.]

1. What will a piece of plate cost which weighs 3 lb. 4 oz. 5 dwt., if the price of silver be 2s. 8d. per oz., and the charge for workmanship £3 6s. per lb.?
2. The fore-wheel of a coach is $8\frac{1}{2}$ feet round, the hind wheel $12\frac{1}{2}$ feet round; how many more revolutions will the former make than the latter in the course of a mile and a quarter?
3. How much will $\frac{1}{2}$ of 78 $\frac{1}{2}$ yards amount to at 5s. 3d. for $\frac{1}{2}$ of 1 $\frac{1}{2}$ yards? (*Long Measure*.)
4. Simplify the following fraction, giving the answer to five places of decimals:—

$$5.001 + 2.01 - 3.0001 - 1.05$$

$$5.06 \times 3.001$$

*5. A beam is 14.14 metres long, 51.6 centimetres wide, and 174 millimetres thick. How many cubic metres does it contain?

6. If the carriage of 3 cwt. 3 qr. 14 lb. for 104 $\frac{1}{2}$ miles costs £1 14s. 10d., what should be charged for the carriage of 5 tons a distance of 93 miles?
7. A wine-merchant gains $\frac{1}{4}$ of the cost of a gallon of wine by selling it at 21s.; what would be his gain per cent. if he sold it at 22s. 6d.?

ENGLISH.

Time allowed—from 3 p.m. to 4.30 p.m.

1. Parse fully:—

"It becomes the throned monarch better than his crown."

2. What do you understand by (a) the Nominative Absolute, (b) Nouns in apposition, (c) the Indirect Object? Give one sentence in illustration of each.

3. Give the meaning and derivation of the following words:—*procrastination*, *braggart*, *amphibious*, *circumnavigate*, *antipathy*.

4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—once he asked tom daves whom he saw drest in a fine suit of clothes and what art thou to-night tom answered the thane of ross which it will be recollected is a very inconsiderable character o brave said johnson

*5. Write a short composition on one of the following subjects:—

- (i.) The Last Session of Parliament.
- (ii.) The Tower Bridge, or The Manchester Ship Canal, or The Tay Bridge.
- (iii.) Modern Improvements in Methods of Lighting.
- (iv.) "Content is a kingdom."

* This question must be attempted by every candidate.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The first meeting for the session 1894-95 was held at 103, Great Russell Street, on Thursday, October 4, the President, Mr. R. H. Jones, in the chair. After the usual preliminary business and the nomination of new members, the President read the following

INAUGURAL ADDRESS.

There have been so many addresses from this chair, urging very powerfully the claims of this Association, that in the address at the commencement of the eighteenth session, the honour of delivering which has devolved upon me, it would seem better to look in a different direction for matter on which to dilate. Possessing, however, less knowledge and experience than many present of subjects more seemingly interesting, I have thought advisable to again confine it, in a great measure, to the work of the Association, with the less hesitation in so doing, because the rôle of members changes largely year by year, and in the hope that a brief consideration of the claims made upon assistants may appeal as strongly as before, because now formed and presented by a retail assistant.

To anyone looking through the records of our meetings their utility is very apparent, and although the very number and varied nature of subjects dealt with have largely increased the difficulties of preparing later-day programmes, the more recent communications will bear comparison with those preceding, and take away all ground from any who delight in belittling present-day doings. The papers delivered have been, on the whole, just such as can be turned to practical advantage by an up-to-date pharmacist adding interest to many drugs as they pass through his hands, and calling attention to points only too liable to escape notice. Many useful notes solving dispensing difficulties have been given, often opportunely, on compounds of recent introduction, whereas some of the improved formulas and processes for the preparation and preservation of galenical products, described by some of our members, have been largely adopted. Probably but few assistants would confess their inability to appreciate this portion of our work, but a good many are fond of saying the number of contributions on these subjects are too few and infrequent. To them I would like to point out that for this and in many other matters, by devoting their own energies in the direction they think we need strengthening, they will find an easy remedy.

Several medical men, among them some of the most highly gifted and best known in their profession, have given us treatises on subjects such as simple physiology, and physiological chemistry, somewhat outside our own limits, but more than ordinarily interesting and instructive. Laboratory notes and processes for the analysis of urines, water, wine, etc., and the determination of certain drugs have been read at different times, and I have found them exceedingly useful for any such work, embodying as they do all the information a chemist requires for its performance, in compact form and free from the extraneous matter of the text book.

Some of the papers, of ultra-scientific tendency, have been, I venture to say, hardly within our scope. This Association, it must be remembered, is one for chemists' assistants, and, if it is to be a power among them, no thoughts of being a lesser light of the scientific societies may be entertained. Such subjects at our meetings are worthless. They can only be satisfactorily assimilated when delivered at proper lectures, by teachers understanding and explaining the difficulties likely to arise in their apprehension.

At any rate we must work nearer the level of the average assistant chemist, and if by extended education this rises, so that he can give an intelligent hearing to these papers, then it will be fit time to arrange them. As it is now, what can be expected of an assistant, say with the Minor qualification, coming to a meeting for the first time and hearing some of the highly edifying intricacies of synthetical science, but that he will leave with the feeling, not altogether without foundation, that we are too scientific to be of service to him?

More popular have been the evenings devoted, from time to time, to the discussion of matters of trade import, pharmaceutical politics, and educational topics. It is impossible to too strongly impress upon all the value of giving these attention and thought, of endeavouring to form one's own opinions of them instead of taking them at second-hand, of considering what possible changes can be made where changes seem desirable, and making a point of giving effect to one's conclusions in the course of discussion. As a means of cultivating the art of speaking in public, these subjects afford the best opportunities the programme offers, and let none be deterred by a dread of the ridicule sometimes meted out to propaganda suggested here, but be assured of encouragement in their early efforts.

The last, but not the least valuable, records are those of the occasions on which we have been able to meet together, with trade and shop forgotten, and enjoyment and good fellowship the only occupation, when it has been possible to rub shoulders with your fellows, and to judge of them often in a different and better light, and especially to enable many to make friendships and acquaintances. Many a young fellow comes up to this city, with few or no acquaintances, and has to spend some lonely, miserable months; perhaps he is allowed for his leisure time but every other evening, and then for his amusement he has a not too comfortable home or the streets. In other trades, say drapery, where many assistants are employed by the same firm, it is an easy matter for a new comer to find companions, but, as no doubt a goodly number here can testify, with a chemist's assistant the matter is a very difficult one, and this is a bad thing for him, as the habit of going out alone is apt to become less unsatisfactory to him and grow, so that he will after a time be really non-companionable. Any assistant so situated cannot do better than come to our meetings, ordinary and social, where he will be cordially welcomed and made to feel at home by introduction to other members, among whom he will soon feel he can spend at any rate one pleasant evening a week. In this connection, I may say, it will be my endeavour during the coming year of office to see if the Council cannot do something to extend the social side of our programme, and I must express the hope that the Association may soon become strong enough to keep its rooms open more than one, if not every, night in the week, thus completely fulfilling the object for which it originated—and without in any way prejudicing its educational functions.

The foregoing sketches in a very incomplete manner the advantages this Association has offered, and indicates in what way members may look to see them continued. In going into them at such length I must express the hope that I have not made this portion of the address pall upon you. The question naturally occurs at this stage, how much support have we been able to gain? About the answer—some 160 assistants belong, out of perhaps 2000 in London, 500 of whom would be free to attend our meetings—I should like to say a few words. The reasons of the small measure of support are the same that confront every movement in the trade—the apathy and lack of *Esprit de corps*. To endeavour to overcome these, the

Council has sent prospectuses to nearly every chemist's shop in the metropolis, and I ask every member to second this effort by personally canvassing their own acquaintances.

During the last two years I have had the opportunity of seeing a very large number of chemists' assistants, and the more I have seen of them the more have I been impressed that the root of all the disunion in our trade, and therefore largely affecting us, is the insufficient education so many receive, and the systems in pharmacy by which education is obtainable. It is useless to expect an average man, who has for his examinations (certainly not for his training) a short course of six weeks or so, or even a series of such short courses at a school, to be able to take an interest in any matters of pharmaceutical progress, or in any requiring but the most elementary considerations. We cannot get hold of him, and no movement, however beneficial to himself, will be able to claim him. It seems to me the holding of the Society's examinations at intervals of but three months from each other gives a tacit encouragement to this abuse, and difficult as the alteration to holding them twice in the year would make the conduct of these examinations, the consequences would be so material as to compensate for a great additional expenditure of money or trouble. As regards the systems by which education is obtainable, the bulk of the teaching devolves upon the number of schools in this metropolis, where undoubtedly much really good and painstaking coaching is done, and where the short courses I referred to before are arranged, more than any other reason, to cope with the demand for them. But such schools, promoted as commercial enterprises, are wanting in the traditions that make students proud of their own and able to appreciate the others, and to help them to continue afterwards fellowship with the men with whom they worked. These schools have to be in competition for existence with the well-endowed school of the Society, with the usual consequence of competition, that a prejudice arises, in this case against the Society itself, which I am afraid is apt to be shared by the students themselves. This is a matter somewhat outside the limits of this address, but I mention it to let assistants know that this Association possesses the good will of all the principal tutors in the metropolis, and to give publicity to the fact of our independence of any particular school, and because of its indirect effect upon us.

I should like to direct a few remarks to one other class of men, the type of whom points to the tendency of trade, in the formation of store and company pharmacies, and whilst bewailing their probable effect upon his future profits, ridicules the claims of an extended knowledge, or the practice of "your duty to your fellow craftsmen," preached in this room. Gentlemen, unless the people of this country and the medical profession, who hold the power largely to do it, wish to banish all progress in medicine and to establish the state of pharmacy we can read of in some of the American papers, where substitution is freely practised and effect cannot be reliably anticipated, there will be no need for us all to become store chemists, but only those among us, giving careful personal supervision to our duties, conducting our business honourably, and possessing a superior knowledge and skill, will be able to demand anything beyond ordinary commercial profits and compensation. Even now there are signs of an evolution from among us into two conditions, the vendors of patent medicines, toilet requisites, and drugs on the one hand—and the pharmacist, strictly, on the other, and for the man practising as the latter, able to test and standardise, possessing an intimate knowledge of everything passing through his hands, aiding medicine by ensuring certain effect, he may not be able to accumulate

so much gold as the enterprising storekeeper, but he can command greater respect and social recognition, and boast at least of a congenial pursuit.

In conclusion, gentlemen, I must appeal earnestly for hearty support during the coming session. The Council has, even thus early, sustained the loss of several of its most prominent members, owing to business calling them from London, and the success of this session will depend entirely upon the energy displayed by the rank and file of members. On that account, as well as because the benefit received from this Association stands in direct ratio to the assistance each member gives, I ask your regular attendance at our meetings and participation in our work. The programme for the first half-session you will all have received. There is nothing in it to single out for especial mention, as every item possesses distinct interest. On the evening devoted to short papers I hope we shall receive some useful notes, and I ask, on behalf of the secretaries, any who may come upon some little difficulty they are unable themselves to work out, to hand it to the secretary, who will be pleased to find someone willing to do so. And now, gentlemen, it only remains for me to thank you for listening in such a kind way to much that must have been tedious.

At the conclusion of the address, Mr. H. H. Robins rose to propose that a very hearty vote of thanks be accorded Mr. Jones. This was voted by Mr. Gane, and being put to the meeting was carried with acclamation. The proceedings were then adjourned.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The tenth session of the Sheffield School of Pharmacy, conducted under the auspices of the above Society, was inaugurated on Thursday, October 11, when the presentation of prizes to the successful students of the past session was followed by the reading of the following

INTRODUCTORY SESSIONAL ADDRESS.

BY CHARLES B. ALLEN,

Member of Council of the Pharmaceutical Society.

I have to thank you for the honour you have done me by your invitation to share in the social pleasures which mark the commencement of a new session, but I am somewhat concerned for the reputation of my friend and colleague, Mr. Newsholme, whose kindly good-fellowship can alone justify his temerity in submitting my name to you as that of a fit and proper person to deliver an address.

I have always thought that the first reflection which must arise in the mind of any person who has undertaken a duty of this description must surely be a devout wish that some other than himself had been chosen to do it; and in yielding to your desire, I have come to you with a foreboding that it would have been better for you if such had been the case to day.

Yet if by virtue of twenty-eight years happily passed in the practice of pharmacy I may be able to give some slight encouragement, or present some fresh incentive for work, to those who are younger than myself, then indeed my coming amongst you may not altogether be purposeless or ineffectual. For some reasons too

this opportunity gives me great pleasure, principally because as a pharmacist, carrying on my vocation in suburban London—where all questions relating to pharmaceutical education are easily delegated to the central authorities—I am able to express my admiration for the public spirit and strong untiring effort which leads to the foundation, and what is far more important, continually supports a local centre of education, such as is so well exemplified by the Sheffield School of Pharmacy. No words of mine can either exaggerate or enhance the value of this and kindred institutions in the provinces to those students who from the first days of their apprenticeship avail themselves to the full of the advantages they offer. I can assure every student—whether he is entering the classes now for the first time, or progressing through former tuition to more advanced work—that if he carefully follows the plan which the experience of his teachers here will suggest for him, his chances of ultimate success are at least equal to those of any of his co-workers in the kingdom. If I were to contrast the advantages of youths in provincial towns, who have access to classes, with those which are enjoyed by an apprentice in London, I could not readily admit that the latter is the more privileged.

The classes which are held at the School of Pharmacy in Bloomsbury Square are of necessity advanced beyond the capacity of a lad at the age upon which he usually enters upon his apprenticeship. Therefore, a youth who would properly avail himself of the instruction given must have assimilated a good deal of elementary knowledge before he could hope to commence his complete curriculum with any credit to himself or satisfaction to his teachers. But by taking up one subject at a time, and so proceeding through the whole period of his pupilage, he may be justified in the hope that he will have prepared himself to receive and understand the final course of instruction, just as you yourselves will expect to do after having given serious attention to the classes held here during this and subsequent sessions. Then if perchance you should meet—as I earnestly trust you may aspire to do—in honourable competition for the valuable prizes which are offered by the Council of the Pharmaceutical Society, I feel sure you would willingly acknowledge that the advantages on the one side are no greater than those upon the other.

The mention of prizes leads me to a subject of very much importance to all pharmaceutical students. I am inclined to think that sufficient attention has not been paid to certain particulars concerning some very substantial prizes which are specially worth your attention, because they are intended to be well within the range of study during apprenticeship. One of the first things which I should endeavour to impress upon a youth at the outset of his career would be that he should read carefully all those portions of the Calendar of the Pharmaceutical Society which touch upon the subjects of prizes and examinations. He cannot but find it profoundly interesting and instructive. I regret very much that there are many young men who, although they have adopted pharmacy as their vocation, persistently neglect to take a full and com-

prehensive view of all that lies before them, and who even pass the whole period of their apprenticeship in happy ignorance of some of the things which should be realised long before they have gone so far upon the road to discouragement and inevitable failure. A few hours' careful perusal of the Calendar will be sufficient to give any lad a clear insight into the whole plan of study which lies before him and must be accomplished before he can gain his qualification, whilst a contemplation of the list of prize winners should prompt him to use his utmost endeavours to attain similar distinction. In this self-same volume he will find a number of facts which will convince him that the Pharmaceutical Society of Great Britain exercises even a paternal interest in him throughout his educational career, and that a brotherhood, consisting of its members, spreads over the whole surface of the globe. I can assure him, from the warmest recollections of my own experience, that he will thus gain strength, reliance, and increased knowledge by association with the Pharmaceutical Society from the moment when, by reason of his passing the "First" examination, it has become possible for him to do so.

It occurred to me that it might be interesting to glance for a moment at the figures which show what proportion of the students who pass the First examination give in their adhesion to the Pharmaceutical Society, either from a conviction upon their part that it is a good thing to do, or from the desire of their parents or guardians that they should thus early be associated with the parent Society. For this purpose I have made a tabular statement, showing the number of students year by year during the last ten years who have passed the First examination, and the number of similar rank who have joined the Society in the same time. You will notice that of the total number who have passed their Preliminary, a little less than half have joined the Society. Of course, it must not be assumed that the students who have joined in any one year are those who have passed in that year, but as one year overlaps another, by taking ten years a very good illustration of what the proportion really is can be readily shown.

Number of those who passed the Preliminary Examination.

1884	'85	'86	'87	'88	'89	'90	'91	'92	'93	Total
612	690	632	720	733	659	617	700	638	739	6740

Number of those who have joined the Society.

1884	'85	'86	'87	'88	'89	'90	'91	'92	'93	Total
355	390	344	320	341	266	274	381	279	333	3283

It is satisfactory to find that so many of our young men have thus recruited the ranks of the Pharmaceutical Society at a time when the prestige of the body corporate, through the continual advancement of its educational work is of the utmost importance to them, and will powerfully influence them in their

work as individuals. I venture to believe that just in proportion as they may act worthily for their Society, so will they be eager to announce the value which this early attachment had for them. I should not have troubled you with these details and figures, but for the reason of inviting your attention to a subject which presses upon you more closely, and in which I also feel some concern. Perhaps, because my name can be found in the list of unsuccessful candidates, I have always felt a keen interest in the competition for the Jacob Bell Memorial Scholarships. When one considers the number of students who are eligible to compete for these, side by side with the actual value of the scholarships to their fortunate possessors—as well as the universal admission that of all students, he of the genus *Pharmaceutic* is the most hard up—I cannot find words to express my astonishment that during the last decade the numbers competing for these two scholarships have averaged just about twenty-seven per year. To be a "Bell Scholar" should be the happiest dream of the youthful pharmacist, and the attainment of this distinction for a time, at least, his highest and most constant ambition. I am unable to believe that it is actually realised by the bulk of young men in England, Scotland, and Wales, that two prizes worth from £75 to £80 each are contended for annually by a fraction only of those who must obviously be eligible to do so. In the year 1884, at the Inaugural Meeting of the School of Pharmacy in London, Mr. G. S. Taylor, for himself, and his co-examiner Dr. Thresh, called attention to the fact that the number of candidates for the Jacob Bell Memorial Scholarships had again fallen off, there being in that year only twenty, whilst in 1883 there were twenty-five, a number that was so much in advance of previous years that a hope was then expressed that the value of these scholarships was becoming more widely recognised. Mr. Taylor also said that upon "more than one occasion he had had to express his regret that so few young pharmacists can be found to compete for this prize, but he hoped to see a larger competition in future years." By tabulating the number of competitors for the last ten years we are able to see to what extent this hope has been realised.

Number of Competitors for the "Bell Scholarships."

1885	'86	'87	'88	'89	'90	'91	'92	'93	'94	Total.	Average about
82	30	23	26	31	25	23	27	33	22	271	27

It should be noted that from 1888 to 1891 there was included in the above competition a third scholarship of the value of £20, which was founded in honour of Professor Redwood, and bore his name. This scholarship was originally submitted for competition under exactly similar conditions to the Bell Scholarships, practically forming a third prize attainable by students of the Society; but whilst the professor was yet alive, with his sanction and cordial concurrence, it was considered expedient to diverge from the original purpose and convert this scholarship into an award for more advanced students working in the Pharmaceutical Society's Research Laboratory.

This conversion was undoubtedly rendered very much easier by the knowledge that so far as the junior students were concerned, the offer of an additional scholarship had awakened no enthusiasm and attracted no new competitors, and the opportunity thus held out to them was therefore permanently withdrawn. In reiterating and accentuating the regret which was expressed by Mr. Taylor ten years ago, I would beseech every pharmaceutical apprentice in Sheffield, and through them every apprentice in Great Britain, to read and consider the regulations pertaining to these scholarships, with a view to augmenting the number of competitors. The scholarships are founded for them as a class, there is no entrance fee, and the examinations are held annually in July at the forty-two centres at which the Preliminary examinations are conducted and when one reflects that an average of five students from each centre, which is surely no unreasonable number to expect, would bring the total over 200, the average for ten years (of twenty-seven) appears almost ridiculous.

If, by an increased competition, the list of unsuccessful candidates should be augmented tenfold, you will, by your earnest endeavours to attain this distinction, as well as by the course of study it has led you to pursue, have come so easily into the possession of your qualification, that in the retrospect of your student life you will look with pleasure and gratitude upon the contest which, whilst yet on the threshold of your pharmaceutical career, formed the first incentive to adopt a definite line of study. The Manchester Pharmaceutical Association Scholarship affords another marked illustration of an indifference which is scarcely credible. To a limited class, comprehending apprentices who have been engaged for not less than three years in a pharmacy in Lancashire, Cheshire, or the High Peak Parliamentary Division of Derbyshire, an annual scholarship of about £30 has been offered, with the result that for the last three years, through the absence of candidates, no competition has taken place, and the scholarship has for the time drifted into other channels. I confess myself quite unable to explain, by any process of reasoning, how this is to be accounted for, especially when it is noted that the Manchester Scholar, if he so elects, may have the option of carrying on his studies in any provincial school of pharmacy approved by the Council of the Society, whereas the Bell Scholarships are tenable only in London. This should be an important difference to some provincial students, and if the scope of the Manchester scholarship could be extended so as to apply to the provinces without limitation, I should expect there would be an immediate change from the present unsatisfactory state of affairs. I must not lead you to suppose that I have any authority for approaching this question, it merely presents itself in the line of thought along which I am wandering; but believing as I do, that the best results to pharmacy are gained by setting its apprentices to work from the very beginning, I am extremely anxious that this additional incentive may not be lost to them as the Redwood Scholarship has been. I venture to hope

that, if there is any real desire upon the part of provincial students outside the limits of the present area to become eligible for the Manchester Scholarship, and if that desire could be expressed for them officially, the generous donor, impressed with the failure of his design to benefit a limited district, would throw the scholarship open, under certain conditions, to all apprentices in the provinces, and by so doing provide a prize of such value as to ensure a yearly contest amongst the students of provincial schools, which could scarcely fail to result in much permanent good to a greater number than it ever can do under its present restriction. Those students who are located in large manufacturing towns cannot have the facilities or the collection of plants which are afforded to those in purely country districts, but when there is a love for the subject, the disadvantages of the locality rapidly yield to the enthusiasm of the collector. If engaged actively in business, his opportunities are all too few, yet he will seize upon every one of them, and early in the morning, or late on summer nights he will wander full many a mile from home in search of specimens to add to his ever-growing store. To such a one the Pharmaceutical Society's Herbarium prize naturally commends itself, but as the difficulties of collection and the time required for preparation and mounting somewhat seriously tax the resources of the pharmaceutical student, it is not remarkable that the competition for this prize has always been limited. Considered as an alternative to the chances of gaining a scholarship, the formation of herbaria gives healthy exercise and pleasant, instructive occupation to such apprentices as elect to work in that direction, and if the conditions laid down in the regulations have been followed, there should be no hesitation in submitting the collections for assessment by the Professor of Botany, who would gladly devote the necessary time to the examination of a far larger number of collections than those at present sent in.

At the risk of proving wearisome I have endeavoured to represent, from my point of view, the sense of obligation which should pervade the student's mind when he regards the wider range of prizes which are open to him through his association with the Pharmaceutical Society. I am fully conscious that all the information I have given you could be quite as well gleaned by yourselves in your own quiet hours, but I have assumed it to be just possible that the presentation of these matters in a concrete form may be more strongly persuasive, and if I can be successful in inducing even one from amongst your number to aim higher, to go straight for the bigger game, and at the same time have demonstrated that it is worth going for, I need not then apologise for the dullness of my theme. I do not pretend to possess any capacity for directing you in ways by which your study can be made easier, so that whether you resolve to measure your ability by competition with your fellows for open scholarships, or whether you confine your attention to the prizes which are offered abundantly in this School, you must be prepared for right-down hard work. Your teachers are devoted and enthusiastic, and in their several subjects have signi-

fied their willingness to assist to the utmost extent of their power, and your acceptance of their instruction, with care and diligence, will form their best reward. Never hesitate to consult them in your difficulties, and be guided and directed by their experience towards the goal you have in view. I believe in the exhibition of a definite object held always before you, whilst to strengthen your resolution and make more sure of your aim it should lie directly in your way, and not too far off. Some young men think the qualifying examination is quite enough, consoling themselves with the knowledge that two, three, or four years, as the case may be, must elapse before they are old enough to present themselves. They are loud in announcing their intention of having "a shot at it soon," though they are rarely seen with the necessary gun in their hands; many of these, by the bye, eventually declare the Board of Examiners to be composed of extremely crotchety individuals, and, according to their own accounts, are referred to their studies through all sorts of accidental circumstances. I do not agree with their views. Rather would I commend to you the periodic examination, a constant revision of your work, regular entrance for your class prizes, the attainment here and there of a science certificate, or an occasional exploration into the mysteries of the "Student's Corner." These, and others like them, are the stepping stones by which you will ford the stream of knowledge. Opportunities, unknown or unrealised a few short years ago, are now thickly scattered round you. Accept them, ere the time presses and life becomes one long round of labour in the struggle for existence; define your object clearly, and work honestly and systematically towards its achievement.

Even now the time at your disposal is more or less limited, but by devoting one or two hours per day to systematic study it is astonishing how much may be accomplished. Tabulate your subjects, and allot a specific time to each, so as to be able to place every day's work in a conspicuous position before you. In reading without some such arrangement you are not unlikely to give too much time to one subject, and neglect others which ought perhaps to claim a greater amount of attention. If, by unforeseen circumstances, you lose your time and miss the appointed lesson on one day, do all you can to make it up the next; let nothing interfere with the regularity of your work. Two or three years passed in this way effectually lays the "Bogey" of Bloomsbury Square, and he will never trouble you again! Text books have so multiplied in this age, and there are so many short cuts to all sorts of sciences, that there is some fear of a student forgetting how to compile a note book! The young pharmacist at least should not lose this art, nor ought he to be satisfied with merely copying the notes from his lectures, or following on the exact lines which others have laid down. He should cultivate a faculty for digesting his matter by a process of his own, and neatly condense his work into the smallest possible compass, illustrating by diagrams and figures the salient points which will bear that kind of treatment. The student who is neat and methodical in his notes

is laying a foundation upon which will be built a neatness and method, a love of order, and an attention to detail, which are chief amongst the essential characteristics of him who best succeeds in pharmacy. Upon the qualifying examination *per se* it seems almost unnecessary to dilate, no young man who utilises the days of his pupilage in anything like the way which I have tried to indicate need enter the examination room with any feeling of apprehension, for he will be the possessor of an amount of information which has gone beyond the standard required of him there, and he will experience but little difficulty in convincing his examiners that such is the case. The examiners themselves derive no pleasure from the rejection of a candidate, nor do they lightly regard the responsibility of so doing. Their work is rendered difficult and their duties laborious by the large number of candidates who are continually presenting themselves from a sense of compulsion rather than volition; who, after the smallest possible amount of preparation, enter the examination room just for the sake of seeing what the thing is like. The practical examination of the first day has, however, now become so effective through the longer period which is devoted to dispensing and practical chemistry, that it is really difficult for candidates of this class to succeed in getting through this ordeal without declaring their obvious incompetency. The results are sometimes so startling that better things might have been expected from a novice in his first attempts at compounding, which would be amusing if they were not also painful. Often enough the men thus demonstrate for themselves the utter impossibility of proceeding further, and signify their wish to retire on account of the wretched failure which lies before them, in an often repeated effort to compound a comparatively simple formula. In their dealings with individuals it is idle to suppose that the examiners do not possess a profound knowledge of human nature, coupled with an average amount of common-sense; they can quite easily distinguish between a purely nervous candidate and the assumption of nervousness to hide incapacity. But as there are some students who cannot avoid a feeling of tremor whenever they are face to face with an examiner, I would just like to assure the nervous man—if any such be here—that I have myself witnessed an amount of consideration and kindness to a candidate who had manifestly broken down through sheer nervousness, and who, I need hardly say, was an absolute stranger to the examiner, which probably will have the effect of altering his impression of examiners for the remainder of his life.

Through your familiarity with the business of pharmacy you must soon realise that you have adopted a vocation of manifold responsibilities, inasmuch as you are to fit yourselves for becoming the intermediaries in an Act of Parliament, which gives you certain privileges on the one hand and provides for the safety of the public upon the other. I am aware that the privileges are considered by some to be unimportant and barely worth the trouble of attainment, but such as they are you must be prepared to accept them

loyally until the time is ripe for better things. If you are firm in your adhesion to pharmacy, let your appreciation of it lead you to a high estimation of its possibilities, remembering that if you disparage your vocation, those who are brought into contact with you will do the same. Give yourselves up to the mastery of every detail, however petty, however paltry; they are all worth acquiring, there is so much to do that it will easily absorb all your working hours. Cultivate your powers of observation, and seek an explanation for everything which appears to need it; do not be content with the mere knowledge that it exists, for every cause there must be a reason. Your seniors who have been engaged in pharmacy for many years can tell you, if you seek them, countless things which are worth knowing, which you will value in later years perhaps better than you do now. Above all things pay heed to their counsel, and respect their experiences, until you are able to discover better ways for yourselves. If you are inclined to think them faddists, remember that their fads have endured the test of time. "Knowledge comes, but wisdom lingers," is true to them and true to you; you may be on the high road to the one, but you must be content to wait for the other.

If the miscellaneous nature of the trade you are engaged in necessitates the handling of many things which are unconnected with pharmacy, if your work is rough and sometimes arduous, you are none the worse for that, for many of the masters in your craft have trod the self-same paths; and providing you do your duty in all things with cheery and determined purpose to excel in each, you will assuredly find in due season, out of your own experience, that the evolution of the pharmaceutical chemist, by easy gradations from the country apprentice, is not only possible, but has become an accomplished fact.

To you who would go further still, the chart lies open, and all its ways are plainly marked. You may obtain admission and opportunities of continued labour in the Research Laboratory, the Pharmaceutical Society through its Council having thus made it possible for you to become a worker for the common weal. Whether your enthusiasm ultimately devotes you to the practice of pharmacy, or whether it leads you out into the wider fields of science, you will still remain a true child of your *Alma Mater*, reflecting your successes upon the teachers of your earlier days and ever ready to acknowledge the gratitude you owe to them. Give heed to them now, the road will widen and you know not whither it leads—follow trustfully until you find it pointing clearly to that great opportunity which so mysteriously shapes its ways, that once at least in life it comes to all who work and wait.

LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The annual meeting of this Society was held at the University College, Liverpool, on Thursday, October 4, the president, Mr. Frank Walker, in the chair. The following officers were elected for the ensuing session: President, Mr. R. Mitchell, Old Swan; Vice-Presidents, Mr. R. C. Cowley, Ph.C., and Mr. J. Jones, Treasurer, Mr. J. G. Jackson; Secretary, Mr. George M. M'Loughlin, 56, Hanover Street; and nine other members of committee.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

SALE OF NUX VOMICA BY AN UNREGISTERED PERSON.

The case of the Pharmaceutical Society of Great Britain v. White came before the Registrar of the Croydon County Court on Tuesday last. It was brought by the Society to recover a penalty of £5 from Mr. White for having sold a poison, he not being a qualified person within the provisions of the Pharmacy Act, 1868.

The defendant carries on the business of a general dealer at 17, High Street, Merton, and the case arose out of the sale by his daughter of a packet of "Woolf's Vermin Poison," which contains nux vomica.

Mr. Grey, barrister, appeared on behalf of the Society.

The defendant appeared in person, and submitted to judgment. He asked for time within which to pay the penalty, and said that he was ignorant of the fact of his daughter having sold the poison.

The Registrar pointed out that the defendant had been keeping open shop for the retailing of poison, and knew that he had the article in his shop.

Mr. Grey said the packet which was sold actually had the word "poison" on it in large letters in two places.

The Registrar gave judgment forthwith for the penalty and costs, but stayed execution on the terms of the defendant paying £1 a month.

ILLEGAL SALE OF STRYCHNINE.

On October 8, at Wandsworth County Court, the case of the Pharmaceutical Society of Great Britain v. Hollis and Co. came on for hearing. This was a summons taken out by the Society under the Pharmacy Act of 1868 to recover a penalty from the defendants for selling a poison, they not being qualified persons within the meaning of the Act. Messrs. Hollis and Co. are oilmen, carrying on business at 513, Battersea Park Road, and on August 7 last they sold a packet of Thorpe's rat and mouse poison, which, it was alleged, contained strychnine, one of the poisons scheduled under the Act. The defendants had paid the penalty into court prior to the hearing, but not having done so within the prescribed time, application was made to the Registrar of the Wandsworth County Court on behalf of the Society for extra costs. The learned Registrar acceded to the application.

SALE OF POWELL'S BALSAM BY AN UNREGISTERED PERSON.

At the Wandsworth County Court, on Wednesday, the 10th inst., before his Honour Judge Lushington, the Pharmaceutical Society sued Robert Briggs, carrying on business as "Briggs and Co.," at 65, Battersea Park Road, S.W., for two penalties of £5 each, for selling poisons contrary to the provisions of section 15 of the Pharmacy Act, 1868.

Mr. Grey (instructed by Messrs. Flux, Thompson and Flux) appeared for the Pharmaceutical Society; the defendant conducted his own case.

Mr. Grey, in opening the case, said the defendant keeps a drug store at 65, Battersea Park Road, and by his labels holds himself out to be a chemist. The action was brought to recover two penalties in respect of the sale of poison contrary to the provisions of the Pharmacy Act. The article sold in this case was "Powell's balsam of aniseed," which, it would be proved contains morphine, a poison mentioned in the schedule to the Act. The Act is the 31 and 32 Vic., and its object, as laid down by Mr. Justice Hawkins,

is to prevent the danger likely to arise to the public from unqualified persons selling the various poisons mentioned in the schedule to the Act.

The Judge (to the defendant): What is your defence?

Mr. Briggs: I do not know, your Honour. I am brought here as regards "Powell's balsam of aniseed." I am not the proprietor of "Powell's balsam of aniseed." It is a "patent" medicine.

The Judge: Did you sell it, or have it for sale?

Mr. Briggs: I do not know. Who is the buyer?

The Judge: We shall hear that. You evidently do not know what your defence is.

Mr. Grey: Section 2 says: "The several articles named or described in the schedule (A) shall be deemed to be poisons within the meaning of this Act, and the Council of the Pharmaceutical Society of Great Britain may from time to time, by resolution, declare that any article in such resolution named ought to be deemed a poison."

Mr. Briggs: Excuse me, that is section 2; but does that refer to "patent" medicines?

The Judge: You will have an opportunity later.

Mr. Grey: If your Honour refers to the schedule you will find that by a resolution of December 1, 1869, preparations of morphine were added to the schedule.

The Judge: A preparation of morphine is a poison under the Act?

Mr. Grey: Yes. Then section 13 says: "The absence of the name of any person from the printed register shall be evidence, until the contrary shall be made to appear, that such person is not registered according to the provisions of the Pharmacy Act."

The Judge: You do not say, I suppose, that you are registered, do you?

Mr. Briggs: No. I say this is a "patent" medicine.

Mr. Grey: Then section 15 says: "Any person who shall sell or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of chemist," etc., not being duly registered, etc., "shall, for every such offence, be liable to pay a penalty or sum of £5, and the same may be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act for the recovery of penalties under that Act." Then section 16, which I think is the one the defendant has now got his mind upon, says: "Nothing hereinbefore contained shall extend to or interfere with the business," and so on, "nor with the making or dealing in patent medicines." Now "Powell's balsam of aniseed" has been the subject of a good many actions in the last two years, but I need only refer your Honour to the last one. That case (*Pharmaceutical Society v. Armson*) is reported in L. R., 1894, 2 Q. B. Div., p. 720. That case went up to the Court of Appeal. There it was decided, following *Piper's* case, which was decided last year, that the prohibition in section 15 of the Act of 1868, dealing with the sale of poisons by other than registered chemists, is not confined to the sale of poisons in their simple state, but includes also poisons which form part of a compound.

The Judge: Even although it be a "patent" medicine?

Mr. Grey: This is not a "patent" medicine.

The Judge: There is another phase of "patent" medicines different from the legal phase.

Mr. Grey: It is general amongst grocers to include under the title of "patent" medicines, not only those for which Letters Patent have been taken out, but also those which are secret remedies or nostrums. In law a "patent" medicine is only a medicine for which Letters Patent have been taken out. That was decided in *Piper's* case.

The Judge: This (*Armson's*) case deals with the very compound—"Powell's balsam of aniseed."

Mr. Grey: Yes; that case dealt with "Powell's balsam of aniseed," and it was then found to contain morphine to the amount of one-tenth of a grain to the fluid

ounce. I will prove before you to-day that the two bottles in this case each contained one-fifth of a grain to the fluid ounce, or twice as much.

The Judge: I have read the judgments in that case.

Mr. Grey: The defendant in this case was the actual seller of the two bottles.

Mrs. Sarah Partridge, examined by Mr. Grey: Did you on July 27 last go to 65, Battersea Park Road?—Yes.

What was it?—It was a chemist's shop.

What did you ask for?—A bottle of "Powell's balsam of aniseed."

Whom did you ask?—The defendant.

Did he supply you?—Yes.

What did you pay for it?—10½d.

[The witness identified the bottle.]

Was there anything else round the bottle when it was served to you?—Nothing else.

Did you go again in the following month?—On August 3.

What did you ask for then?—A bottle of Powell's balsam of aniseed. I was served by the defendant.

Was the bottle wrapped up in anything besides this?—No; not on either occasion.

The Judge: Were you desired to go and buy these bottles?—Yes.

Who requested you to go and buy them?—A representative of the Pharmaceutical Society.

Mr. Grey: What did you do with these bottles?—I took them home, and kept them under lock and key until I handed them over to Mr. Eastes on October 3.

The Judge: Did you keep them by you two months?—Yes.

Mr. Grey: Were they in the same state then as when you received them?—Yes.

The Judge: Is the name of the defendant on the bottles?—No.

Cross-examined by Mr. Briggs: On what date did you buy it?—On July 27.

What time of the day was it?—About seven o'clock in the evening.

What day was it?—I believe it was on a Friday.

According to the date it appears to be a Saturday?—No.

Was it about a quarter to twelve?—No.

Mr. Grey: Your Honour, I believe, has the bottle there. The lady wrote on it as soon as she got home the actual date when she bought it.

The Judge: The date on the bottle appears to be July 24.

[The witness produced a book showing the date of the purchase to be the 27th.]

Mr. Briggs: Are you employed by anyone? Are you employed by your husband?

The Judge: You may take it that it was the Pharmaceutical Society.

Mr. Briggs: This lady is employed by her husband. The two work together.

The Judge: Very well.

Mr. Ernest John Eastes, examined by Mr. Grey: Are you an analyst, and a Fellow of the Institute of Chemistry?—Yes.

Did you receive on October 3 two bottles from the last witness?—I did.

In what condition were they when you received them?—They were sealed.

Was the medicine stamp on each bottle broken or unbroken?—Unbroken.

Did you analyse the one taken on July 27?—I did.

The Judge: What is it called?—"Powell's balsam of aniseed."

Did it contain any poison?—It contained morphine.

How much?—One-fifth of a grain to the fluid ounce.

Mr. Grey: Did you analyse the bottle bought on August 3?—Yes.

Did you find morphine in that bottle, and to what

extent?—The same extent—one-fifth of a grain to the fluid ounce.

The Judge: What effect would it have if it were administered to a child?—It would be fatal to a young child.

Cross-examined by Mr. Briggs: You say the stamp was unbroken?—It was unbroken.

This being a "patent" medicine, how am I to know the contents of the bottle?—There have been many cases relating to Powell's balsam of aniseed.

The Judge: Perhaps you are bound to know.

Mr. Briggs: If you look you will see that it merely states "Powell's balsam of aniseed."

The Judge: Very possibly you did not know it was poison.

Mr. Briggs: I did not.

Mr. Grey: That is my case. I put in the register.

Mr. Briggs: If I sold this poison it was in ignorance. It is a "patent" medicine, and I have got a patent medicine licence.

The Judge: All that is admitted. Piper's case was not Powell's balsam?

Mr. Grey: No, that was chlorodyne.

The Judge: Is the regular course to impose a penalty of £5?

Mr. Grey: That is the amount fixed by the Act.

The Judge: Is the full penalty exacted in all cases?

Mr. Grey: There is no discretion as to the amount?

The Judge (to the defendant): I do not know whether you know the law, but you are bound to know the law. I should think in your business the law was well understood by this time, because in Armson's case the very same point was decided, and the very same article, "Powell's balsam of aniseed," was dealt with. You call this a "patent" medicine, but you know it is not a patent medicine. There is no patent for it; in fact, we know it is only what is called a proprietary medicine. It may be that you did not know what it is made from, but still that is no answer; it is no protection to the public if you sell poison not knowing it to be poison. You are liable if you sell any poison provided against by the Act. Here you clearly did sell this "Powell's balsam of aniseed," and it is quite clear that it was a preparation of morphine, and contained morphine to the extent of one-fifth of a grain to the fluid ounce. That is a poison which is included in the schedule to the Act. In this case you are liable, and I must impose a penalty of £5 in each case.

Mr. Grey: I ask for costs under scale A. The same defendant was before you as late as April 21, and the same penalty was imposed then, but it seems to have done him no good.

The Judge: I did not know that.

Mr. Briggs: It was not a "patent" medicine then.

Mr. Grey: I ask for the costs under scale A.

The Judge: Yes.

Mr. Briggs: Can I appeal against this?

The Judge: I have nothing to do with that. I may tell you that a case has been decided by the Court of Appeal with reference to this very "Powell's balsam of aniseed" sold under circumstances exactly like this, except that perhaps your case may be somewhat stronger, as the bottles in your case contained a larger quantity of poison.

ILLEGAL SALE OF WEED KILLER.

The case of the Pharmaceutical Society v. Moore also came before his Honour Judge Lushington at the Wandsworth County Court on Wednesday, the 10th inst.

Mr. Grey appeared for the Pharmaceutical Society. The defendant appeared in person.

Mr. Grey said: This is another action for a penalty for the sale of poison, but in rather a different form.

The defendant in this case is a nurseryman, carrying on business at 261, Upper Richmond Road, Putney, and on the 27th of July he sold a can containing a gallon of "Smith's Weed Killer." That gallon of "Smith's Weed Killer" was found to contain as much as 2½ lbs. of arsenic, which, I need hardly say, is enough to kill thousands of people. I will not refer to the Act again, but I merely say that with regard to the sale of arsenic, even if chemists sell it, they have to go through a great number of forms in order to know whom it is sold to, and so on.

The Judge: You need not trouble yourself about that.

Mr. Grey: They have to get the address of the person to whom they sell, etc. In this case the "Smith's Weed Killer" was sold without any questions whatever. Arsenic is the first poison mentioned in the schedule.

Mr. John Partridge, cross-examined by Mr. Grey: Where do you live?—At Brixton.

The Judge: What are you?—I am a commission agent.

I suppose you were directed by the Pharmaceutical Society to make this purchase?—Yes.

Whom did you see?—I saw the defendant.

Mr. Grey: What did you ask for?—A gallon of weed killer.

The Judge: Is that a well-known thing?—Yes.

Mr. Grey: How was that supplied to you?—In a tin.

Was it put into the tin by the defendant?—Yes.

What from?—From a larger tin, containing perhaps six or seven gallons.

What did you pay for it?—2s. 3d.

[Receipt produced and identified.]

What did you do with it? Did you hand it over to Mr. Eastes for analysis on Oct. 3?—Yes.

In whose possession was it until Oct. 3?—In my possession under lock.

Mr. Ernest John Eastes cross-examined by Mr. Grey: Did you receive the can which is before you?—I did.

Did you analyse the contents of that can?—I did.

What did you find it contain?—I found that it contained arsenic.

How much?—Nearly 2½ lbs.

The Judge: How many persons would that poison?—I should think 8,000 at the smallest computation.

The Judge (to the defendant): You do not say you are registered under the Act?

Mr. Moore: No. I will state the facts. Some time ago I had been asked by one of my customers to get this weed killer, and I got it and used it. Being a small gardener it killed all the weeds, but my workmen said it took their work away, and I put it away in a cupboard and did not use it. Mr. Partridge came and said, "Do you keep Smith's Weed Killer," and I said I thought I had some, and searched about and found the can and put a gallon into a can for him. He asked how much it was, and I did not even know the price, but I charged him 2s. 3d. He asked for a memorandum, and I gave him one. Mr. Partridge went away, and in the course of a few weeks I received a letter from a firm of solicitors in London, saying that I had infringed the Act by selling a poison. I was startled, and thought they had made a mistake. Then I received another letter, saying that I had infringed the Act by selling a weed killer containing poison. I knew nothing about the Act, I have never heard there was one, and I do not keep a shop in any way; I simply had this stuff by me. I have had to give up business because there has been nothing doing, and I am now seeking a situation. I sold it as a gardener innocently.

The Judge: How did you get it originally?

Mr. Moore: I got it about five or six years ago on the suggestion of a customer. If I had been told I must not sell it I should not have thought of doing it; I think it is very hard to impose a penalty on me under the circumstances.

The Judge: I understand you to say, Mr. Grey, that the words "shall be liable to pay" imply a duty on the Judge to impose the penalty if it is due? I have no discretion.

Mr. Grey: No, you have no discretion.

The Judge: I suppose your Society has a discretion as to whether they shall enforce it or not?

Mr. Grey: I am not sure of that. The Society is bound to take the proceedings. I should like to call your attention to this fact, that there have been a number of cases of poisoning by weed killers.

The Judge (to the defendant): I am bound to inflict upon you a penalty of £5. As far as I am concerned, I am prepared to accept your statement that you did not know it was a poison, and that you came by it in the way you have stated; but still that will not relieve you from your obligation to the public. It is very necessary for the public that these proceedings should be taken.

Correspondence.

BRAGANTIA WALLICHII.

Sir, With reference to Mr. Hooper's paper on *Bragantia wallichii* (*Pharm. Journ.*, Sept. 22, p. 231, and Dr. Masters' letter on the same subject, *Pharm. Journ.*, Oct. 6, p. 290), I may perhaps be allowed to add a few words towards clearing up the mistake that has surrounded the section of stem received by Dr. Masters from Dr. Cleghorn, at the time the former wrote his paper in the *Journal of the Linnean Society*, vol. xiv., p. 487, which is referred to by Mr. Hooper, who says that the sketch of the section in the *Linnean Journal* shows a very eccentric arrangement of the wood, with irregular zones extending laterally, indicating a plant of a scandent habit, and quite different from the stem of true *Bragantia wallichii*. Dr. Masters' modesty allows him only to say in his communication to the *Pharmaceutical Journal* "that Dr. Solereder has shown that the stem I received under the name of *Bragantia wallichii* cannot belong to that genus, nor even to the *Aristolochiaceae*," but he does not say that in his original description of it in the *Linnean Journal* he pointed out that "the arrangement of the wood is here totally unlike that of *Aristolochia*." He further gives a minute and accurate description of the wood structure which it may be well to reproduce here as further proof of its dissimilarity from any *Aristolochiaceae*, thus: "A transverse section shows a primary cylinder of wood surrounding a pith whose cells are filled with starch grains, and which is begirt by a dense layer of hard, dark-coloured liber, whose cells are completely filled with woody deposit. The wood itself is soft, and consists exclusively of long wood cells, interspersed among which are porous vessels. Outside this primary cylindrical portion are arranged in layers, one over the other, imperfect zones of wood and bark—imperfect in that they appear not wholly to surround the original cylinder but to spring from its sides somewhat as a watch-glass does from a watch. These concentric layers differ also from the original cylinder. In the first place they have, of course, no pith, the wood being applied immediately upon the cortical or liber layer of the zone which they surround. Again the

medullary rays in the primary cylinder are small, and their component cells are only slightly, if at all, thickened by woody deposit in their interior, while in the succeeding layers the medullary rays are thick, dense, hard, and dark brown in colour, being in fact continuous with the bands or zones of liber cells which separate the wood zones." The portion of stem thus described having been presented to the Kew Museum by Dr. Masters, I was led some time since to examine it, and its similarity was so close to that of *Gnetum* that upon comparing it with the wood of that genus no doubt was left as to the *Gnetaceae* being its proper position, and very little doubt indeed that its accurate identity is with *Gnetum scandens*.

Museum, Royal Gardens, Kew. JOHN R. JACKSON.

Sir,—In reference to Dr. Masters' letter last week (p. 290), pointing out that the stem he received from Dr. Cleghorn as *Bragantia wallichii* was subsequently shown by Dr. Solereder to be not an *Aristolochia* at all, it may be interesting to add that I received this morning a postcard from Dr. L. Radlkofer referring me to a paper on *Bragantia wallichii*, by Dr. Solereder, in the 'Bull. Herb. Boiss., II.,' No. 5 (1894) p. 384, in which the latter has proved that the stem in question is that of a species of *Gnetum*. This genus, it will be remembered, was shown by Mr. W. Elborne at the meeting of the Pharmaceutical Conference at Oxford this year, to yield a stem very like that of *Pareira brava*. The resemblance of the supposed *Bragantia* to menispermaceous stems had already been noticed by Dr. Masters. To the naked eye the difference between the transverse section of an *Aristolochia* and a *Gnetum* or a *Pareira brava* is evident in the fact that an *Aristolochia* does not possess conspicuous concentric rings. It is fortunate, therefore, that Mr. Hooper gave an illustration of the drug that he examined. There are, of course, histological differences between the genera *Aristolochia* and the *Gnetum*, which are fully explained in the paper by Dr. Solereder, referred to by Drs. Masters and Radlkofer.

E. M. HOLMES.

Diary of the Week.

SUNDAY, OCTOBER 14.

Chemists' Assistants' Association.

Excursion to Chingford and Epping Forest.

WEDNESDAY, OCTOBER 17.

Western Chemists' Association (of London), at 8.30 p.m.

Annual Meeting at the Westbourne Restaurant.

Royal Microscopical Society, at 8 p.m.

"On the Foraminifera of the Gault of Folkestone," by F. Chapman.

"Notes on the genus *Corethron*," by H. Stofferth.

THURSDAY, OCTOBER 18.

Chemists' Assistants' Association, at 8.30 p.m.

"The Duties of the Pharmaceutical Society as an Educational Body." Discussion to be opened by E. H. Gane.

Midland Pharmaceutical Association, at 8.30 p.m.

Inaugural Meeting at the Midland Hotel. Address by the President, Mr. R. Darton Gibbs.

Glasgow and West of Scotland Pharmaceutical Association.

Address by Dr. D. C. McVail.

FRIDAY, OCTOBER 19.

Quekett Microscopical Club, at 8 p.m.

Ordinary Meeting.

SATURDAY, OCTOBER 13.

Pharmaceutical Football Club.

Practice Match at Wormholt Farm, at 3.15 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Allen, Bennett, Clarke, Coupland, Cracknell, Jackson, Lunan, Marshall, Martin, Miles, Newsholme, Thompson, Warrell, Wright.

Weights and Measures.

BY D. B. DOTT.

The question of introducing the metric system of weights and measures into the Pharmacopœia is now prominently brought forward, and deserves full discussion and consideration. The introduction of the metric system is recommended on two distinct grounds; first, that of its essential superiority to the British code, and secondly, on what may be called the cosmopolitan ground, that because other nations have adopted the system, it is convenient that we should do so also.

It is too much the fashion to speak as if the British system were everything that is bad, and the metric everything that is good. It may readily be admitted that the adoption of the metric in place of the *avoirdupois* system would be an advantage, as it would greatly simplify calculations, yet its introduction would have other drawbacks besides the trouble involved in making the change. I remember Sir Frederick Bramwell, from an engineer's point of view, objecting to the decimal system because it did not conveniently lend itself to sub-division by halves. No doubt there is something in that objection. By the unfortunate fad of fixing the size of the metre from a proportion of the earth's meridian, a standard has been got which is inconveniently long. As Professor Tait says:—"Any cloth merchant will tell you that." Similarly, the kilogramme and litre are inconveniently large. To many minds, also, the nomenclature, however systematic, is clumsy and long-winded. All our English names for weights and measures are short, mostly monosyllabic, unlike "cubic centimetre," while the very similarity of such names as decigramme and dekagramme suggests confusion. It also seems worthy of note, that it is easier for a man to bear in mind such a quantity as 3 lb. 13 ozs. than, say, 1725 grammes (see U.S. Pharmacopœia). But the chief weakness of the metric system is just in the same fact in which consists its strength, viz., that it is a decimal system, dependent wholly for its accuracy on the position of a point. It is, indeed, not a system of different denominations, as grains, drachms, ounces, but a system of one denomination multiplied or divided by the placing of a point. I am aware it has been denied that there is any more liability to error in the one system than the other. That is a matter of opinion. From a pretty constant experience of both methods for twenty years, I think there is a decided balance of accuracy in favour of the British system. A man is more apt to write .01 gramme instead of .001 gramme, than he is to write gr. j. instead of gr. $\frac{1}{2}$, and when the writing is preceded by a calculation there is even greater liability of the decimal point going wrong. I am, therefore, of opinion that for prescribing and dispensing the British system of weights and measures is to be preferred, while for analytical work the metric is more convenient.

The British system, as we now have it, has one serious defect, which is noted in the Pharmacopœia itself. "It must be admitted that the absence in the present system of any denomination of weight between the grain and the *avoirdupois* ounce of 437.5 grains, and the fact that the ounce is not a simple multiple of the grain are grave defects." It might be added that the differ-

ence in volume between the minim and grain measure is an anomaly and absurdity. The old troy weight, or that modification of it which used to be called apothecaries', is a system complete and perfect in itself. Who it was that conceived the idea of mixing up two different systems and so producing confusion I do not know, but it was not a happy thought. Surely the trifling trouble of keeping two sets of weights, one for dispensing purposes and one for ordinary trade transactions, would be preferable to working with a hybrid mixture which is no system at all.

It is proposed that in the new pharmacopœia the proportions of ingredients should be given in the metric as well as in the British system. Of course, the present method of stating "parts" and "fluid parts" is practically the same thing. In the volumetric tests it would be scarcely worth while to refer both to grain measures and cubic centimetres. It would probably be sufficient to give only the metric equivalents. In the present pharmacopœia the strength of a preparation is sometimes indicated by percentage, sometimes by grains in a fluid ounce, or some other amount. It would be distinctly better to invariably give the percentage, or in the case of liquids it might be grammes in 100 C.c. For the convenience of prescribers it is quite appropriate to state in the account of a preparation the number of grains of the active ingredient in the fluid ounce; but under "characters and tests" the strength should be systematically stated by percentage.

Reserve Materials of Plants.*

The metabolism of plants consists of two essentially different processes, the simple bodies originally absorbed being worked up, at the cost of a great expenditure of energy, into bodies such as animals live on, and the actual nutrition of the organism commencing subsequently to this formation of elaborated materials. The tendency of plants is to accumulate stores of material on which their protoplasm may subsist, and from which their new substance may be constructed, and a great part of their metabolism is directed towards the accumulation of these "reserve materials" in their tissues.

Besides the reserve materials laid up in seeds, tubers, and other reservoirs, there is a circulating store, flowing sometimes in one direction and sometimes in another, which consists of the same materials as the quiescent reserves, but fitted for the immediate use of the living substance. Whilst the carbohydrates of the reservoirs are mainly starch or inulin, those of the circulating sap consist of sugar or vegetable acids derived therefrom. Again, the nitrogenous bodies of the seed are usually either definite grains or collections of amorphous proteids, but those of the sap are mainly diffusible proteids or amide bodies largely derived from them. In seeds, tubers, bulbs, corms, fleshy roots, and stems, there is found an almost permanent deposit of food material; whereas in medullary rays and cells of vascular tissue, in sieve tubes and laticiferous vessels, the material is laid down for only brief periods, ready for an

* Abstract of a paper by Professor J. Reynolds Green, M.A., Sc.D., in *Science Progress* for October.

almost immediate demand on the part of living cells. The temporary stores are as a rule of a more easily transformed character than the more permanent ones.

Nitrogenous reserve materials, wherever found, are largely met with in the shape of some form of proteid matter. Numerous vegetable proteids with very curious reactions have been shown by recent investigations to be of the same nature and similar composition to proteids of the animal body. Other nitrogenous compounds, chiefly confined to the fluid sap in the living cells, are grouped together as amides. They include asparagin, glutamin, leucin, tyrosin, and other crystalline bodies. Some amount of nitrogenous reserve materials may also be found in some of the glucosides, such as amygdalin and myrosin.

Non-nitrogenous reserve material is mainly carbohydrate, such as starch and its derivatives, cellulose, sugars, inulin, and glycogen. Next in importance come the glucosides, whilst fats and oils are of common occurrence in many fruits and seeds. Then comes tannin, phloroglucin, and alkaloidal matters, which are of uncertain nutritive value, and, lastly, small accumulations of mineral matter often occur associated with proteid deposits.

The proteid substances are naturally of primary importance. They occur in large quantities in many seeds, are easily isolated, and are generally spoken of as aleurone grains. Pfeffer, in 1872, attributed their first formation to the influence of the mineral constituent—calcium oxalate or calcium and magnesium phosphate—with which they are associated. More recently Randle has argued that the process is one of true secretion, and not a mere mechanical precipitation. Belzung, in turn, opposes the secretion theory and favours Pfeffer's view. The hypothesis of protoplasmic secretion, however, has probably most to be said in its favour. With regard to the composition of these proteids, Weyl gave the names of vegetable myrosin and vegetable vitellin respectively to two globulins, coagulating at different temperatures (55° to 60°, and 73°), which he extracted from various seeds. Vines confirmed Weyl's results in the main as to the composition of aleurone grains, and discovered in some seeds another proteid—an albuminate or derived albumin. The crystalloids in the cells of potato tubers belong to Weyl's vegetable vitellin, and Zöller has also found in the potato some vegetable myrosin. The occurrence of proteid in similar forms has also been indicated by several other workers.

The latex of plants has been proved on investigation to contain various proteids. Thus, Martin has found two well-defined albumoses, a globulin, and an albumin, in the latex of *Carica papaya*; and Green has shown that the latex of *Parameria glandulifera* contains a peptone-like body, capable of dialysis and convertible into peptone by the action of pepsin. A similar substance occurs in *Brosimum galactodendron*, the "cow-tree" of South America. The cortex of the stem of the Manihot contains a globulin, the succulent tissue of the lettuce an albumose, and the underground parts of asparagus an albumin. The proteids found in latex and various succulent tissues are not in the form of aleurone grains, however, being either in solution or packed away in an amorphous form in the meshes of the protoplasm. True peptone

occurs in the germinating seeds of leguminous plants and cereals, being probably a stage in the transformation of the resting reserve material to amide bodies, which are transported from the food reservoirs to the seats of active growth.

The reserve proteids proper, then, are to be regarded as non-diffusible, granular or amorphous bodies, soluble with difficulty, and almost without power of dialysis. There are several albumoses, two groups of globulins, and albumins, whilst in regions where storage is not so evident are found members of the peptone group, which give characteristic reactions, and are capable of dialysis.

Practical Systematic Botany.

(Concluded from page 293.)

Having determined the class, the student may proceed to find out the sub-class. If the plant is evidently adicotyledon, he must ascertain whether there is only one row of leaves in the flowers (Apetalæ), two rows with the inner row united together (Monopetalæ), or two rows, the inner row consisting of separate pieces (Polypetalæ). If the last, he must further determine whether those of the inner row (petals) are attached to the thalamus (Thalamifloræ), or to the calyx (Calycifloræ). If the plant apparently belongs to the Apetalæ, he must make sure that it is not an anomalous plant of the other sections, such as the clematis, in which there is only one row of leaves in the flower, and they are coloured. In this plant the stamens are numerous, and numerous carpels are present. In Apetalæ, if numerous stamens are present the carpels are absent. As the Apetalæ are not a natural section, although a convenient one, help should be obtained from a botanist when a flower possesses only a single row of leaves, and the student fails to find it mentioned in the appendix of exceptions in the 'Botanical Note-book.' If the plant proves to be a monocotyledon, the student's task is much easier. The flower will belong to one of three sections. In the one, the parts of the flower are either in a multiple of three, as in the lily (Petaloidæ), or the coloured parts are absent, as in the grasses (Glumiferæ), the stamens and carpels being enclosed between two small leaves (bracts), or the flowers are arranged densely together without either calyx or corolla, and the whole enclosed in a large membranous leaf (spathe), as in the Arum (Spadicifloræ). Having determined to which of the above groups the plant belongs, he may then proceed to consult a chart of the principal natural orders. If he commences with ordinary medicinal plants, these will certainly come under some one of the twenty-eight orders of which a knowledge is required by pharmacists. If these are not obtainable, he may have to consult the second chart in the 'Botanical Note-book,' but this should not be done until it is evident that the plant does not belong to one of the orders in the first chart. Unless the plant agrees with all the characters given under the natural order, it may be decided that it does not belong to it, and the student may pass on to the next natural order, unless there is strong reason for supposing that the plant is an exceptional one. For instance, the marsh marigold (*Caltha*) has a family likeness to the buttercup,

having numerous hypogynous stamens and separate carpels, but it has only one row of leaves in the flower. Strictly speaking, therefore, it would be put in the Apetales. In a difficulty of this kind, reference should be made to the appendix to the chart, where these anomalous plants are mentioned.

Having settled the natural order, if it is desired to identify the species, the best plan is to write out a description of the plant on a schedule and then to compare it with the description of the plants given in a Flora, first comparing it with the characters given under the genus, then under those given for the sections of the genus, and lastly with those given under the species. Although the process seems a lengthy one, it is the quickest in the end. If the plant be not examined in this methodical and business-like manner, as much as an hour may be wasted over a single plant, and the student even then left in doubt whether or not he has rightly named the plant. To determine the name of a plant easily it is absolutely necessary to gather the whole of the plant if possible, and if not, the fruit and root leaves should never be neglected, as these in certain cases are distinctive. Thus, in the Umbelliferae and Cyperaceae it is almost impossible to name a plant in which the fruit is not fully developed, and time is only wasted in making the attempt. It will be observed that, for the purposes of the examinations, the specific name is only required in the case of a comparatively small number of medicinal plants, and that it is much more important to the student to be able to refer a plant to its natural order and genus. It is too commonly supposed that to know the names of plants is to be a botanist, which is very far from being the case.

For the apprentice resident in a city, the best method of forming a good idea of a natural order will be to go to a botanic garden and ask for a few of the typical plants of any of the natural orders required, and to compare them with each other. Thus, taking for instance the Ranunculaceae, let him observe the few characteristic features of the order (reduced to a minimum of two in the chart No. 1 in the 'Botanical Note-book'), and examine as far as possible the plants diverging from the type. Thus, supposing the buttercup to be the type of the Ranunculaceae, having numerous hypogynous stamens and separate carpels as the leading features, let him compare with it the aconite, in which the petals and sepals are irregular; with the hepatica, in which the apparent calyx is a three-leaved involucre; with the anemone, in which the calyx is coloured, the involucre removed lower down the stem, and the corolla absent; with the delphinium, in which the calyx and corolla are spurred; with the hellebore, in which the petals are tubular and the calyx coloured; with the peony, in which the calyx is persistent; and with the clematis, in which the leaves are opposite. In all these he will find the leading characters present, viz., numerous hypogynous stamens and separate carpels. He will then understand that there may be as much variation in the characters of the plants of a family as there is in the members of a human family, which all present some traits in common. If he be fortunate enough to obtain a specimen of "Love in a Mist," or the "Devil in a Bush," as they are popularly called (*Nigella*), he will understand how one natural order

is linked on to another, since the carpels in this genus are partly united, showing an approach to the Papaveraceae.

For determining the names of British plants a very portable and useful book is Hayward's 'Botanist's Pocket Book' (G. Bell and Son, London), by means of which the names of plants can be honestly found out. In cases of difficulty only, the 'Illustrations of the British Flora,' by Fitch and Smith (L. Reeve and Co.), may be referred to; but to identify a plant by a picture is not to learn botany.

A few words in conclusion concerning the mode of examining fresh flowers may be useful. Large flowers should always be used in the beginning, and one flower only taken in the hand. One side of the flower should be held in the left hand, and the parts of the flower removed first from the opposite side with the right hand. If the flower be tubular, it may be slit open from below and rolled open by a movement of the finger and thumb, so as to see the attachment of the petals and stamens. To examine the ovary the oldest flower present which has lost its corolla should be chosen, as in it the ovary will be larger. A thin transverse section of the ovary should be made and laid on a dark surface, when the arrangement of the ovules will be seen. If the flower is minute, it must be dissected with needles in suitable* holders under an ordinary magnifying glass placed on a support, such as a test-tube holder or a miniature retort stand, or preferably under a cheap dissecting microscope, in which the mirror proves a great advantage.

NITRITES OF THE PARAFFIN SERIES AND THEIR PHYSIOLOGICAL ACTION.†

An investigation was commenced three years ago, in the Research Laboratory of the Pharmaceutical Society, and the Pharmacological Laboratory of the University of Aberdeen, in order to throw further light on the mode of action of the paraffin nitrites when introduced into the animal organism, and observations were made regarding the action of eleven such nitrites in a pure state on blood pressure, pulse, respiration, and striated muscular fibre. The compounds employed were as follows:—

Name.	Formula.	Boiling Point
Methyl nitrite	CH_3NO_2	Gas (12°)
Ethyl nitrite	$\text{CH}_3\text{CH}_2\text{NO}_2$	17°
Primary propyl nitrite	$\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$	48°
Secondary propyl nitrite	$(\text{CH}_3)_2\text{CHCH}_2\text{NO}_2$	39°·5
Primary butyl nitrite	$\text{C}_4\text{H}_9\text{CH}_2\text{CH}_2\text{NO}_2$	76°
Secondary butyl nitrite	$\text{C}_4\text{H}_9\text{CH}_2\text{CH}_2\text{NO}_2$	68°·5
Tertiary butyl nitrite	$(\text{CH}_3)_3\text{CNO}_2$	63°
Iso-primary butyl nitrite	$\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_2\text{NO}_2$	67°
α -iso-primary amyl nitrite	$\text{CH}(\text{CH}_3)_2\text{CH}_2\text{CH}_2\text{NO}_2$	97°
β -iso-primary amyl nitrite	$\text{C}_5\text{H}_{11}\text{CH}(\text{CH}_3)\text{CH}_2\text{NO}_2$	95°–96°
Tertiary amyl nitrite	$\text{C}_5\text{H}_{11}(\text{CH}_3)_2\text{CNO}_2$	92°

Certain of these nitrites were prepared for the first time, and some of those previously described were found to possess different physical properties to those usually ascribed to them. The selection made ren-

* Obtainable of C. Baker, Holborn, and probably other opticians.

† Abstract of a paper by Dr. J. Theodore Cash, F.R.S., and Professor Dunstan, F.R.S., in the *Philosophical Transactions of the Royal Society of London*.

dered it possible to compare the action of a series of substances containing an atom of nitroxyl, NO_2 united, respectively with CH_3 , C_2H_5 , C_3H_7 , C_4H_9 , and C_5H_{11} , and to determine the modifying influence exerted by those radicals upon the characteristic action of nitroxyl.

The first portion of the paper embodying the results deals almost entirely with the action of the various nitrites on blood pressure, and with the special apparatus used in its study. The latter part has reference to the action of the same compounds in producing contraction of striated muscle, and concludes with a chemical discussion of the whole of the results obtained.

When the effects of primary, secondary, and tertiary nitrites, alike in composition, were compared, it was found that the secondary compound had a more powerful influence generally than the primary, and the tertiary than the secondary. The more marked effect of the nitrites with the largest molecules but containing least nitroxyl is supposed to be due to their decreased chemical stability; and the greater power of secondary as compared with primary, and of tertiary as compared with secondary nitrites, is attributed to their respectively greater instability, rather than to the number of methyl groups attached to the carbon combination of the nitroxyl group.

OPIUM TRADE OF MACAO, CHINA.

Opium is, as hitherto, the most valuable article of import and export. It is imported crude, and exported mostly prepared. The opium farmer, however, is the sole person who enjoys the monopoly of boiling down the drug; but other parties have the privilege of importing and exporting it in a raw condition. During last year no agreement was again concluded with the opium farmer in Hong-Kong, so that the San Francisco and Australian steamers have had to call at Macao to ship their valuable cargoes. This new order of things is far more economical than the former régime, when the opium farmer had to be paid a heavy sum for the permission of passing the prepared opium through his preserves in Hong-Kong. The statistics before me for the first half of 1893 show a decrease both in the import and export of opium. Nor can the second half of the year have been more satisfactory, as even assuming that heavy stocks had to be worked off, the general opinion is that a reaction would have taken place before long had not the falling exchange completely paralysed this trade. For the present, however, native opium has not received any impetus nor come into favour. In fact, little, if any, finds its way as yet so far south. Neither could smuggling be held responsible for the decrease, for though smuggling still continues, especially in the case of junks from Singapore, as they bring back opium in lieu of remittances, now that the rate of exchange is so uncertain and low, it cannot have assumed such vast proportions as to have diverted any so very considerable quantity of opium from the legitimate channel of importation.—*Consular Report.*

CUBEBS AND ITS ADULTERATIONS.

The microscopical investigation of cubebs and its adulterations, carried out by Dr. A. De Wevre during the spring of last year in the Museum of the Society, and at the Jodrell Laboratory in Kew Gardens, have at length been published in the *Annales de la Société Royale des sciences médicales et naturelles de Bruxelles*, tom. 3, from which the following abstract is taken. By the courtesy of the editor we are able to reproduce the figures drawn by Dr. De Wevre to illustrate his brochure.

The first chapter contains a history of the drug during the present century. The first notice of an adulteration of the drug seems to have been in 1837.* In 1882, J. Murray ('Drugs of Scinde') pointed

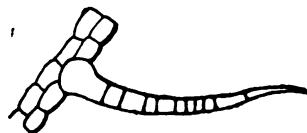


Fig. 1.—Hair of *Piper cubeba*, var. *katoentjar*.

out that the fruits of *Piper caninum* were supplied in commerce instead of those of *P. cubeba*. In 1883, Professor Baillon mentioned that *P. ribesoides* and *P. lowong* were sometimes substituted for cubebs. In 1885, Holmes and Gravill† directed attention to a spurious and injurious cubeb with a mace-like odour, which was at the time supposed to be *P. crassipes*, Korth., and a microscopical examination of it was made by Kirkby,‡ and a chemical one by Elborne and Wilson.§ In the same year the occurrence of *Daphnidium cubeba*|| in English commerce as a substitute for cubebs was recorded, and the fruits were examined

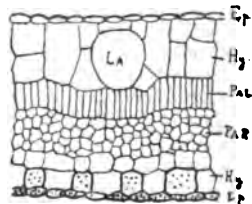


Fig. 2.—Leaf of *P. cubeba*, var. *katoentjar*, transverse section.

by Braithwaite and Farr.¶ In 1886, MacEwan** directed attention to the presence of the fruits of a *Rhamnus*, black pepper and, pepper stalks, and of the flowers of an *Alpinia*, in cubebs imported from Bombay. In 1887, Kirkby†† gave the histology of a large cubeb which was offered as a substitute for the genuine drug.

In the same year the presence of immature cubebs in the commercial article was noticed, and it was found that these would not give the iodine reaction that the mature fruits afford, and it was suggested that this

* 'Foy. Bull. de Therapeutique,' 1837, p. 352.

† *Pharm. Journ.*, [3], xv., pp. 909, 1005.

‡ *Pharm. Journ.*, [3], xv., p. 653.

§ *Pharm. Journ.*, [3], xvi., p. 517.

|| *Pharm. Journ.*, [3], xv., p. 614.

¶ *Pharm. Journ.*, [3], xvii., p. 281.

** *Chemist and Druggist*, 1886, p. 620.

†† *Pharm. Journ.*, [3], xviii., p. 269.

peculiarity might be due to the presence of glycosuccinic acid, which, according to Messrs. Brunner and Chuard, occurs in unripe fruits, and forms with iodine a soluble and colourless compound.* In 1889, Lowe



Fig. 3.—Median vein of leaf of *P. cubeba*, var. *katoentjar*, transverse section.

observed that in some immature cubebes the endocarp was absent and the embryo rudimentary. In the same year M. Brunotte recorded the occurrence as an admixture with cubebes of the fruits of *Eriodendron*, *Cubeba clusii*, *Rhamnus*, and pimento.† Gehe also described four forms of cubebes occurring in the ordinary commercial article.‡

In 1892, Dr. Treub pointed out in S'Land's 'Plantentuin' that the natives of Java recognise three varieties of the cubeb plant, which they call respectively *Rinoc katoentjar*, *Rinoc badak*, and *Rinoc tjaroelock*. In

1. *Piper cubeba*.—By a microscopic examination he has confirmed the fact, observed by Holmes, that the *Rinoc katoentjar* is identical with the genuine cubeb, of which the following are the chief characteristics: The stem and leaves are furnished with simple uniseriate pluricellular hairs, and the nerve of the leaf has a planoconvex section (Figs. 1 and 3). The section of the fruit has the structure ascribed to it by Kirkby and others, the principal points being the prismatic shape of the sclerenchymatous cells of the endocarp, which are arranged radially in a single row, and the compressed parenchymatous cells of the mesocarp, of which there are usually only four rows (Fig. 4). The fruit is 4–5 mm. in diameter, and the pedicel is 5–7 mm. long. The fruit gives a carmine red colour with strong sulphuric acid. Dr. De Wevre could not confirm Dr. Tschirch's statement that the walls of the oil glands are lignified. In the powder the prismatic stone-cells of the endocarp should occur, and comparatively few tracheids; these latter are more abundant if many of the pedicels are present. If iodine gives a blue colour it is necessary to determine if this is due to the small polygonal starch grains, without hilum or concentric rings, or to particles of cellular tissue. In the latter case rhamnus fruits may be suspected to be present.

Among the samples in the Museum of the Society, slight differences were observed. In those from the Bagelen and Cheribou and Djohjokarta districts in Java, the plants had shorter hairs; in some the endocarpic cells were longer or broader, and the number of rows of compressed cells in the mesocarp varied slightly.

2. *Rinoc badak*.—This variety of the cubeb differs from *Rinoc katoentjar* in the absence of hairs on the stem and leaves, and in the fact that there is a layer of thick-walled cells under the upper as well as under the lower epidermis. The fruit bears a very strong resemblance to the genuine cubebes, but the cells of the mesocarp form eight to nine, or even twelve rows, and sulphuric acid gives a yellow brown or orange tint with the crushed fruit. Dr. De Wevre identifies the cubebes with a macy odour described by Kirkby (*Pharm. Journ.*, [3], xv., p. 653), and the *Piper crassipes* of Elborne and Wilson, with *Rinoc budak* (which, however, Holmes refers to *P. sumatranum*). Dr. De Wevre, from the examination of specimens in the Kew Herbarium, has arrived at the conclusion that the *Rinoc badak* is not identical either with *P. crassipes*, Korth., or *P. sumatranum*, Miq.

Rinoc badak appears to vary within certain limits. A specimen from the Soerabaya district shows a slight difference in the fact that the sub-epidermal stone-cells do not form a complete ring, but are separated by wide interspaces, and the endocarpic stone cells show a tendency to become polygonal.

Another sample from the Soerakarta district approaches *Rinoc badak* in the glabrous leaves and stems, in the mesocarp presenting six or seven rows of cells, and in the endocarp having polygonal or rectangular stone-cells in addition to the prismatic ones, but the fruit gives a carmine-red tint with sulphuric acid.

3. *Piper cubeba*, var. *crassipes*.—Under this name Dr.

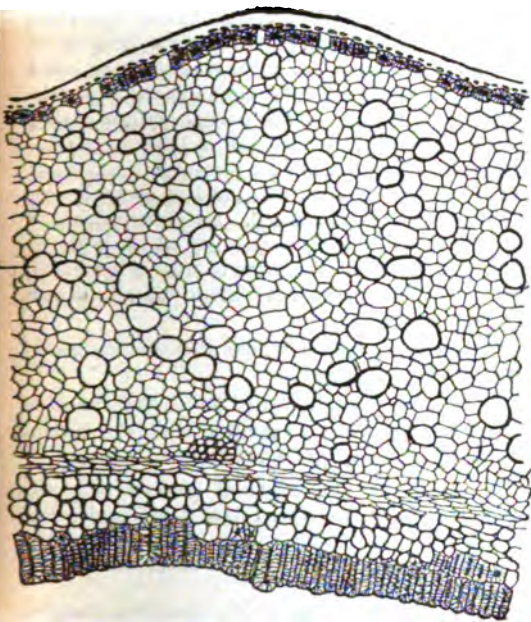


Fig. 4.—Fruit of *P. cubeba*, var. *katoentjar*, transverse section.

the same year Holmes directed attention to *Piper ribesoides*, as likely to be occasionally substituted for cubebes, and Brooke made a chemical examination of the fruits.§

All these adulterations, together with numerous specimens from different museums and authentic specimens of the fruits from the herbarium of Kew, the Pharmaceutical Society of Great Britain, etc., were examined by Dr. De Wevre, who has given a very detailed description of the stems, leaves, and fruits of the specimens examined.

* *Pharm. Journ.*, [3], xviii., p. 461; xvi., p. 917.

† 'Thèse de l'École supérieure de Pharmacie de Nancy.'

‡ *Pharm. Journ.*, [3], xx., p. 243.

§ *Pharm. Journ.*, [3], xxiii., pp. 121, 784.

De Wevre describes a fruit 7 mm. in diameter, 7 mm. long, with a pedicel 11 to 15 mm. long, or about twice as long as the fruit, and flattened throughout, and states that it has the odour of mace, and a more bitter and less burning taste than true cubebs; sulphuric acid gives with the crushed fruit a brown coloration only. The illustration he gives is almost exactly identical with that given by Kirkby, except that in the latter there are scattered groups of stone cells in the epicarp, and the mesocarpic cells are in eight to ten rows. The endocarpic cells are polygonal and arranged in two rows, and the mesocarpic cells are in six or seven rows (Fig. 5). Dr. De Wevre has examined a cubeb fruit in the Kew Herbarium, which had been determined by Miquel himself as *Cubeba officinalis*, Miq. This specimen, however, has an endocarp approaching to that of the *P. cubeba* var. *crassipes*,

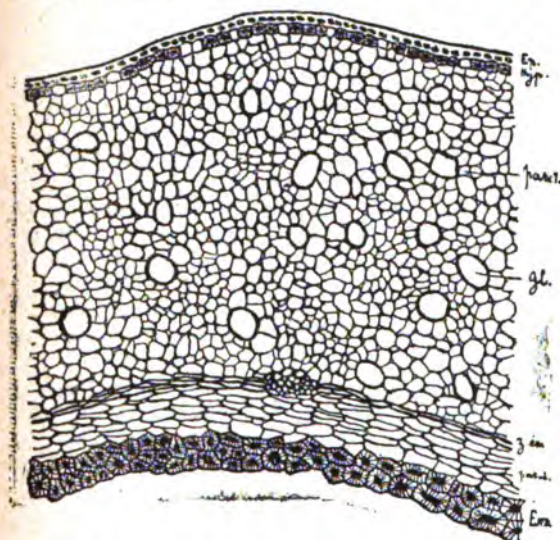


Fig. 5.—Fruit of *P. cubeba*, var. *crassipes*, transverse section.

De Wevre, the endocarp being formed of polygonal, somewhat flattened cells, a little elongated tangentially, and arranged in two rows. With sulphuric acid the fruit gave a brown red coloration. He suggests that it may perhaps be the *Rinos tjarvelock* of Dr. Treub.

(To be continued.)

IMPORTS OF ASAFETIDA INTO SIND AND BRITISH BALUCHISTAN.

In a recently issued "Return relating to the External Land Trade of the Province of Sind and British Baluchistan for the official year 1893-94," it is stated that the trade in asafetida rose from fifteen maunds, of the value of 1800 rupees, in the year 1892-3, to 197 maunds, of the value of 23,640 rupees, in the year just ended, being an increase of 182 maunds, and a value of 21,840 rupees, wholly in imports from Kandahar. In drugs of other kinds the import trade declined to the extent of 340 maunds, valued at 714 rupees, chiefly from Kandahar.

CITRIC ACID IN CANE JUICE.

The following account of the appearance of citric acid in the process of sugar manufacture is given in a letter from Mr. Edmund C. Shorey, of Kohala (Hawaiian Islands):—

"An examination of the organic matter showed that the chief constituent was citric acid, and this combined with lime as calcium citrate formed the body of the scale. I have by decomposing the scale with sulphuric acid, forming sulphate of lime and setting free the citric acid, filtering and evaporating, obtained quite large crystals of citric acid. There are several other organic acids present, the nature of which I have not yet determined, but the citric acid predominates, and is the one that gives most trouble, owing to the property of calcium citrate being more soluble in cold than in hot water, and consequently of being precipitated from a boiling solution. Unless most of the calcium citrate is precipitated in the triple effect it will be in the vacuum pan, and going into the first molasses make trouble with the second sugar. Here it shows itself as a fine grain or cloud, much like 'false grain' in appearance, and having the same effect in centrifuging, preventing the purging of molasses. A strike of No. 2, which cannot be dried owing to the presence of calcium citrate, will generally dry when cold, enough of the calcium citrate having entered into solution to allow the molasses to go free. I have seen this citrate of lime present in No. 2 sugar to the extent of 3 or 4 per cent., and of course lowering the polarisation that much. Its presence can be determined by dissolving a quantity of the sugar in water, and allowing the solution to stand a few hours, when the citrate of lime will settle to the bottom as a fine white powder."

Citric acid also makes its appearance in the manufacture of Sorghum sugar.

"Mr. Oma Carr, of the United States Department of Agriculture, has recently examined a scale or deposit from the Sorghum sugar house at Medicine Lodge.

"Except in the proportions of lime and magnesia this is not unlike the scale I have been considering, and the similarity extends to the organic matter, Mr. Carr having found that in this case citric acid was the predominant organic acid.

"I do not consider citric acid a normal constituent of cane juice as ordinarily found in Hawaii, and whether in this case its presence is due to the extremely dry weather or to the fact that the cane is green I cannot tell. An examination of green cane juice during a wet season would throw some light on the question."

There are two possible explanations of this interesting observation. One is, that the citric acid ferment, which is probably ubiquitous, may have got access to the cane juice in the early stages of sugar manufacture. The other is that the tissues of the sugar-cane may under certain cases act themselves as a citric acid ferment, just as Pasteur has shown that in the absence of oxygen alcohol may be produced in fruits and without the intervention of yeast.—*Kew Bulletin*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, OCTOBER 20, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Sothe Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

PHARMACEUTICAL APOTHECARIES.

SOME weeks ago we mentioned the fact of a proposition having been made in reference to the subject of counter prescribing by chemists, that the difficulties associated with this practice might be done away with by establishing a kind of inferior or partial medical qualification, the holder of which would be legally entitled to supplement his duties as a pharmacist by performing certain "emergency duties" of a medical nature. This suggestion, put forward by Sir BENJAMIN WARD RICHARDSON, was not by any means a novelty, for some years ago, when the Medical Defence Association was endeavouring to enforce a stringent interpretation of the Apothecaries' Act, the idea of legalising a certain amount of medical practice by chemists and druggists was for a time thought to be a feasible mode of removing difficulties existing between medical men and pharmacists. It was, however, at best but a partial remedy, since it dealt with one only of the difficulties, and took no account of the equally serious one of medical dispensing. In any case it does not appear ever to have been favourably regarded by the medical profession, and it may safely be said that with the great majority of pharmacists there was an equal indisposition to seek for such additional privileges as the proposed plan would have conferred. The view entertained by pharmacists in regard to this matter, as it now stands, has recently been well expressed by Mr. WALTER HILLS in his inaugural address, to the effect that, while ever willing to make use of his knowledge for the relief of suffering, the pharmacist will be anxious not to place himself in a false position and assume a responsibility for which his training and education have not fitted him. We do not imagine that even those who

recognise a necessity for higher training to enable the pharmacist to carry out his proper work would desire to supplement that training with additional studies for the sake of occupying an inferior position as medical practitioners.

We have always held the opinion that the maintenance of a suitable distinction between the practice of medicine and that of pharmacy is more a matter to be determined by ethical considerations than by legislation. From the mere legal point of view a chemist and druggist is under no greater disability, in regard to medical practice, than any other member of the community. Everyone is debarred by the Apothecaries' Act from "practising as an apothecary" in the sense that the term apothecary is employed in that Act. But it has been found that the true interpretation of the term "practising as an apothecary" is by no means easy. It must also be remembered that however it may be construed, the Act also contains a proviso that nothing contained in it shall be held to interfere with the business of chemists and druggists as it had been carried on before the passing of the Act. It has been maintained that counter prescribing had long before that time been a regular part of the chemist's business. Hence the difficulty which Sir BENJAMIN RICHARDSON refers to as having been experienced by the Medical Defence Association in enforcing the Apothecaries' Act, and hence the desirability of leaving the settlement of the matter to the influence of ethical rather than legal considerations. The natural relations between medicine and pharmacy are the best guarantee that the forms of practice proper to each will not be unduly entrenched upon from either side.

But it will be interesting to consider what is the nature of the "counter prescribing" to which Sir BENJAMIN RICHARDSON refers. From his description of instances in which he considers that the law was broken it may be well understood that throughout the many years he was president of the Medical Defence Association he could never see his way to bring a case of counter prescribing into a court of law as a test case. First of all it is stated that in answering a question whether a pill would purge? a chemist would be "illegally trespassing on medical pastures," and would be open to prosecution. It is, however, admitted that no man can sell a drug without subjecting himself to inquiry about what he is selling, and that he would not be considered competent to sell unless he knew something of the properties of the articles sold. Naturally that should be the case, and the capability of satisfying such inquiries should be possessed by every chemist and druggist, as distinctly within his province. But strangely enough, Sir BENJAMIN RICHARDSON holds that "the moment a druggist begins to show such knowledge of his business he technically breaks the law." We must

emphatically protest against that view as being totally untenable. The other instances given of druggists rendering assistance in cases of dog-bite and sudden bleeding from the nose cannot properly be designated counter practice, though they show how useful the chemist and druggist may be in an emergency. We cannot agree with Sir BENJAMIN RICHARDSON that they are, in any sense, breaches of the Apothecaries' Act, and his admission that no one would have the temerity to attempt a prosecution in such cases is a practical refutation of that opinion. The necessity for such assistance is in fact the best justification for rendering it, and the educated chemist may be relied upon for such first aid, without being required to enter upon studies which might lead him outside his province, and thus probably increase the confusion of medicine with pharmacy, to lessen which has been the object of recent progress.

AN UNFOUNDED COMPLAINT.

In a note on the sale of poisons in last week's *British Journal of Photography*, complaint is made of the assumed inaction of the Pharmaceutical Society in regard to poisoning by carbolic acid. It is remarked that the Society is supposed to look after such matters, as it has the power, with the approval of the Privy Council, to regulate the sale of poisons, and in support of the complaint put forward it is added that carbolic acid—a poison which is the cause of numerous deaths—is sold at every oil shop without let or hindrance, and is sometimes given away by sanitary authorities. This is supposed to be altogether inconsistent with the proceedings taken when potassium cyanide is sold by an unqualified person. The anomaly which strikes our contemporary is not, however, due to the cause supposed, and his suggestion that the Society has neglected its duty in regard to carbolic acid has no better foundation than want of acquaintance with the facts of the case.

ACTION FOR SLANDER.

In the Court of Session, Edinburgh, on Tuesday, Lord WELLWOOD closed the record, in an action by WILLIAM FOSTER, wholesale dyestuff and oil and colourman, 94, High Street, Edinburgh, against THOMAS KEATING, insect powder manufacturer, 12, Bride Lane, and two others, partners of the said THOMAS KEATING. Pursuer sues for £1000 damages. He says that defenders conceived illwill towards the vendors of rival powders, and states that they circulated widely advertisements offering rewards to any one of the public who would give such information as would lead to the conviction of any one who improperly substituted other powder for KEATING'S. The pursuer alleges that the object of the defenders was, by these means, to get up unfounded actions against traders and others for advertising purposes, and to suppress rival traders in insect powders. The defenders raised an action (see *Ph. J.* [3], xxiv., 672), against him, and interim interdict was granted in October, 1893, but the action was abandoned. He says the statements made by the defenders on record in that action were false, and were made for the purpose of harassing and terrorising him, and of slandering his character and reputation and destroying his business. For the defence, it is stated that within recent

years the defenders' business had greatly suffered on account of unscrupulous dealers selling, as Keating's powder, powder which was not manufactured by them. They were informed in September, 1893, that the pursuer had repeatedly been guilty of selling as Keating's powder, powder not manufactured by them. An action was raised, but prior to the date fixed for the proof the person who had originally given them the information intimated that he did not wish to give evidence on account of the publicity it would entail. They plead that they acted throughout in good faith, without malice, and that they had reasonable grounds for bringing the note of suspension and interdict into court.

BOURNEMOUTH AND DISTRICT PHARMACEUTICAL ASSOCIATION.

At the first annual meeting of this Association, on Tuesday, October 16, the committee presented a report of the first year's work, which had included some points of business important to the members, and had demonstrated the advantage of such an association. Mr. G. BRIDGE was re-elected President, and Mr. HARDWICK Secretary. A local secretary was then nominated for the Pharmaceutical Society, after which some conversation took place respecting the visit of the British Pharmaceutical Conference to Bournemouth next year. A committee of the whole of the members of the Association was formed for Conference reception purposes, with Mr. BILSON as Treasurer.

DEATH OF ANNUITANTS.

We have received information of the death of MARY B. ROWAN, of Plymouth, which occurred on the 12th instant, as the result of injuries accidentally inflicted at the laying of the foundation stone of a local chapel school. Mrs. ROWAN was seventy-three years of age, and had been an annuitant on the Benevolent Fund since 1891. We have also to announce the death of Mrs. MARTHA SHORT, of Lyndhurst, an annuitant, aged 84, who was elected in 1877. This is the third death of annuitants on the Benevolent Fund within little more than a fortnight.

UNIVERSITY DISTINCTION.

We note that WILLIAM GRIFFITH, a chemist in business at Barrow-in-Furness, who passed the Minor examination of the Pharmaceutical Society of Great Britain in 1888, has just obtained the degree of Mus. B. at Durham University.

PRESENTATION AT PLYMOUTH.

MR. JAMES COCKS, the Honorary Secretary of the Plymouth District Chemists' Association, has been presented with a silver-mounted cigarette case by the members of the junior section of the Association, as an expression of their sense of his efforts on their behalf.

EVENING CLASS IN HISTOLOGY.

We are asked to announce that an evening class in histology will be held in the histological laboratory of the Pharmaceutical Society, 17, Bloomsbury Square, under the direction of the Professor of *Materia Medica*. A short explanatory lecture will be followed by about two hours' practical work. Particulars of the class may be obtained of the Professor of *Materia Medica*, 17, Bloomsbury Square, W.C.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

(Continued from page 299.)

The Curator presented the following report of donations to the Society's Museums and Herbarium:—

To the Museum in London.

- Mr. H. B. Cox, Shepton Mallet:
Specimens of the fruits of *Carya olivaeformis*.
The Imperial Institute:
Specimens of Madras nux-vomica seed.
Sir F. von Mueller, K.C.M.G., M.D., F.R.S., etc., Melbourne:
Fruit of *Banksia grandis*.
Mr. A. H. Jackson, F.I.C., Melbourne:
Specimen of Iguana oil.
Dr. Geo. Watt, C.I.E., Calcutta:
Leaves of *Gymnema Sylvestre*.
Messrs. T. Christy and Co.:
Specimen of "Simulo" fruits.
Mr. R. Thomson, Bogota:
Specimen of bark from U.S. Colombia.
Mr. J. H. Hart, F.L.S., Botanic Gardens, Trinidad:
Specimen of dried Cola nuts cultivated in Trinidad.
Dr. J. E. T. Aitchison, C.I.E., F.R.S.:
Specimen of *Asafoetida* collected in Kashmir from the stems of *Ferula narthes*.

To the Museum in Edinburgh.

- Mr. J. Wight, Edinburgh:
Specimen of native Orpiment in crystals from Afshar, N.W. Persia.
Messrs. Duncan, Flockhart & Co.:
Follicles of *Strophanthus hispidus*.
To the Herbarium.
The Director, Botanic Gardens, Jamaica:
Specimen of *Aloe vulgaris*.
Sir F. von Mueller, K.C.M.G., M.D., F.R.S., &c.:
Eleven specimens of Australian plants.
Mr. J. Medley Wood, Botanic Gardens, Natal:
Fifteen specimens of South African medicinal plants.
Mr. R. Thomson, Bogota:
Specimen of *Cinchona pombiana* with flowers and fruits.
Mr. R. J. Lynch, F.L.S., Botanic Gardens, Cambridge:
Flowering specimen of *Pilocarpus jaborandi*.
The Curator:
Specimens of *Teucrium chamaedrys* and *Stachys germanica*, from Oxfordshire.

American Pharmaceutical Association.

The forty-second meeting, at Asheville, N.C., which was continued from September 3 to 8, proved very enjoyable and profitable to a numerous attendance. The address of the president, Professor Patch, was delivered on the afternoon of the first day, and contained many valuable suggestions. He did not take a very rosy view of the condition of the drug trade in the United States, where, as in Canada, it is very much overdone. He thought that with about one-third the existing number of druggists, and one-sixth of doctors, people generally would be better off—an opinion which met general approval, as every pharmacist at once classed himself with the lucky third, and his neighbour with the unfortunate balance. Professor Patch recommended to the Association an inquiry into the necessity for the establishment of a pharmacy com-

mission, and the substitution of a national law for the various State enactments, so that educational requirements would be the same all over the Union. He suggested that a course of instruction in pharmacy be prescribed for the use of pharmaceutical colleges, and also proposed the establishment of a scholarship fund, of an annual value of \$1500, to assist those who wished to take an advanced course abroad.

The total membership of the Association was announced to be 1534. The financial statement showed the receipts for the year to have been \$12,184.98, which, however, included the cash balance of \$5,191.14 of the previous term. The disbursements amounted to \$7,851.96, the heaviest item being \$4,541.67 for the International Congress at the Chicago Fair.

Various places for the next meeting were suggested, among others, Montreal, but finally Denver was chosen. The election of officers was effected by the acceptance of the ticket of the nominating committee, by which Mr. W. Simpson, of North Carolina, becomes president; Mr. C. M. Ford, Denver, first vice-president; Mr. J. V. Hurty, Indianapolis, second vice-president; and Mr. J. E. Morrison, Quebec, third vice-president. Mr. S. A. D. Sheppard continues in the office of treasurer, which he has so long held, with Mr. C. Caspari as permanent secretary, and Mr. Kraemar, reporter on the progress of pharmacy.

Probably the most lengthy and animated discussion related to the subject of "free alcohol." At the last session of Congress an amendment was offered by Senator Hoar, and carried, that any manufacturer using alcohol in the arts, or in any medicinal, or other like compound, shall, under certain conditions, be entitled to a rebate of the duty on spirit so used. The Commissioner of Internal Revenue has found it very difficult to draft regulations in regard to this matter, and to define exactly what is meant by the terms "manufacturer" and "any medicinal or other like compound." A resolution commending the action of Congress for legislating favourably in regard to free alcohol was offered by a member of the Association, but this was objected to on the ground that the meaning of the privilege was not yet understood, and a committee was appointed to consider the subject. They reported to the effect that the regulation and control of alcohol for manufacturing and medicinal purposes was in a broad sense practically impossible. They protested against any interpretation of the law, except that which would exempt alcohol used in the manufacture of such products as show an entire change of chemical and physical properties—such as ether, chloral, and chloroform. This naturally aroused the retail element, as druggists would thus be cut off from any participation in the advantages of the new regulations. A very acrimonious debate followed, but the recommendation of the committee was carried.

The question of cut rates was brought before the Association, and, after the usual modes of meeting the difficulty had been brought forward and talked over, it was resolved that the Association endorse the views of the Interstate Retail Druggists' League, by which the contracting parties agree to withdraw their patronage from those who knowingly supply cutters with goods of any description, and also agree to discontinue the sale of any patent or proprietary articles furnished to cutters by manufacturers or their agents. Whether the A. P. A. is to be bound by this resolution, or the individual members of the body, or whether the action is to have any practical effect, is not clear.

At a late stage of the meeting the subject of "physicians' supply" houses was brought forward, and resolutions were adopted condemning the practice of manufacturing pharmacists selling ready-made medi-

cines directly to physicians, and recommending the withdrawal of the patronage of druggists from all firms who engage in such direct sales.

Many interesting papers were read before the scientific section, whilst the section on legislation and education took up the report of the committee appointed last year to consider the subject of pharmaceutical education, with particular reference to the age, experience and education of those graduating at colleges of pharmacy. It was recognised that the Association had not much jurisdiction in this matter, but it was finally thought well to endorse the resolutions of the International Congress at Chicago. These recommended a preliminary examination for apprentices, a term of apprenticeship of four years, including time spent at college, and a compulsory curriculum of studies, including chemistry, pharmacology, and pharmacy.

The committee on the president's address reported favourably on the proposition respecting the formation of a course or curriculum of studies for the consideration of colleges of pharmacy, but adversely on the suggestion as to the enactment of a national pharmacy law, and also that recommending the establishment of a scholarship fund.

The programme of the entertainment committee was carried out to the satisfaction of everybody, and the visitors to Asheville departed, carrying with them the pleasantest recollections of the meeting and of the hospitalities of North Carolina, which are continually proverbial.—*Canadian Pharmaceutical Journal*.

Proceedings of Societies in London.

BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 17, Bloomsbury Square, on Wednesday, October 10. Present:—Mr. N. H. Martin (President); Messrs. Atkins, Carteighe, and Toone (Vice-Presidents); Messrs. Holmes, Bird, and Farr; Messrs. Naylor and Ransom (Hon. Gen. Secs.), and Mr. Nightingale (Assistant Secretary).

The minutes of the previous meeting were read and confirmed.

A sum of £4 was granted to Mr. E. J. Parry, B.Sc., for expenses to be incurred in a chemical investigation of sandal-wood oil.

The date of the meeting of the Conference to be held at Bournemouth, in 1895, was considered, and it was resolved that the business should commence on Tuesday, July 30, and the reception be held as usual on the previous evening.

A letter was read from Mr. H. Mathews on behalf of the chemists of Oxford, thanking the Conference for the gift of books provided by the Bell and Hills Fund.

The following suggestions were made in connection with the reading and discussion of papers at the annual meeting:—

1. That the actual time for the discussion of the papers should be three days instead of two.
2. That the meeting on each morning should commence at 9.30 instead of 10, and should continue each day until 1.30.
3. That the afternoon of each day should be devoted to outings, and that there should be no papers read in the afternoon of any of the three days.

After full discussion it was unanimously decided that it was not desirable to make any alteration of time in connection with the reading of papers.

Eleven gentlemen, having been duly nominated, were elected to membership.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A musical and social evening was held at 103, Gt. Russell Street, on Thursday, 11th inst., when the chair was occupied by Mr. S. M. Burroughs. The entertainment was under the direction of Mr. G. Roe, and was thoroughly enjoyed by the large number of members present.

PHARMACEUTICAL FOOTBALL AND CRICKET CLUB.

A general meeting was held at 17, Bloomsbury Square, on Monday, October 15, for the election of officers. The result of the ballot was as follows:—Captain, Mr. P. K. Allen; Vice-Captain, Mr. A. Lilly; Committee, Messrs. Brown, Moore, Simpson, Skinner, Walker, Woodruffe; Honorary Treasurer, Mr. G. E. Jones; and Honorary Secretary, Mr. Tickle.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

OPENING OF THE SCHOOL OF PHARMACY.

The usual gathering to inaugurate the winter session of the Sheffield School of Pharmacy was held on Thursday, October 11, at the Cutlers' Hall, Sheffield, and was followed by the annual dinner of the Sheffield Pharmaceutical and Chemical Society. The chief feature of the first-named event was an address to the students by Mr. Charles B. Allen, of London, member of Council of the Pharmaceutical Society, which has already appeared in our columns (*ante*, p. 303). The President of the Society, Mr. J. F. Eardley, occupied the chair, and there was a good attendance, including most of the officers of the Society and several pharmacists from a distance.

Mr. G. Squire, Hon. Sec. of the Society, announced that he had received letters apologising for absence from Mr. M. Carteighe, President of the Pharmaceutical Society; Mr. R. Bremridge, Secretary to the Pharmaceutical Society; Dra. Snell, Martin, Burgess, Littlejohn; and Mr. Geo. S. Woolley, President of the Manchester Pharmaceutical Society; Ald. W. Smith, President of the Sheffield Literary and Philosophical Society; Dr. Paul, Editor of the *Pharmaceutical Journal*, the Editor of the *British and Colonial Druggist*, and Mr. A. H. Allen, city analyst.

Mr. C. O. Morrison, Hon. School Secretary, then read the following report of the school for the session 1893-94. "The number of entries in the classes of the school during the last session was twenty-six. The lecturers (Mr. J. Austen and Mr. J. C. Platt, F.C.S.) report that the progress made by the students has been satisfactory, whilst the attendance throughout the session shows an average of 82 per cent. It may be stated that the classes are held at night after business hours, and on the Thursday half-holiday. On the last-named day, when apprentices might be excused for using the time for other purposes, the average attendance at the two chemistry classes has been 86 per cent., which affords strong evidence that the students appreciate the efforts made on their behalf. The following were the prize-winners:—Materia Medica, Council prize, W. H. Ludlam, lecturer's prize, H. J. Morris; Botany, Council prize, A. Exell, lecturer's prize, J. E. S. Milligan; Chemistry, Council prize, H. J. Morris, lecturer's prize, A. Wager; Practical Chemistry, Council prize, F. A. Lester, lecturer's prize, A. Wager; President's prize for all subjects, W. H. Ludlam and W. E. Pigott, equal.

The Chairman said he was glad that the attendance at the school had been so good. It was very gratifying.

ing when they remembered that the students gave up their evenings to the classes, and also their half-holiday. If apprentices in their early days would attend the classes regularly, they would not find so much difficulty in the examination room as at present, and they would not hear so much about the examiners, because those gentlemen, on probing beneath the surface, would find a solid foundation instead of merely veneer. Amongst the students present in their school five years ago there was scarcely one to-day who was not qualified. It was a matter of great satisfaction to the older members of the Society to know that former students of the school were now taking upon themselves the active work and duties of the Society. Their present secretary was a former student in the school.

The prizes, consisting of well-known scientific works of value to the student, were then distributed, after which Mr. C. B. Allen delivered his address (*ante*, p. 303).

Professor Greenish, in proposing a vote of thanks to Mr. Allen, said it had been his fortune in the course of some years to listen to addresses and addresses, but he could honestly say he never listened to one which had given him more satisfaction and pleasure than that delivered by Mr. Allen. Mr. Allen and himself had had frequent talks about education at Bloomsbury Square, and their opinions on such matters were much the same. He cordially endorsed the advice which Mr. Allen had given to the students. As a teacher at Bloomsbury Square he knew that one of the principal difficulties of the staff there lay in the fact that students were brought before them with a very slender foundation of knowledge to build upon, and the teachers were confronted with the difficulty of endeavouring to compress into a very few months an education that ought to extend over a very much longer period. If apprentices and students, especially apprentices, when they first entered the business would begin at once to lay a foundation on which a structure might be raised in later days, it would not only facilitate the work of the teachers, but would be of immense benefit to themselves. If students would enter into familiar intercourse with their teachers, as advised by Mr. Allen, they would derive much benefit therefrom. It was much to be regretted that many students regarded their teachers not as men who wished to help them, but rather as persons from whom they were obliged to learn.

Mr. G. Owen, in seconding the motion, raised a laugh by remarking that student life had been painted in such glowing colours that it made some of them who were getting on in years almost wish to go through it again.

The Rev. T. S. King, in supporting the vote, said it was an exceedingly thoughtful, intellectual and business-like address that they had been privileged to hear. There had been crowded into it food enough for reflection until they opened their session again next year. If the students would act upon the advice which had been given to them they would grow up very happy in their profession and very useful in their day and generation. The address had been stimulative and inspiring. The danger nowadays was that young men were patted on the back so much that they began to think that the obligation was on the side of their teachers and helpers, rather than the other way. In conclusion, Mr. King congratulated Mr. Eardley on his election as President of the Society, and said he hoped his year of office would be a happy and a successful one.

The motion was carried with acclamation.

Mr. Allen, in responding, said he had told the students nothing but what to some extent was the outcome of his own experience. He was satisfied that

the great weakness in pharmaceutical education was that sufficient time was not devoted to it. Their qualification should follow as a sequence to other things. When they had gained their qualification they would readily admit that that, after all, was not the great end of study. The meeting then terminated.

THE ANNUAL DINNER.

Subsequently, in the old banquetting chamber of the Cutlers' Hall, the annual dinner of the Society was held, and was well attended. Mr. J. F. Eardley presided, and amongst those present were Mr. Charles B. Allen (London), Mr. J. Rymer Young (Warrington), Professor Greenish (London), Mr. Edmund White, B.Sc. (London), Professor Arnold, Mr. John Humphrey (*Pharmaceutical Journal*), Mr. S. T. Rhoden, and Mr. G. Owen, Vice-Presidents of the Society, Mr. G. T. W. Newsholme, Treasurer, Mr. G. Squire, Hon. Secretary, Mr. C. O. Morrison, Hon. School Secretary, Mr. G. Ellinor, Mr. A. R. Fox, Mr. J. P. Hewitt, Mr. H. E. Ibbitt, Mr. J. Preston, Mr. W. Ward, Mr. C. H. Hewitt, Mr. W. Dale James, M.R.C.S., and Mr. J. H. Worrall.

The loyal toasts having been honoured,

Mr. C. B. Allen proposed "The Sheffield Pharmaceutical and Chemical Society." He said a perusal of the syllabus for the current session reminded him that he was the ninth member of the Pharmaceutical Council who had come to inaugurate the session of the Sheffield School of Pharmacy—a proof of the loyalty felt amongst the pharmacists of that city for the Council. They all lived close enough to Bramall Lane to know the significance of the ninth man in. He was not expected to score. Shortly after his election to the Pharmaceutical Council he was in a railway train with other members of the same calling. The conversation turned on the election of members to the Council, and one gentleman said, "I always begin by scratching out all the Londoners; they are no good." He did not ask him for his definition of a Londoner, but he (Mr. Allen) found that in London anything like local spirit or local action was almost entirely wanting. A Londoner was imperial if they liked, but in anything local he was altogether handicapped. He hardly knew what his own district was, and even if he could define its boundaries, he found it altogether beyond his power to meet those of the same vocation within it. It was, therefore, very difficult to get local action. He wanted to impress upon those chemists who employed apprentices the importance of educating them for the vocation to which they were called. It seemed to him there could be no better bond of union than an association of master and apprentice in the interests of education. The career of the apprentice or pupil was bound up with the master, and it behoved every man who took pupils for the serious and responsible calling of pharmacy to be sure that at the outset of their career he recommended to them to the best of his ability the resources which lay at their door. The practical training of the apprentice lay within the daily work of the pharmacist, but his technical training was not so easy. The existence, however, of the School of Pharmacy in Sheffield did away with the difficulty, and he appealed to every master to see that his apprentice attended the school.

The President, in responding, said Mr. Allen's allusion to the "ninth man" was a very happy one, because they all knew from their cricketing experience of the past season that the ninth man at Bramall Lane had often been the mainstay of the club. Their society in Sheffield had three uses. The first of their objects was to promote a feeling of fellowship amongst them. By their monthly meetings the Council tried to place before the members something instructive

and useful, and he wished masters would turn up to them the same as to the annual dinner. He considered the main object of the Society was to promote the education of apprentices. He would like to see the curriculum. He knew many masters did not approve of it, but when they got the curriculum they would not have so many complaints about the examiners. His experience of the examiners was that they were perfect gentlemen. Some students thought they were bound to be "plucked" on going before certain examiners, but his experience was that the examiners were men who would give students every assistance in showing what knowledge they possessed. If they had the curriculum and the young men were compelled to attend a course of lectures during their apprenticeship, it would be a great advantage both to themselves and their employers. Like all others, their Society had its ups and downs, but he hoped they were now in flourishing condition. He knew they were not so financially, but they would get over that.

Mr. H. E. Ibbitt proposed "The Pharmaceutical Society of Great Britain." In the course of a speech, only imperfectly heard, he said he had that night to play the part of the candid friend, and to give the gentlemen who would respond something to say. Whilst acknowledging the good work done, there was a great deal of dissatisfaction abroad, both amongst those who supported the Pharmaceutical Society in the most strenuous manner and those who were inclined to grumble at it. It was a matter for regret that so many qualified men held aloof from the Pharmaceutical Society. He would like to see the whole body connected with the Society, but it was well that some of the reasons why it was not supported as generally and heartily as was desirable should be looked at. All sorts and conditions of men in former years came into their body, and after twenty-five years government by the Pharmaceutical Society was it not much the same now? He thought it was, with a little variation. One man could not get in as he could before, and five or six men could not, but the magic number was seven; seven men who had tried to pass an examination and had failed could form a limited company and advertise themselves as cash chemists and family chemists all over the country. That was not a satisfactory state of affairs. There were many things in which the Society could have led them to a successful issue, but which it had neglected. If the limited companies to which he had referred could not be put down it would become a question whether those who managed them should not be registered, and in such a manner that the general and local societies could at once fix on the man who was responsible for the business. The companies made a great profession that they employed qualified men, but how was it to be known. There were many other practical subjects which the Pharmaceutical Society might have taken up. However, he had faith and hope in the future, so much so that he had no hesitation in asking them to honour the toast.

Mr. G. T. W. Newholme, in responding, said he did not hear a great portion of Mr. Ibbitt's speech, but he was sure what he said was well meant. He had to remind him, however, that the Council of the Society had to administer a law, and could not go beyond it. The Council of the Society would be only too glad to stretch that law if they could—to stretch it, perhaps, to protect some of the members—but in the present state of public business it was utterly impossible for their body or any other to get protective Acts. Parliament could not see anything but the public good. The Council had done great work, not only for chemists as a body, but for the protection of the public. They might do an even greater work if the two-thirds of the trade now holding aloof from the Society would join it.

Then they might get practical protection to any extent. Much as it was abused, the Society had a position to-day. In 1868 it was the means of getting an Act of Parliament passed which created a register of chemists and druggists. That alone was a valuable piece of work, giving chemists a standard they had never reached before. The chemist was now a recognised individual. He ranked, perhaps, a little lower than the professional man, but he bordered on that line, and had a position such as no other tradesman enjoyed. The work of the Council of the Society was recognised by such a distinguished body as the Royal Society, and one of the oldest London companies—the Salters' Company. Both had given help, showing that the Society must have attained a splendid position. Although it only numbered one-third of the chemists of the country, it was legislating for the whole of the chemists of the kingdom. In conclusion, Mr. Newholme said in Sheffield they were loyal to the Society.

Mr. J. Rymer Young, who also replied, said he did not appear in any way as an apologist for the Pharmaceutical Society, nor was he in a position to go into the questions which Mr. Ibbitt had raised. Mr. Newholme had very effectively dealt with the matter, but there was no reason why he should not tell Mr. Ibbitt that what he took to be the head and front of his complaint—company trading—hit every member of the Pharmaceutical Society as hard as it hit the proposer of the toast. If by any Act they could obliterate that nightmare it would be done, but they had no powers beyond the statutes they now possessed. Hundreds of most important Bills in Parliament were shelved for want of time, and under those circumstances was it within the range of what was practical to introduce at the present time an amended Pharmacy Act which should contain provisions such as had been suggested by Mr. Ibbitt? The Council of the Society consisted of men who were doing their level best to remedy the evils with which pharmacists were surrounded, and to make the lot of the average pharmacist better. He had been struck at the assiduity and persistence with which members of the Council had sacrificed their time in the interests of the pharmaceutical community, and he had also been struck with the deplorable ignorance and the astounding apathy which seemed to pervade the moral atmosphere outside the Society. It seemed to be the privilege of a large number of people to regard the Society as a sort of football, to be kicked by everybody who happened to have lost a customer through competitive trade. Whilst he had no sympathy with such conduct, he was inclined to think it would be wise to occasionally alter the complexion and constitution of the Council by the infusion of a little new blood. At the same time, he would recommend them in Sheffield not to part with their present representative on the Council sooner than they could help. It would be a pleasure to the members of the Council unable to be there that night that in their festivities, as in their work, they had been remembered, and it would be the constant endeavour of the Council to anticipate and fulfil the wishes of their constituents.

Mr. C. O. Morrison, in a humorous speech, proposed the health of the examiners and professors of the Pharmaceutical Society of Great Britain. He spoke of the eminent men who had filled the positions, and said he believed such professors as Mr. Greenish would do all in their power to impart that knowledge to the students which would be a benefit to them and the community, and that examiners such as Mr. White would do everything in their power to do that which was fair to the candidate, and to the public.

Professor Greenish, in replying, said there was a suggestion some time ago that the school in Bloomsbury Square was scarcely any longer a necessity. He

ventured to differ with those who took that view, and he thought he had the Council of the Society with him. The Council had persistently and systematically advocated education. Having pointed out the tendency of the instruction given at Bloomsbury Square, the professor said that whether the teaching staff would succeed in giving students an education equal to the demands and wishes of the Council remained to be seen; he only asked them to believe that it was the earnest endeavour of every member of the teaching staff to render that a fact, and not simply a possibility.

Mr. White, who also replied, said some contended that the examiners were a bad lot, but it was generally the unsuccessful candidates who took that view. He could assure them that every member of the Examining Board approached a candidate, not with a desire to pluck him, but with a desire to bring out his knowledge to the best advantage.

Several minor toasts followed, and the company dispersed at a late hour.

PLYMOUTH AND DISTRICT CHEMISTS' ASSOCIATION.

ANNUAL MEETING AND DINNER.

The annual business meeting of this Association was held at the Foresters' Hall, Plymouth, on Wednesday, October 10, at 2.30 p.m., for the election of officers for the ensuing year, and other business. The chair was taken by Mr. J. G. Netting, President.

The following was the result of the voting:—

President, Mr. C. J. Park; Vice-Presidents, Messrs. G. Breeze and J. G. Netting; other Members of Committee, Messrs. Freeman W. Hunt, J. D. Turney, A. D. Breeze, P. Kelly, Martin Johnson, and F. Maitland; Auditors, Messrs. C. Menhinick, and J. Barge; Hon. Treasurer, Mr. J. Harvey Bailey; Hon. Sec., Mr. James Cocks.

Fifteen new members were elected, and two honorary members. The Treasurer and Secretary's reports were adopted, and the outlook for the ensuing year was considered very satisfactory.

The first annual dinner was afterwards held at Matthew's Restaurant, Mr. J. G. Netting (President) being supported in the chair by the Mayor of Devonport (Mr. W. Waycott), the chairman of Stonehouse Local Board (Mr. W. W. Blight), and other guests. During dinner a programme of music was efficiently rendered by an orchestra under Mr. J. N. Pearce.

The loyal toasts having been honoured, Mr. J. D. Turney proposed "The Pharmaceutical Society." He spoke at length of the objects and benefits of the Pharmaceutical Society, and said sympathy should exist between every chemist in the country. Those who were interested and watched the gradual growth of the Society, particularly from an educational point of view, had need to be proud. They all felt it was a matter of satisfaction that the Society was in the hands of such a worthy president as Mr. Cartelge.

In responding, Mr. Randle dealt with the sale of poisons and drugs generally. They must show Parliament, he said, that their interests were identical with those of the public. It would be a safeguard to the public if the sale of poisons were limited to qualified chemists.

In supporting Mr. Randle, Mr. Hunt hoped the Society would continue to do the good work it had done in the past. Throughout the country there were 20,000 chemists, and at the present time only 4,000, or a fifth of that number, were members of the Society. Until they obtained a larger footing it would be useless presenting bills to Parliament.

The toast of "The Plymouth, Devonport, Stonehouse, and District Chemists' Association" was pro-

posed by Mr. W. W. Blight, who said the object of the Association was strictly educational. The apprentices should take advantage of that, and leave their employers efficient. Very few professions laid themselves out as they did in Plymouth, and it was a great pity such was the case.

The President (Mr. Netting), responding, said the officers during the past year had done their best to bring the Association up to its present position, and hoped the future officers would eclipse the efforts of the past. He should ever regard it as a great honour to have been their first president. He spoke very highly of their energetic secretary, Mr. J. Cocks, and he felt sure their future president, Mr. C. J. Park, would do his utmost to serve them.

Other toasts followed, the toast of the officers of the Association being responded to by Messrs. J. Harvey Bailey and James Cocks.

LIVERPOOL CHEMISTS' ASSOCIATION.

Under the auspices of this Association a conversation was held at the Royal Institution on October 11, to inaugurate the forty-fifth winter session. Mr. J. J. Smith presided, and there were also present, amongst a large number of members, Messrs. Bain and Conroy, Vice-Presidents, and Messrs. J. Smith and Anthony S. Buck, Honorary Secretaries. The programme consisted of vocal and instrumental music, in which Mr. Laddell, Mr. Bain, Mr. Delaville, Miss Nanny Rigby, Miss Edith Lucas, and Miss Sharp took part, and a lecture by Mr. A. T. Smith, Secretary of the Microscopical Society, entitled "A Drop of Water as seen through a Lantern Microscope." During the evening the visitors examined a number of interesting exhibits lent for the evening by members of the Association.

BRIGHTON JUNIOR ASSOCIATION OF PHARMACY.

A musical and social meeting in connection with this Association was held on Wednesday, October 10, at the headquarters, 2, Sillwood Terrace, under the chairmanship of Mr. O. G. Yates (the President). There was a good attendance, and, owing to the indefatigable energy of the Hon. Secretary, Mr. F. A. Crowhurst, an enjoyable evening was spent. The programme included songs, etc., by Messrs. A. E. Colman, Lander, H. G. Price, A. Smith, H. E. Hedgcock, Bridgwood, Cupitt, and A. Collins.

MEETING OF NOTTINGHAM CHEMISTS' ASSISTANTS.

The Nottingham chemists' assistants and apprentices held a soiree and smoking concert at the Eagle Restaurant on Thursday, October 11. There was a fairly good attendance. The proceedings opened with an overture by Mr. H. Woodhouse, and, following this, songs, violin solos, etc., were satisfactorily rendered by Messrs. C. Gilliat, H. Wilford, J. E. Pickerrill, T. Mason, T. Goddard, and R. H. Beverley. The proceedings, which were of a most enjoyable nature throughout, were ably presided over by Mr. T. Mason.

Dispensing Memoranda.

[651.] In reply to the communication on page 168, a correspondent writes as follows:—"The reaction in this prescription is simple. The sodium bicarbonate and calcium hypophosphite react, producing calcium carbonate, sodium hypophosphite, and free carbonic acid gas which escapes, forming a copious froth. Apparently no secondary decomposition takes place."

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

SALE OF OPIUM BY AN UNREGISTERED PERSON.

At the Bloomsbury County Court on Wednesday, October 17, before His Honour Judge Bacon, the Pharmaceutical Society sued W. F. Mundy, Managing Director of the Empire Drug Co., Ltd., 258A, Mare Street, Hackney, N.E., for five penalties of £5 each for "selling" poisons contrary to the provisions of the Pharmacy Act, 1868.

Mr. Grey (instructed by Messrs. Flux, Thompson and Flux) appeared as counsel for the Pharmaceutical Society; Mr. H. C. Richards, instructed by Mr. Rawlinson, appeared as counsel for the defendant.

Mr. Grey: May it please your Honour, this is an action to recover five penalties from the defendant, Mr. W. F. Mundy, for selling poison contrary to the Pharmacy Act, 31 and 32 Vic.

The Judge: Do you wish me to take a note of this case?

Mr. Grey: If you please, sir.

Mr. Richards: It is only a question of fact; there is no law in dispute.

The Judge: I should have thought at this stage of the history of this litigation between the Pharmaceutical Society and unregistered people it must be all a question of fact.

Mr. Richards: Yes, sir; we have paid £10 before, because we knew we were offenders, but this time we are fighting the Society on the facts.

Mr. Grey: The defendant carries on business under the title of the Empire Drug Co., Ltd., at 258A, Mare Street, Hackney, and on the dates mentioned in the particulars a prescription was handed in to him to be made up, and in that prescription there is twenty minims of tincture of opium, and in a liniment that was made up at the same time there is half a fluid ounce of opium liniment. Those prescriptions were made up by the defendant, and were sold in the bottles which I will hand in. The defendant was alone in the shop, and actually made it up in the presence of a witness whom I shall call. The medicine was supplied in a bottle with this label: "The Empire Drug Co., Ltd., 258A, Mare Street, Hackney. Prescriptions prepared with the utmost care from the very best drugs obtainable. Store prices for cash." "The liniment is for external use, to be well rubbed in. Shake the bottle." Those bottles were handed to the analyst, and the analyst will tell you that, as regards the medicine, they contained as nearly as possible twenty minims of tincture of opium, and, as regards the liniment, half a fluid ounce of opium liniment. The Act under which we are suing is the 31 and 32 Vic., cap. 21, section 1 of which makes it "unlawful for any person to sell or keep open shop for retailing, dispensing, or compounding poisons, or to assume or use the title 'chemist and druggist,' etc., "unless such person shall be a pharmaceutical chemist or a chemist and druggist within the meaning of this Act, and be registered under this Act." Section 2 says: "The several articles named or described in the schedule (A) shall be deemed to be poisons within the meaning of this Act." Under schedule A you will find opium, the very last poison mentioned, "and all preparations of opium or poppies." Then the printed register is evidence before you by section 13, which says: "The absence of the name of any person from such printed register shall be evidence, until the contrary shall be made to appear, that such person is not registered according to the

provisions of the Pharmacy Act or this Act." This gentleman's name does not appear in the register. Section 15 is the important section, which says that "any person who shall sell, or keep an open shop for the retailing, dispensing, or compounding poisons, or who shall take, use, or exhibit the name or title of chemist and druggist, or chemist or druggist," etc., "shall for every such offence be liable to pay a penalty or sum of £5, and the same may be sued for, recovered, and dealt with in the manner provided by the Pharmacy Act." Then the Act says the Pharmaceutical Society are to sue for those penalties. I will now only call your attention to two cases.

Mr. Richards: I do not dispute any of these propositions.

The Judge: Mr. Richards says his defence depends on the facts.

Mr. Richards: I do not dispute any of my learned friend's propositions up to the present.

Mr. Grey: The Pharmaceutical Society v. Wheeldon, which is reported in the 24 Q. B. D., decides that the person who compounds the poison, or makes it up, or even sells it across the counter, is the person liable to a penalty under the Act.

Mrs. Sarah Partridge, examined by Mr. Grey: Where do you reside?—Brixton.

The Judge: You are the wife of whom?—John Partridge.

What is he?—A commission agent.

Mr. Grey: Were you instructed by the Pharmaceutical Society to go to No. 258A, Mare Street, Hackney?—I was.

When did you go there?—On June 1.

What was it? Was it a shop?—It was a chemist's shop.

What was it called?—The Empire Drug Co.

Did you go in there?—Yes.

Whom did you see?—The defendant, Mr. Mundy.

Mr. Richards: That is admitted.

Mr. Grey: What did you ask him for?—I handed him a prescription.

Will you look at that? (handing a paper). Is that the prescription you handed to him?—Yes.

Did he make it up for you?—Yes.

What did he hand you?—Two bottles.

(The witness identified two bottles.)

What did you pay for them?—10d.

Did you then take them home with you?—Yes.

What did you do with them?—I sealed them up.

Did you go again to the same shop?—Yes.

What day was that?—June 12.

What did you do then?—I handed the same prescription to the defendant.

Did he make it up the same as before?—Yes.

Did you pay him for it and take the bottles home?—Yes, I paid him 11d.

(Witness identified two bottles.)

Did you go again to the same shop?—Yes.

What date was that?—June 16.

Did you do the same thing again?—Yes.

(Witness identified two bottles.)

Did you go again to the same shop?—Yes.

The Judge: How often is she to go to the same shop? Is it to accumulate penalties?

Mr. Richards: That is it.

Mr. Grey: Did the defendant serve you with those?—Yes.

Did you go again, a fifth time?—Yes.

That was the same prescription?—Yes.

Did you seal up those bottles the same as the others?—I did.

What did you do with them afterwards?—I handed them over to the analyst.

What is his name?—Mr. Eastes.

In what condition were they when you handed them over?—Sealed.

You say you sealed them all?—

The Judge: You did not ask her if she sealed them on each occasion. You only asked her as to the first and last occasions.

Mr. Grey: No, because she said she had done the same thing on each occasion.

Cross-examined by Mr. Richards: How long have you been doing this work for the Pharmaceutical Society, Mrs. Partridge?—The first time I made a purchase for them was about twelve months ago.

Is your husband connected with that body?—He has made purchases for them at times.

Why do you call him a commission agent?—Because he has several agencies for cattle food, and for Devonshire cider.

You know that some weed killer has been held to be a poison. Have you been buying any of that?—I have not.

Were you the lady who bought the poisons when Mr. Mundy paid the penalties some time ago?—I made one purchase.

Who sent you definitely on June 1 to this shop?—A representative of the Pharmaceutical Society.

I want to know his name?—Mr. Moon.

Do you know what office Mr. Moon holds?—He is an officer of the Pharmaceutical Society.

Did he give you this prescription marked "Mrs. Munro's little boy"?—No.

Who put on this prescription "Mrs. Munro's little boy"?—The person who wrote the prescription.

Who was that?—I do not know his name. He is a chemist.

Is he a chemist in Hackney?—Yes.

Where was this prescription written?—I do not know.

Was it given to you by the person who wrote it, or by Mr. Moon?—No, it was not given to me by the person who wrote it, or by Mr. Moon.

Then how do you know it was written by a chemist in Hackney?—My husband obtained it from a chemist in Hackney.

When you went into the shop on the first occasion you saw Mr. Mundy?—Yes.

Did you see him write in the prescription book before he proceeded to dispense the medicine?—I did not see him writing, but he was at the desk.

Did he not say to you that he could not give you tincture of opium, but that he could give you tincture of lobelia?—No, nothing of the kind was said.

Was anything said?—No.

Do you swear that?—I do.

Was there no conversation at all?—He said it would take some time to make it up; would I wait or call again.

What did you say?—I said I would call again.

I put it to you that he said to you that he could not dispense tincture of opium, but he would give you tincture of lobelia, which was the same thing?—Nothing of the kind whatever.

Did you bring an old bottle to the shop?—No.

They were fresh bottles on each occasion?—Yes.

That you are quite certain about that?—Quite certain.

I put it to you that on the first occasion you brought one of these bottles to the shop?—No, I did not.

Your husband gave you the prescription; when, in the morning?—In the afternoon.

At Brixton or at Hackney?—At Hackney.

Where?—Just outside the defendant's shop.

Did he bring it out from an adjoining chemist's, Mr. Harley's shop?—No.

Did you go with your husband into a chemist's shop in Hackney after you got the prescription?—He accompanied me to Hackney. We walked about Hackney.

After you had got your two bottles on June 1 where did you meet your husband after you came out of the shop?—A few doors from the defendant's shop.

Did you not go then to a chemist's in Hackney?—No.

Where did you go then?—We went to Leighton, in Essex.

On the same business?—No, to visit some friends.

What did you do with the two bottles after you brought them out of the shop?—Kept them in my coat pocket.

You went to your friends, and, I suppose, had some tea?—No.

Nor supper?—No.

You came back all the way to Brixton without any refreshment of any kind?—No.

When you got back to Brixton what did you do with the two bottles?—I sealed them.

You did, or your husband?—I did, in my husband's presence. I kept them upstairs in my room, locked up.

When were they handed to Mr. Eastes?—On July 9.

I suppose at that time you had got all these ten bottles together?—Yes.

Is your husband here?—Yes.

Is he going to be called?—I have not heard.

Will you take your oath that you sealed each of these bottles on the same day that you took them away from Mr. Mundy's shop?—I will.

The next time you went was on June 12?—Yes.

You perfectly recollect that nothing was said about the substitution of something for tincture of opium?—Nothing whatever.

Who sent you on the 12th?—I had instructions to make so many purchases. I went when I felt inclined.

Mr. Mundy's shop was not the only one you visited?

The Judge: Were you directed to get five specimens from Mundy?—Yes.

By Mr. Moon?—Yes. I went when it was convenient to myself.

The Judge: I suppose you considered that that was enough for a few days for Mrs. Munro's little boy.

Mr. Richards: I want to know whether your husband went with you on any other occasion?—Yes.

On each occasion?—No.

On which occasion?—The 23rd.

As a matter of fact, when he went with you was he not waiting for you in an adjacent chemist's shop?—No.

Have you ever gone into a chemist's shop when you were going to make these purchases?—Yes; Mr. Watson's.

Were you going to take proceedings against that unfortunate man?—The Pharmaceutical Society must decide that, sir.

I put it to you that you went to a chemist's shop near, who is a member of the Pharmaceutical Society, and that that used to be the trysting place of you and your husband; do you deny that?—I do.

Did you not go to Mr. Harley's shop on any of these occasions?—No. I have been there.

Were you there on June 1?—No.

On the 12th?—No.

On the 23rd?—I might have been, but I cannot remember. I went there to have two teeth extracted.

That, of course, would make a lasting remembrance on anybody, having their teeth taken out by a chemist?—He was a dentist as well.

You say you kept these bottles in your house from June 1 to July 9?—Yes.

Will you swear that on each occasion they were sealed on the day you brought them home?—I will.

Mr. Grey: I may say Mr. Partridge is here if my

friend wants to ask him any questions. I do not propose to call him, as he does not carry the case any farther.

Mr. Richards: I do not wish to see him unless my friend puts him in the box.

Mr. Ernest John Eastes, examined by Mr. Grey:—Are you an analyst?—I am.

A Fellow of the Institute of Chemistry and assistant to Professor Attfield?—Yes.

Did you receive from the last witness the bottles that have been put in?—I did.

How many were there altogether?—There were ten in all.

In what condition were they?—They were sealed.

Were they also marked?—Yes, with the dates of purchase.

Taking the first two bottles—June 1—what did you do with them?—I analysed them.

Tell his Honour the result of that analysis—first, as to the liniment?—I found it to contain, amongst other constituents, opium.

How much?—I did not take the quantity, but there was a considerable amount.

Did you see the prescription?—I did.

Was the liniment made according to the prescription?—To the best of my belief it was.

Did you also analyse the other bottle—the medicine?—Yes.

Did you see the prescription of that?—I did.

Was it made in accordance with the prescription?

—I cannot say with regard to all the ingredients; I only analysed for one ingredient. I searched and found morphine.

What is morphine?—The chief constituent of opium. I was not able to determine if the morphine were introduced as a preparation of opium or a preparation of morphine.

Morphine is the principal alkaloid?—Yes, it is the alkaloid to which the toxic effects of opium are chiefly due. The small amount, and the presence of the other ingredients, interfered with testing for the other constituents of opium.

Did you then analyse the other bottles in turn? Take the second bottle, June 12, the liniment?—Yes.

Did you analyse that?—I did.

What did you find that contain?—It was similar to the last, and in this one I determined the actual amount of morphine.

How much was that?—There was three-fifths of a grain.

Have you analysed all the other bottles of liniment?—I have.

Have you compared them with each other?—I have. They all contain opium.

Have you compared the other bottles of medicine?—I have not examined them so fully.

The one you did examine you tell us did contain morphine?—Yes.

With regard to the liniment, can you tell us its toxic qualities?—I am not a medical man, but I should say there was enough to kill a man in certain circumstances.

The Judge: That is, three-fifths of a grain would kill a man in certain circumstances?—Three-fifths of a grain of morphine is equal to six grains of opium, and I think that is more than sufficient to kill a man.

Cross-examined by Mr. Richards: Would you mind looking at the prescription, and telling me as to the bottle of June 12, in which you say there is three-fifths of a grain, what does the prescription say?—The prescription says half an ounce of liniment of opium.

How many grains of opium would that be?—It would be 8 grains of opium.

Are you acquainted with tincture of lobelia?—Yes.

Did you test for that at all?—I did not.

Would that have escaped your notice in the analysis?—Probably.

May I ask what is lobelia?—It is a poisonous herb.

What results have lobelia similar to opium?—That is a question more for a medical man than for me.

Lobelia you say is a poisonous herb?—It is a poison, and I believe is generally a sedative.

I put it to you that had you tested for that all this which you have described as morphine might have been lobelia?—No.

Will you swear that?—Yes.

Why?—Because the characteristics of morphine are very distinct.

You say there must have been either morphine *per se* or opium *per se*, is that it?—In this liniment there is a preparation of opium. I say that because I find meconic acid; that is an acid that is only found in opium and poppies. I believe it has been held that the presence of meconic acid proves the presence of opium.

I take it that as to the bottle marked June 1 you will not pledge your opinion as to the amount, but you said to the best of your belief you found opium in the bottle?—I know I found opium.

The Judge: That which was supplied on the 12th was the second analysis, he said, and then he found it necessary to ascertain the quantity.

Mr. Richards: You did not get the bottle till July?—I got none of the bottles till July 9.

And you tested them all one after the other?—I tested the first bottle in July.

The Judge: He has examined all the liniments.

Mr. Richards: Tell his Honour what amount of tincture of opium is in the prescription for the medicine?—Twenty minims.

You will not swear upon your oath that they do contain opium?—I will not swear as to the other four.

Would it be possible to have opium in an old bottle, which, when refilled, would still leave its trace?—It would leave a trace, but then I have found very much more than a trace.

You do not think that in any way you could mistake lobelia for opium?—No.

Give me your reasons?—Because the tests for morphine are very characteristic; also the process of isolation would exclude other ingredients.

Have you used what are called qualitative tests?—I used several qualitative tests.

The purchase of June 12 is the only one you have used the double test for?—That is the only one I have examined quantitatively.

As to June 16, 23, and 29, do you say they all contain opium?—Yes.

In what quantity?—In sufficient proportion to say that I believe they are prepared in accordance with what is stated on the prescription.

Have these bottles been in your possession since July 9?—Yes.

I suppose you were only acting on instructions in refusing to allow our analyst to see them until yesterday?—They were not asked for until yesterday.

Did not the solicitor come to you, and seek to obtain one of the bottles for the purpose of analysis?—No.

Re-examined by Mr. Grey: You have some of the morphine, the result of the analysis, with you?—Yes.

Could you have obtained that if there had been lobelia only?—It would be impossible.

The Judge: I assume Mr. Richards admits that the defendant is not qualified?

Mr. Richards : Certainly, because on the last occasion he paid the £10.

The Judge : I should like to see Mr. Partridge.

Mr. John Partridge examined by the Judge : Where did you get that prescription ?—From Mr. Fitch, of Hackney. He is the district secretary for the Pharmaceutical Society.

What is the history of this prescription ? I see it has been made up by different chemists ?—I had it stamped by the other chemists whose names you see on it.

They went through the ceremony of stamping this ?—Yes.

Mr. Hill, of Hackney, pretended that he had made it up ?—Yes.

Then Mr. Chipps, he did the same thing ?—Yes.

Are they members of the Pharmaceutical Society ?—I believe so.

Did they do it to please you ?—It was sent out by Mr. Fitch to those other chemists to get it stamped.

Did you do that before you took it to Mr. Mundy ?—I handed it to my wife.

Was it stamped by these chemists in Hackney before you handed it to your wife ?—The same day.

Mr. Grey : That is my case.

Mr. William Frederick Mundy, examined by Mr. Richards : You have been in the employment of the Empire Drug Company for some time ?—Yes.

You were there at the periods detailed by the witnesses in the box ?—Yes.

On a previous occasion I believe the Pharmaceutical Society took action against you ?—They did.

On that occasion you paid the money and did not defend, because you knew you had broken the law ?—Yes.

I need hardly ask you, you were more careful after that ?—Very much so.

Do you remember this lady coming into your shop and bringing the prescription ?—Yes.

What passed ?—There is a desk in the shop, and I was standing at the desk copying the prescription. Mrs. Partridge was at the counter. I said to her, "We cannot supply opium, as opium is ordered in the prescription, but I can put something into the mixture that will answer the same purpose." She said, "That will do."

That you swear ?—Yes.

Why could you not supply opium ?—Because it is in the schedule to the Act, and would be contrary to the law. Then I also mentioned that there was opium in the liniment. I said, "I will omit that, because I cannot supply it." She said, "I will leave it to you to make up."

Did you enter the prescription in the book ?—Yes. In the margin it says : "Tincture lobelia"—"omitted by consent"; and as regards the liniment it says : "omitted by consent." And after "opium" is "Lin. Sap.," standing for liniment saponis.

Did you on any of those occasions put in any tincture of opium ?—No.

That you swear ?—Yes.

What did you put in besides lobelia ?—In the case of the liniment I put soap liniment.

The Judge : Then in no case is there any opium ?—No.

Mr. Richards : It is a matter of perjury on one side or the other. I produce the book, and challenge a perusal.

The Judge : What is "s.v." ?—That means without the bottle.

Mr. Richards : On one occasion she says she paid 10d., and on another 11d. ; how was that ?—I was under the impression that the first time she brought her own bottle, and then I charged her 10d. ; on subsequent occasions I supplied the bottle, and then I charged her 11d.

When she came the second time did you make any observation to her beyond the ordinary "good morning" ?—Yes, I did. I said : "Shall I make it up as before without the opium ?" and she said "yes."

You were perfectly well aware, Mr. Mundy, that the Pharmaceutical Society was looking about in Hackney ?—Certainly, and I was refusing poison every day, and have good reason to believe that many of the people who came in to ask for it came from the chemist's next door but one, for I watched them.

Did you ever see Mr. Partridge ?—I do not recollect seeing him.

Of course you remember Mrs. Partridge ?—Very well—distinctly.

You say that you were fully aware of the Pharmaceutical Society being in the neighbourhood ?—Yes.

And you fully understood your position, and you pledge your oath that on neither occasion did you put any opium into either of the mixtures ?—Yes, I do.

Cross-examined by Mr. Grey : You are the managing director of the Company ?—Yes.

What is it ?—It is a limited company registered under the Companies Acts.

Who registered it ?—I registered it.

Were any shares subscribed for ?—Oh, yes.

How many ?—I really cannot say without seeing the books.

Were there eighty-four shares subscribed for, of which you hold fifty ?—I did hold fifty.

You are the only person who looks after the business ?—I was at one time.

Mr. Richards : We have not denied that he was there when you bought this.

The Judge : You have parted with some of your shares ?—Yes.

When ?—Some time ago. I was seeking to leave the business altogether. It would be about August, I should say.

Mr. Grey : Who are the other shareholders ?—There are six others. Two are commercial travellers. Was it registered to carry on the business of chemists and druggists ?—I believe it is.

Had you any qualified man on the premises ?—Yes.

What is his name ?—The present one ?

No, at the time these purchases were made ?—No, I had not then.

Did you make up any prescriptions that were brought in ?

Mr. Richards : Now, sir, is the witness bound to incriminate himself ?

Mr. Grey : It is not to incriminate him at all.

Mr. Richards : If you say that I withdraw my objection.

The Judge : I do not see the use of asking it. You rely upon this case of Wheelton.

Mr. Grey : Yes. You say in this prescription that was brought to you there was liniment of opium ?—Yes.

You heard the evidence of Mrs. Partridge and of the analyst ?—Yes.

Do you swear that that conversation passed with Mrs. Partridge with regard to lobelia—that you could not supply any opium, and that you would put in lobelia instead ?—No, I did not say that. I said I could not supply any opium, but that I would put in something else.

What did you put in ?—Tincture of lobelia.

You heard Mr. Eastes say that there was opium in that liniment ?—Yes.

As is seen on this prescription ?—I heard him say there was opium, not as seen on the prescription.

The Judge : He said he thought the liniment had been made up in pursuance of the prescription.

Mr. Grey: Do I understand you to represent that you did not put any opium into the liniment?—None whatever.

What is that dark fluid in the liniment?—That is burnt sugar.

Then in the liniment what did you put instead of the liniment of opium?—Soap liniment.

Soap liniment is included in the liniment of opium?—Yes, I believe it is; that is how it is made.

Therefore there was opium in the liniment?—Certainly not.

The Judge: There is no opium in soap liniment, but you cannot make opium liniment without soap liniment.

Mr. Grey: Liniment of opium comprises soap liniment and tincture of opium.

The Judge: You have only to put in a similar quantity of soap liniment instead of opium liniment?—That is what I did.

Mr. Grey: Do you say the analyst could have found any opium in that bottle if you had put none in?—He might have found it if somebody else put it in.

Do you say anybody interfered with that bottle?—I have no evidence of that.

Do you say that Mrs. Partridge or anybody else—

The Judge: He says he does not know; he has no evidence of it.

When you got this prescription you said, "I cannot put in the tincture of opium"?—Yes.

Did you discuss with her lobelia?—No; I simply said I could not supply the opium, but I would put in something which would answer the same purpose. You did not tell her what?—No.

What is the effect of lobelia?—It acts as a mild sedative as far as I have had experience.

Did you put more in?—No, the same quantity.

She said she would leave it to you?—Yes.

This was before you began copying the prescription into the book?—Before I had anything to do with that I explained it to her.

When did you copy it into the book, before or after you compounded it?—Before.

When you began copying it into the book she had consented to something in the place of the tincture of opium, and something in the place of the opium liniment?—Yes.

Why did you enter in the book the words "tincture of opium"?—It is the custom to copy a prescription the same as it is written.

Did you write these marginal notes at the same time?—Yes, at the same time.

Look at the "omitted by consent"; how is it the "lin. sap." is crowded up?—I do not mean that I put that in at the time of copying, but after the prescription was copied then I put in the price and these other marks.

Then what you said before was not quite accurate?—I did not quite gather what you intended.

Re-examined by Mr. Richards: The words written in substitution were written while she was in the shop?—Yes.

Written before you delivered to her the prescription?—Yes, when the prescription is copied the price is usually filled in, which I did.

Mr. Richards: This, your Honour, is a matter of the greatest concern to my client, and I need hardly say, as his counsel, that I fully saw the position, when I read my brief, that I must take in this matter if my client's instructions were true and accurate, and he was prepared to substantiate them on oath—that someone had been behaving dishonourably in the matter. The best proof that this man knows the law is that, when on a previous occasion he was summoned,

he employed neither solicitor nor counsel, but very wisely paid the money into court. Of course he then learnt the lesson that the Pharmaceutical Society had an eye upon him, because, of course, he keeps a drug store that supplies goods at a cheaper rate than other chemists. I dare say you are aware that Spiers and Pond have to put at the bottom of their bottles, "Dispensed by So-and-so, who is a licensed chemist." Now, my client had not at the time a qualified assistant on the premises. He tells you that day by day he was refusing to sell poisons because he knew of the action of the Society, and he believed the people who asked for them were sent by a chemist a few yards off. Now take the history of the Partridges. Mrs. Partridge gets the prescription from Mr. Moon, and it is clear that Mr. Partridge is also in Hackney.

Mr. Grey: She never said she got the prescription from Mr. Moon. She had instructions from Mr. Moon, but nothing to do with the prescription at all.

Mr. Richards: These people were on the war-path. They were acting the despicable part of agents trying to induce people to break the law. Now they get these bottles in their possession on dates varying from June 1 to June 29. No doubt you are perfectly well aware of the procedure under the Adulteration of Foods Acts, and the same with regard to spirits, and that sort of thing.

The Judge: No, I am not.

Mr. Richards: I have appeared for defendants who are accused of adulteration, and there the things are sealed up in their presence, and a portion is taken away for analysis, and a portion is left with them, so careful is the law where criminal proceedings are taken. I am not saying that the Act here requires that to be done, but here you have a conflict of testimony between two persons, one—I speak with every sympathy for the lady in the box—acting under the direction of her husband, and going into this shop and into that shop—I say they have got to get a conviction. They know that unless there can be a proof on their evidence that poisons specified in the schedule have been sold their mode of livelihood is gone. I put it to you, is it fair that with these bottles—she says sealed up—there is only her evidence against my client's—is it fair that with these bottles sealed up they should be thirty-nine days before they are submitted to analysis? What is more easy than to get up a prosecution of this character when we find that respectable professional men, as I thought chemists were—but I am afraid I must withdraw that remark after this—have the audacity, for the purpose of entrapping persons into fines and penalties, to put their mark on a prescription when they have not made it up? I only trust that your remarks will be noted—and I have no doubt they will, as I see members of the press here, no doubt representatives of trade journals—that members of a profession should condescend to do what would be absolute fraud upon the part of a solicitor or a barrister, if they were to let an opinion go out which was not their's with their signature upon it. You are sitting here as a judge and jury. You are in the position of five or twelve men who are called upon to convict for a criminal offence. You call my attention to the fact that you have not practised in the criminal courts, but I suppose you are perfectly well aware that over and over again a judge in a criminal court will tell the jury that unless the prosecution have made out the case to their satisfaction, and if there is any reasonable doubt in their minds, the prisoner is entitled to it. I say my client stands in that position. He stands very much in the same position as a man brought before a magistrate for an offence under the Adulteration Acts, which, is

a criminal proceeding; this is to all intents and purposes a criminal proceeding, although the law permits it to be brought in the county court. I say the persons who bring these proceedings have to establish their case the same as any prosecutor—without any reasonable doubt. It is the balance of two peoples' word; it is the balance of the woman's word against the defendant's, against a defendant who knows the position he is in—who knows if you find against him that in addition to the penalty you will be convicting him of an offence. I put it to you, as this is in the nature of a criminal proceeding, you cannot take one person's word against another's, without any confirmatory evidence that those bottles were kept for those thirty-nine days apart from any chance of having put into them one drop of opium, which would be more than sufficient to give those results which Mr. Eastes described. I am not attacking the analyst for a moment. I believe he is a gentleman of well-known professional ability, and upon him I cast no shadow of doubt whatever. I put it to you that this case has not been substantiated by the one witness, tainted as she might be in the method in which she is sent to work by her husband, and with the knowledge that this man has already been convicted and paid his fine—that it was not likely that he would risk the law once more, and he actually marked his book with a statement which, if you believe that woman's evidence, was utterly untrue. What more likely than that she did forget that she said he was to put in what he liked. When she came on the other occasions she said it had done very well.

Mr. Grey: That was never in evidence.

Mr. Richards: I put it to you, sir, that you must in this case be more than ordinarily circumspect in receiving the evidence.

Mr. Grey: I should like to say just a few words after the extraordinary remarks that have been made by my learned friend, the reason for which, no doubt, is to be found in the fact, to use his own words, that there are members of the press present. I submit that purely prejudicial remarks have nothing whatever to do with this case. What has to be proved before you to-day is, whether poison was sold on these occasions contrary to the Act? You have had before you Mrs. Partridge, who made those purchases on each occasion. She gave the prescription to the defendant, who, according to his account, did not give her what she asked for—that is to say, he supplied a substance which was not according to the prescription, because in the liniment, according to his own account, there was absolutely nothing put in the place of the liniment of opium but burnt sugar. I am sorry if that is the way he dispenses the prescriptions brought to him: The analyst was called before you, and he proves, as I submit without doubt, that in each of these bottles of liniment he found a preparation of opium, and in a very dangerous quantity. If you believe Mr. Eastes, that evidence, I submit, decides this case. True, my friend wishes you to believe that Mrs. Partridge on every occasion put into each bottle of the liniment and each bottle of the medicine a certain amount of opium, for she must have done it for Mr. Eastes to have discovered opium in it. It must be that, or it comes to nothing. Not only that, but the quantity put in must have been equivalent to the quantity in the prescription, as Mr. Eastes finds it. That is to say, into each bottle was carefully measured out half a fluid ounce of liniment of opium, and the bottle sealed up. I ask you to say that could not be so. With regard to the penalties, the Society is bound to see that the Act is rigidly enforced. It is the body deputed by the Legislature to stop unqualified persons selling poisons. What is the defendant in this

case? The defendant is the managing director, according to his own account, of the Empire Drug Stores. He possessed fifty shares out of the eighty-four subscribed.

The Judge: He has not got them now.

Mr. Grey: He omits to employ any qualified man to sell the poisons. He himself is in the shop and makes up the prescriptions in a way which, according to what he has told us to-day, must be a very careless manner. As late as December last he was sued by the Pharmaceutical Society for two penalties. He paid up, as his learned counsel says, and one would have thought that would have been sufficient to induce him to stop it. That is the reason why the five penalties are sued for to-day—because he does not care about two penalties; they are not sufficient. We are suing to-day for five penalties in the hope that it will prevent him going further, and teach him a lesson in future.

Judgment.

The Judge: In this case the plaintiff Society sues for penalties under the Act, against Mr. Mundy, for having compounded liniment with opium in it. Now this is either one of the most wicked conspiracies on the part of the two Partridges to do a man an injury in order to earn their commission, or it is a true case. I have heard the evidence, and I have seen the prescription book, and unless I can arrive at the conclusion that Mrs. Partridge, or someone on her behalf, has tampered with the medicine she has got from Mr. Mundy, I must arrive at the conclusion that Mr. Mundy is liable to the penalties. Her evidence is unshaken. Of course there is obloquy attaching to her of being an informer, but that has nothing to do with the evidence I have to deal with. She tells her story as to how she bought the medicines, and she is unshaken in cross-examination. The only defence to that is an insinuation—a suggestion entirely without evidence to support it—that, having this made up in a way that Mr. Mundy said it was made up, these two people, either Partridge and his wife, or one or the other of them, has taken it and mixed in it the opium prescribed by the Act for the purpose of earning their commission. I say there is not the slightest evidence in support of that. She seems a decent woman, and gave her evidence in a most straightforward way. I suppose it is not easy to buy laudanum and deal with it in the manner so that you could put it in a prescription. I am not certain as to that, so the evidence stands for the plaintiff. There is laudanum in it. Then we come to the defence. There is the statement of the defendant that he said "I cannot use opium, therefore I will put you in something else—lobelia," and then when we come to the liniment, as to which the evidence of the presence of poison is stronger, that he said "I will put in soap liniment, and that will do as well." There is a mysterious entry in the book which looks to me like an after thought, but I do not decide the case upon it. There is this remark to be made: If, as a matter of fact, Mr. Mundy had said to this woman, "I can use soap liniment, but I cannot use opium liniment," what reason in the world was there for putting in the burnt sugar, unless, perhaps, it was that this prescription had been made up before, and therefore the persons who wanted it for the little child for whom it was to be used would have said—it is not brown, as it should have been. On the whole of the evidence I cannot but arrive at the conclusion that Mr. Mundy has committed a breach of the Act, and must pay the penalties. There will be judgment for the full amount. I have no option.

Mr. Grey: I ask for costs on the higher scale.

The Judge: Very well.

POISONING CASES AND INQUESTS.

A CHILD POISONED BY LAUDANUM.

On October 5, at the Grove Inn, Daybrook, the District Coroner (Mr. D. Whittingham) conducted an inquiry into the circumstances attending the death of Harriett Bell, aged ten months, daughter of William H. Bell, collier, of Daybrook. The child was found dead in bed on Thursday morning. It was in good health when it was put to bed the previous night. The coroner said it had been suggested to him that the mother had been in the habit of giving the child laudanum, and he had instructed Dr. Stenhouse to make a post-mortem examination.

Hannah Bell said she was the mother of the deceased child. Witness found the child dead in bed on Thursday morning. Since the child's birth she had been in the habit of giving it laudanum. The neighbours had advised her to give this to the child, as it was troubled with diarrhoea. One pennyworth of laudanum would last for over a week. She gave the child a dose of three or four drops on Wednesday night. Witness had been to Hucknall on Wednesday, and came home about five o'clock in the afternoon. The child was insured in the Refuge Office, the money to be paid at death. She did not tell the insurance agent that she gave the child laudanum every night, and was not cautioned by him about it.

Dr. Stenhouse said he had made a post-mortem examination of the body of the child. There were marks of discolouration on the right side—the side on which it had lain—and there were marks of discolouration across the mouth. The brain was severely congested. He was of opinion that death was due to coma, or insensibility, a condition such as would be caused by an overdose of laudanum, and which in his opinion was aggravated by partial suffocation.

In summing up the Coroner said the system of giving young children laudanum was one that prevailed to a very large extent. He was of opinion that the time had come when there should be further legislation as to the selling of laudanum and opium. Any person at the present time could obtain small quantities by going to a qualified chemist, with very little difficulty. There were certain poisons that could not be had without a witness. If this was any protection at all he thought it ought to be made applicable to the case of laudanum. The Coroner, having strongly condemned the system of insurance whereby money was obtained at death, said that he could not help thinking that the woman came to the conclusion that the child had been poisoned, as she at once got the bottle out of the way. If the jury were of opinion that the mother of the child gave it laudanum in order to end its days it would be a case of wilful murder. If she gave it recklessly and with utter indifference, with gross and culpable neglect, she would be guilty of manslaughter, but if, on the other hand, the jury considered that the laudanum was given out of ignorance, they would return a verdict that it was the result of misadventure.

The jury returned a verdict in accordance with the medical evidence, adding that they thought the laudanum was given in ignorance. The mother was then called into the room, and was censured by the Coroner, who said that he hoped this case would be a warning to people there and elsewhere not to traffic with the lives of children.—*Nottingham Daily Express*.

POISONING BY AN OVERDOSE OF CHLOROFORM.

Mr. John Troutbeck held an inquest at St. Martin's Vestry Hall, Charing Cross, on October 8, upon the body of Mr. G. H. Penruddocke, aged 23 years, lately living at Baverstock, Salisbury, of independent means,

who was found dead in his bed-room at the Craven Hotel, Craven Street, Strand, on Thursday. The Rev. W. F. Penruddocke, clerk in holy orders, of Brompton Road, St. John's Wood, identified the deceased as his brother, whom he last saw alive a fortnight ago. He had no cause to commit suicide, but was in the habit of taking chloroform to relieve pain. Dr. John Lough of Charing Cross Hospital, said he attended the deceased on his admission to the hospital, and he appeared to be suffering from the effects of a poison. Witness was handed a bottle which had contained chloroform. The post-mortem examination showed that death was due to poisoning from chloroform, and witness arrived at the conclusion that the deceased had drunk from one to two half ounces of chloroform. One ounce was a fatal dose. Mr. J. Reynolds, assistant to a chemist, said on Tuesday evening the deceased came to the shop with a properly labelled bottle, and asked for one ounce of chloroform, stating that he wanted it for moths and butterflies. The deceased was sold one ounce of chloroform. The jury returned an open verdict.—*Standard*.

POISONING BY CHLORODYNE.

Mr. G. E. Hillman, Coroner for East Sussex, held an inquest on October 11, at the Cuckfield Union Workhouse, on the body of a man unknown, found on the previous Tuesday in a dying condition upon Haywards Heath.

Peter P. Parsons said he found the man lying on his right side. Witness tried to rouse him, but he seemed to want to go to sleep. Witness found the three empty chlorodyne bottles and glass produced lying about two feet from deceased.

Dr. C. Neate, of Haywards Heath, said he was called to see deceased. He was in a complete stupor, totally insensible. Witness noticed distinctly the odour of chlorodyne, and attributed the condition of the man to narcotic poisoning.

Dr. A. E. Wells, of Cuckfield, said the post-mortem examination showed the stomach much congested and inflamed, indicating irritant poisoning in addition to narcotic. He attributed death to poisoning by chlorodyne. He was of opinion that a large quantity of chlorodyne had been taken, probably over two ounces.

The jury returned a verdict "That deceased committed suicide, but there was no evidence to show the state of his mind."—*Sussex Daily News*.

CASE OF MORPHINE POISONING.

An inquest was held on October 11, at 14, Ennismore Gardens, South Kensington, the residence of the late Captain Augustus William Travers, formerly of the 5th Dragoon Guards, as to the death of the captain from an overdose of morphine. Mr. Arthur Hope Travers, son of the deceased gentleman, said his father had been in the habit for the last six years of taking drugs to induce sleep; and Mr. Taylor, a chemist's assistant in Cromwell Place, said he had occasionally sold the captain morphine, and also bromide of potassium, which he took in large doses as a sedative. Dr. Pedlar, of Trevor Terrace, said the deceased had a fatty and weak heart, and a small dose of morphine might prove fatal under those circumstances. Other evidence was given that Captain Travers was negotiating for the tenancy of another house, and that there was no apparent motive for the suicide. The jury gave a verdict of "Accidental death."—*Morning*.

POISONING BY POTASSIUM CYANIDE.

On October 11, an inquest was held concerning the death of the infant son of a Willesden photographer named Maxwell. Maxwell told the jury that he had been out of regular employment for fourteen months, and was doing a little at home. He was developing

two negatives, and while his back was turned the child drank some cyanide of potassium which was standing on a tray, and died in less than a quarter of an hour. Witness was very particular with chemicals, and always kept them in a locked cupboard. The child had followed his mother to the front door, and Mrs. Maxwell said she was speaking there, and did not notice the boy's return to the room. Coroner Hogg: It seems a little absent-minded to be talking to people with children and deadly poison about. A verdict of "accidental death" was returned.—*Morning Leader*.

SUICIDE BY CARBOLIC ACID.

At an inquest held at Wrexham last week on the death of a young man, named John Jones, who was proved to have taken a quantity of carbolio acid, the jury found that the deceased died of carbolio acid, taken while he was of unsound mind, adding as a rider they were of opinion that some restriction ought to be put on the sale of such virulent poison, and expressing their sympathy with the family of the young man in their trouble.—*Wrexham Advertiser*.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACT.

SALE OF LAUDANUM DEFICIENT IN SPIRIT.

Before the Bradford Borough Bench, on October 1, Arthur John Powell, chemist, of Stanningley, was summoned for selling laudanum not of the statutory quality. Mr. Quinlan, the inspector, deposed to purchasing an ounce of laudanum from defendant's wife, and subsequently four ounces, which defendant wanted to take out of another bottle, but witness insisted upon its coming from the same one. The laudanum was found to be 38 degrees under proof strength. Mr. C. L. Atkinson, in defence, asked that the sample should be sent to Somerset House, and a long hearing ensued. In the end the Bench expressed themselves as quite satisfied the laudanum was not what was asked for, and they fined the defendant 5s. and costs.—*Bradford Argus*.

TINCTURE OF SENNA, AND SULPHUR SOAP.

On October 14, John Charles Meacher, chemist, of Seven Sisters Road and Stroud Green Road, was summoned by Mr. A. L. Bridge, an inspector of the Middlesex County Council, under the Adulteration of Food and Drugs Act, for selling a drug, to wit, tincture of senna, containing only one-half of the extractive matter of the tincture of senna of the British Pharmacopoeia, and also deficient in spirit to the extent of 20 per cent. Defendant was also summoned for selling sulphur soap which contained no sulphur. The cases were taken separately. Mr. A. N. Forbes appeared in support of the summonses for the Middlesex County Council. On the senna case the defendant was represented by Mr. Lewis Thomas, barrister; on the sulphur soap case the defendant was defended by Mr. Ruegg, barrister. Mr. Bridge proved the purchase of the tincture of senna at the Seven Sisters Road shop on September 15. Mr. Edward Bevan, public analyst for Middlesex, said in cross-examination that there was no standard for tincture of senna mentioned in the British Pharmacopoeia (*sic*). Mr. Lewis Thomas, in defence, said that there had been an evaporation of the spirit contained in the tincture. Mr. Bevan said he had allowed for this. Mr. Lewis Thomas said that the drug was supplied by Messrs. Langton, the wholesale druggists, of Finsbury, and sold as purchased. The defendant said that tincture of senna was not asked for once in six months. Mr. Herbert Collins, described as a pharmaceutical chemist, said that not only was there no standard for tincture of senna, but Professor

Atfield and other eminent chemists had said that the weaker the spirit the more effective the drug. Mr. Lane said that this was a very startling proposition. He fined the defendant 10s., with £1 16s. costs. In the soap case Mr. Forbes said that the prosecution held that sulphur soap was a drug. Mr. Ruegg laughed. Mr. Lane: Why should not sulphur soap be a drug if it is used for skin disease? Mr. Bridge said that he made the purchase on September 18, and the assistant said, "If there is no sulphur in it, Fraser's will have to answer for it." Cross-examined: He was not put up to get the soap by a rival manufacturer. He expected to find sulphur in the soap, as he would expect to find honey in honey soap. Mr. Ruegg said that with each tablet of soap Fraser's issued a notice which said that the soap was not sold as a curative soap, but it was recommended to persons who suffered from skin diseases. Mr. Lane saw the sample, and said that it looked like an ordinary toilet soap. Mr. Bridge said the sample was not accompanied by the paper Mr. Ruegg had produced, but it did contain a paper recommending the medicinal qualities of sulphur tablets. Mr. Lane said that to make it a drug it would be necessary for the prosecution to prove that sulphur soap was generally used for curative purposes. Mr. Bevan, the analyst, said it was extremely probable that all the sulphur had worked into another portion of the soap while in process of manufacture. He analysed a third of a tablet. Mr. Lane said that the prosecution had failed to prove that sulphur soap was a drug any more than tar soap was a drug. He therefore dismissed the summons. Mr. Ruegg said he was instructed to state that his clients had an answer to the case on its merits.—*Morning Advertiser*.

Correspondence.

SALE OF PROPRIETARY MEDICINES

Sir,—Attention has again been drawn in the Journal to the sale of nostrums containing poisons, the article told being Powell's balsam of aniseed. I am not for a moment going to defend Mr. Briggs, but my desire is to draw attention to the statement made by him in defence of having unknowingly sold a medicine containing poison. He is reported to have said, "If you look you will see that it merely states 'Powell's balsam of aniseed.'" Here is a preparation which time after time has been the subject of litigation, and is well known to contain morphine in most varied quantities, and yet the proprietor continues to send it forth without any indication that it contains anything of a poisonous nature, whilst a retailer selling a bottle of it without affixing his own name and address is liable to a penalty. But the difficulty does not cease with this one nostrum, scores of others—syrups, elixirs, lozenges, and pills are in the market, and doubtless in our shops at the present moment, under precisely the same circumstances, only waiting the act of some enterprising friend to bring them into court to our doubtful satisfaction. I am well aware that our esteemed President tells us that "it is the duty of the chemist and druggist to know what he is selling, and that he has no right to sell anything he does not know anything of, and if he does not know, he must either analyse it himself and find out, or object to sell a thing at all which he does not know." Such advice is doubtless good in theory, but practically impossible. The question therefore is, what is the remedy? Beyond a doubt the right and proper remedy is the alteration of the law, whereby the responsibility of making known the fact of any nostrum or patent medicine containing a scheduled poison should rest upon the proprietor, then, and not till then, will it be possible for the retailer fully to carry out the requirements of the Poison Act. I should be sorry to impute unworthy motives to our legal friends, but is it within the range of possibilities that the bare suggestion of such an alteration of the Act vividly brings to their minds the old story of the inexperienced young solicitor who, having succeeded to his father's practice, was some years after asked by his father "How do you get on with Mrs.

So and so's case?" "Oh, I settled that long since," he innocently replied. "What! settled it! Why, my son, I lived upon that case for years." Whether such is the feeling I won't say, but certain it is that as matters are at present the lawyers are making a good living out of the Act. An alternative remedy, however, I venture to think might be adopted by taking a lesson from certain proprietors of popular remedies, who require chemists to sign an undertaking not to sell their nostrums below a given price. Could not chemists in self-defence require proprietors of the multitude of nostrums with which the trade is bored to give the wholesale dealers a guarantee that their preparations do not contain scheduled poisons, and that those which do contain such poisons shall have the fact, with the name of the poison, distinctly printed on the outside wrapper or label? The wholesale dealers on their part affixing a star or other distinguishing mark against such preparations in their catalogues? We should then be in a position effectually to protect ourselves by refusing to stock any preparation not thus guaranteed. I venture to throw out this suggestion with the hope that the subject may be discussed by others in your columns, and some practical conclusion arrived at.

154, Marine Parade, Brighton. EDWIN B. VIZER.

Answers to Correspondents, etc.

"Thymus."—Your determination is correct.

M. Gibson.—Your letter has been submitted to the author of the paper, and in reply it is stated that the latter contains all the information possessed on the subject.

Books, etc., received.

ETHICS IN MEDICINE. By a WEST RIDING PRACTITIONER. Pp. 40. 6d. Leeds: R. Jackson. From the Author.
MEDICAL SPECTACLES. By A. Fournet. Pp. 22. 6d. London: A. Fournet. From the Publisher.

THE NATURAL HISTORY OF PLANTS. By KERNER and OLIVER. Pp. 561 to 672. Illustrated. 2s. 6d. net. London: Blackie and Son. From the Publishers.

A MANUAL OF CHEMISTRY. By ARTHUR P. LUFF, M.D., B.Sc. (Lond.), M.R.C.P. Pp. i-xvi., 1 to 525. Illustrated. 7s. 6d. London: Cassell and Co. From the Publishers.

HANDWÖRTERBUCH DER PHARMACIE. Edited by A. BRETOWSKI. Parts 17 and 18. 2 M. 40 Pf. each part. Vienna and Leipzig: Wilhelm Braumüller. From the Publisher.

EVERYBODY'S POCKET CYCLOPEDIA. By DON LEMON. Pp. 224. 4d. London: London and Universal Bank. From the Publishers.

WATT'S DICTIONARY OF CHEMISTRY. Revised and entirely re-written. By M. M. PATTISON MUIR, M.A., and H. FORSTER MORLEY, M.A., D.Sc., assisted by eminent contributors. Vol. iv., with addenda. Pp. i-xii., and 1 to 922. 63s. London: Longmans and Co. From the Publishers.

RHODOLOGIA. A discourse on Roses and the odour of the Rose. By J. CH. SAWER, F.L.S., Author of "Odorographia." Pp. 98. Brighton: W. J. Smith. From the Author.

PIPERAZINA AND OTHER ELIMINANTS IN THE TREATMENT AND PREVENTION OF GOUT. By E. D. MAPOTHER, M.D., F.R.C.S.I. Pp. 8. Reprinted from the Practitioner. From the Author.

BERICHT VON SCHIMMEL AND Co., Leipzig, October, 1894. Pp. 88. From the Publishers.

HOMOEOPATHY: ALL ABOUT IT; OR THE PRINCIPLE OF CURE. By JOHN H. CLARKE, M.D. Pp. 98. 1s. London: The Homoeopathic Publishing Company. From the Publishers.

TEXT-BOOK OF INORGANIC CHEMISTRY. By G. S. NEWTH, F.I.C., F.C.S. Pp. i-xiii., 1 to 667. 6s. 6d. London: Longmans and Co. From the Publishers.

SPERMIMUM-POEHL IN CHEMISCHER, PHYSIOLOGISCHER UND THERAPEUTISCHER BEZIEHUNG. By Dr. G. BUEHL. Pp. 1 to 84. St. Petersburg: Buchdruckerei von Wienecke. From the Author.

ON THE RELATIONS OF SOME OCCUPATIONS TO EYESIGHT. By SIMON SMELL, F.R.C.S., Ed. Pp. 1 to 16. London: John Ball and Sons. From the Author.

REPORT OF THE PORT OF LONDON SANITARY COMMITTEE AND OF THE MEDICAL OFFICER OF HEALTH FOR THE PORT, to June 30, 1894. Pp. 41. From the Committee.

LIEBIG AND KOPPS' JAHRESBERICHT ÜBER DIE FORTSCHRITTE DER CHEMIE für 1889. Edited by F. FITTICA. Part 6. Pp. 2401-2880. Brunswick: Friedrich Vieweg und Sohn. From the Publishers.

REPORT ON THE HEALTH, SANITARY CONDITION, ETC., OF THE BOROUGH OF HASTINGS, for the quarter ending September 30, 1894. From the Clerk to the Authority.

THE PHYSIOLOGICAL ACTION OF THE NITRITES OF THE PARAFFIN SERIES, CONSIDERED IN CONNECTION WITH THEIR CHEMICAL CONSTITUTION. By J. THEODORE CASH, M.D., F.R.S., and WYNDHAM R. DUNSTAN, M.A. From the Philosophical Transactions of the Royal Society of London. Pp. 135. 7s. London: Kegan Paul, Trench, Trübner, and Co. From the Authors.

WRIGHT'S IMPROVED PHYSICIANS', SURGEONS', AND CONSULTANTS' VISITING LIST, 1895. 5s. 6d. post free. Bristol: John Wright and Co. From the Publishers.

Obituary.

Notice has been received of the death of the following:—

On October 15, Joshua Collitt Smith, Chemist and Druggist, Horbury. (Aged 54.)

On October 15, Francis Thirkettle Silvers, Chemist and Druggist, late of Camberwell Green. (Aged 61.) Mr. Silvers was Divisional Secretary for the Parliamentary Division of Dulwich (Camberwell), and had carried on business in Camberwell for over thirty-seven years, retiring therefrom only about six weeks ago.

Diary of the Week.

SATURDAY, OCTOBER 20.

Pharmaceutical Football Club v. Mount View, at Wormholt Farm, Shepherd's Bush, at 3 p.m.

TUESDAY, OCTOBER 23.

Royal Photographic Society, at 8 p.m.
Technical Meeting at 5a, Pall Mall East.

THURSDAY, OCTOBER 25.

Chemists' Assistants' Association, at 8.30 p.m.
"Chemical and Pharmaceutical Signs and Symbols," by T. Tickle.

Liverpool Chemists' Association, at 7 p.m.
"Some Preparations of the British Pharmacopoeia, with especial reference to the proposed Revision," by R. C. Cowley.

Nottingham and Notts. Chemists' Association, at 8 p.m.
Meeting at the Eagle Restaurant, Long Row:—
"Hindrances to Success," by R. D. Gibbs, President of the Midland Pharm. Association.

"Local Associations and their Federation," by H. Kemp, President of the Federation of Local Chemists' Associations.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bennett, Buck, Callis, Grimaldi, Gibbs, Hardwick, Hill, Hooper, Horn, Irwin, Luff, Meadows, Morley, Morrison, Newsholme, Norman, Perry, Reynolds, Storey, Wiggia, Wilcock, Wright, Viser.

Practical Pharmacognosy.

(Continued from p. 42.)

Systems of Tissue.

LEAVES.

The general morphology of the tissues of the leaf is essentially the same as that of the stem from which it proceeds. In the case of the typical monostelic stem of Phanerogams (*ante*, p. 232), each leaf receives a portion of the stele or central cylinder of the stem. Such portion is termed a "meristele," and may be either entire or split up into a number of "schizosteles." In schizostely the tendency is for the single primitive stele to break up into as many distinct strands as it possesses vascular bundles. Each strand may consist of but little more than a vascular bundle with a pericycle which may consist of parenchyma alone or associated with stereom or supporting tissue (collenchyma or sclerenchyma). The pericycle, generally homogeneous in the root, is usually heterogeneous in the stem and leaf-stalk. This

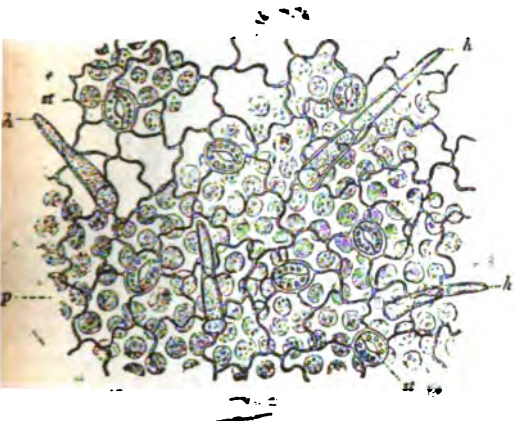


Fig. 27.—Hyoscyamus leaf. Upper epidermis, with cells of palisade tissue, p, showing through; h, hairs; st, stomata. xl50. (Vogl.)

may be due to partial differentiation into collenchyma or fibres which are generally sclerotic, or to the presence of secretory ducts. The chief part of the conjunctive tissue (*ante*, p. 232) of the primitive monostele is necessarily excluded from the schizosteles and becomes part of the extrastelar ground-tissue, each schizostele being invested by a segment of the endodermis or bundle-sheath.

The bundles, which run along the junction of the two forms of tissue generally found in the leaf, diminish in bulk as their ultimate ramifications are traced, the number of the constituent elements being reduced and those that remain becoming smaller. In the Pteridophyta the bundles have only free ends; in the parallel-veined leaves of Monocotyledons the finer branches anastomose with each other to form a close system; and generally among Dicotyledons the finer branches also anastomose, but from the meshes of the network formed the ultimate branches project among the mesophyll-cells as free ends. The free ends of the bundles consist of one or two rows of short racheids with close spiral markings, and no sieve tubes can be traced quite to the extremity,

their place being taken by parenchymatous cells. Bundles also often terminate in connection with glandular tissue (*c.f.* Vine's 'Text-Book of Botany,' pp. 139 and 184).

The internal ground-tissue of the leaf-blade is termed "mesophyll," and consists of thin-walled cells varying in form. In thin leaves the whole mesophyll consists of assimilatory tissue, the cells containing chloroplastids or chlorophyll-bodies, which are capable of producing starch-grains and of constructing organic substance from carbon dioxide and water under the influence of light. Towards the surface of the leaf more directly exposed to light the mesophyll occurs as somewhat elongated cylindrical cells, which form a compact palisade tissue, one or more rows in thickness. The cells below, which are less regular and have large intercellular spaces between them filled with air, constitute the spongy parenchyma, single cells of which frequently contain crystals of oxalate of lime. The transition from the one form of tissue to the other may be gradual. The epidermis varies in consistence according to the number of layers of

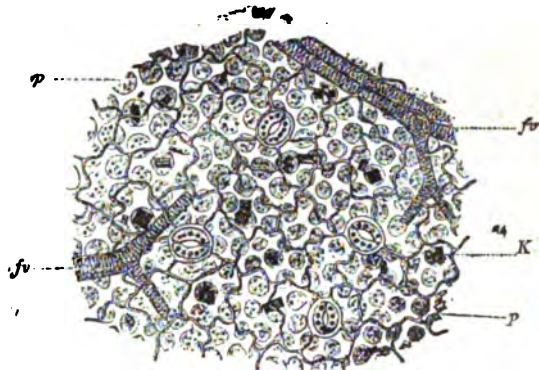


Fig. 28.—Hyoscyamus leaf. Upper epidermis, with, fv, vascular bundles; k, crystal cells; and p, palisade-cells showing through. xl50. (Vogl.)

cells it contains. That of the lower surface of the leaf contains numerous stomata, which afford entrance to air-chambers that communicate with the intercellular spaces. A few stomata occur sometimes on the upper surface, and oil-glands may also impinge upon the epidermis of the upper or under side of the leaf, which is frequently more or less covered with hairs. Fleshy and succulent leaves have assimilatory tissue, consisting either of palisade tissue or rounded cells, near the surface only, and the internal mesophyll is destitute of chloroplastids. Certain leaves, too, which are equally exposed to light on all sides have stomata in equal numbers on both surfaces, and the palisade parenchyma is also developed in relation to both the dorsal and ventral surfaces, whilst the spongy tissue is either absent or limited to a few layers in the middle of the leaf-blade, and the intercellular spaces between the palisade-cells are relatively larger. In leaves floating on water, again, the greater number or the whole of the stomata exist on the upper surface.

Examination of Leaves.

The structure of leaves should be studied in the whole organ, in transverse sections, and by the aid of the isolated elements. (1) After ascertaining as much

as possible from the external appearance of the leaf when magnified, the whole or a portion of it should be soaked in chloral hydrate solution, which will render it transparent and enable its internal structure to be studied as a whole. (2) Sections should then be prepared from fresh leaves, or dried ones softened by soaking in water. These should be cut transversely, both in the direction of the midrib and at right angles to it. For this purpose the material is placed between two pieces of elder pith or fresh carrot, and sections of the whole are cut and transferred to a dish of water. The leaf sections are then easily separated for examination. (3) By macerating the leaves in solution of caustic potash varying in strength from one to five per cent. the epidermis on both sides may be detached, and the elements of the mesophyll and vascular bundles may also be isolated for separate examination. Each of these steps is essential to a thorough investigation of a leaf, particularly if it be desired to attain facility in the recognition of powdered specimens. For the reactions of the various elements references may be made to the previous articles in the Journal, or to Poulsen's 'Botanical Micro-Chemistry.'

Hyoscyamus Leaf.

The leaves of hyoscyamus are soft and viscid, and the epidermis (Fig 27) on both sides is covered with hairs, which are long, soft, and jointed. On drying, the midrib becomes very conspicuous, and the rest of the leaf shrinks considerably and acquires a greyish-green hue. A transverse section (Fig. 29), though a fresh leaf or dried material softened in water, shows that the long palisade-cells occur under the ventral or upper surface only, the spongy parenchyma beneath being somewhat closely

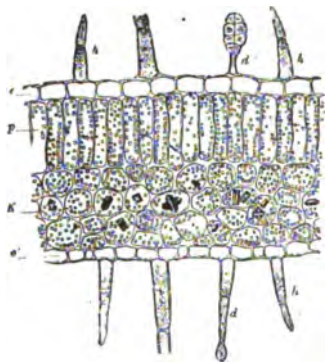


Fig. 29.—Hyoscyamus leaf, T.S.; e, upper epidermis; e', lower epidermis; d, glandular hairs; h, simple hairs; p, palisade-cells; k, crystal-cells. x150. (Vogl.)

packed, and including cells that contain single crystals of calcium oxalate that are comparatively small in size. The hairs when magnified are seen to be either unicellular or multicellular, the terminal cells of certain of the latter being in some cases expanded in a head-like form, constituting glands which exude a viscid substance that causes the fresh plant to feel clammy to the touch. Various forms of the multicellular hairs of hyoscyamus are illustrated in Moeller's 'Pharmakognostischer Atlas.' The epidermis consists of a single layer of cells, and stomata occur in the epidermal tissue of

both upper and lower surfaces of the leaf. The spiral vessels of the vascular bundles are very prominent (Fig. 28).

Stramonium Leaf.

The fresh leaves of stramonium are somewhat firm and juicy, downy when young, but smooth or nearly so at maturity. After drying they become brittle, and the upper surface is usually green or brownish-green in colour. The hairs vary in shape in a similar manner to those of hyoscyamus, both simple and glandular hairs occurring on the leaves, but they are much shorter than in hyoscyamus. Stomata occur on both surfaces of

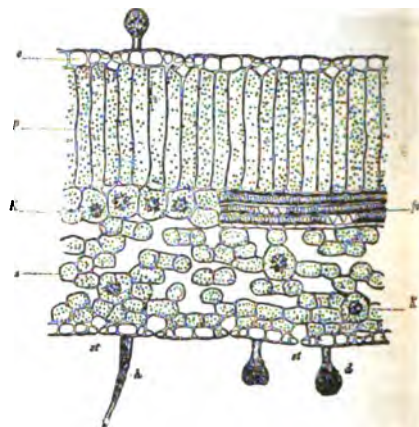


Fig. 30.—Stramonium leaf, T.S.; e, upper epidermis, with stomata and glandular hair; p, palisade-cells; k, vascular bundle; k, crystal-cells; s, spongy parenchyma; st, stomata; d, glandular hairs; h, simple hairs. x150. (Vogl.)

the leaf, and the epidermis consists of one layer of cells only. The arrangement of the mesophyll is similar to that of hyoscyamus, but the intercellular spaces in the spongy parenchyma are much greater in stramonium (Fig. 30). The crystals are here clustered instead of single, and much larger in proportion than those of hyoscyamus. In the vascular bundles the spiral vessels are again the most prominent constituents.

Senna Leaf.

Senna leaves of commerce are strictly the leaves of pari-pinnate leaves. They are rather soft and brittle, conspicuously veined, and covered with a very short and fine pubescence which is most dense on the midrib. Examination of a transverse section (Fig. 31) shows that it differs markedly from the examples already described. The epidermis apparently consists in part of two layers of cells but this is due to the deposition of mucilage in certain cells. The hairs are all unicellular and simple. The manner in which they are inserted between the epidermal cells is characteristic of senna. But the most important difference is the existence of palisade-cells on both sides of the lamina. The spongy parenchyma which is confined to the middle of the leaf includes cells containing both single and cluster crystals of calcium oxalate. A number of these crystal-cells are investing one of the vascular bundles as in a sheath (fv, Fig. 31), and where bundles are cut longitudinally, the spiral vessels are shown.

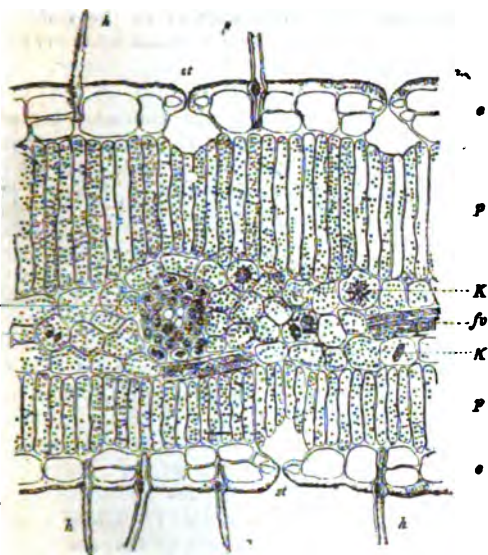


Fig. 31.—Senna leaf, T.S.; *e*, upper epidermis; *e'*, lower epidermis; *st*, stomata; *h*, hairs; *p*, palisade-cells; *k*, crystal-cells, with cluster crystals; *k'*, crystal-cells, with single crystals; *fv*, vascular bundle in transverse section; *fv'*, vascular bundle in longitudinal section. $\times 250$. (Vogl.)

Jaborandi Leaf.

Commercial jaborandi also consists of leaflets, being obtained from imparipinnate leaves. They are of a leathery consistence, have a prominent midrib below, and in transmitted light numerous oil glands are visible. The epidermis (Fig. 32) is one-layered, with a thick cuticle, and palisade tissue is seen to be almost absent, only a very thin layer being visible on the upper side of the lamina. The bulk of the meso-

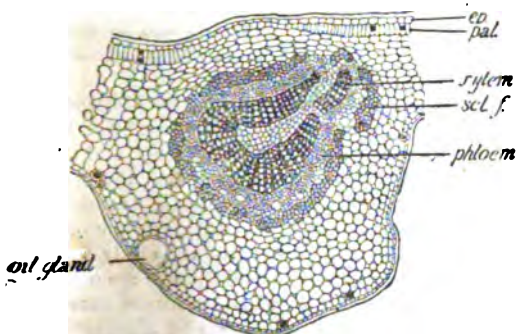


Fig. 32.—Jaborandi leaf, T.S.; *ep*, epidermis; *pal*, palisade-tissue; *scl*, sclerenchymatous fibres of pericycle. $\times 45$. (Greeniah.)

phyll consists, therefore, of spongy parenchyma, which includes large oil glands and cells containing cluster crystals. The oil glands are similar in structure to those occurring generally in the leaves of Rutaceæ and Myrtaceæ, and are largely distributed on both sides of the leaflets. They also occur in the petiole. There is a considerable development of xylem and phloem in the vascular bundles, in the middle of which a certain amount of conjunctive tissue appears, and the pericyclic layer of the midrib consists of sclerenchymatous fibres.

MODERN DEVELOPMENTS OF HARVEY'S WORK.*

BY DR. T. LAUDER BRUNTON, F.R.S.

CHEMISTRY OF THE CIRCULATION.

There is a consequence of the circulation to which Harvey has called attention, although only very briefly, which has now become of the utmost importance, and this is the admixture of blood from various parts of the body. After describing the intestinal veins, Harvey says:—

"The blood returning by these veins, and bringing the cruder juices along with it—on the one hand from the stomach, where they are thin, watery, and not yet perfectly chylified; on the other, thick and more earthy, as derived from the fæces—but all pouring into this splenic branch are duly tempered by the admixture of contraries."[†]

Harvey's chemical expressions are crude, for chemistry as a science only began to exist about a century and a half after Harvey's death, yet the general idea which he expresses in the words which I have just quoted is wonderfully near the truth.

The most important constituents of the blood are chloride of sodium and water. Chloride of sodium is a neutral salt, but during digestion both it and water are decomposed in the gastric glands and hydrochloric acid is poured into the stomach, while a corresponding amount of soda is returned into the blood, and its alkalinity increases *pari passu* with the acidity of the stomach. Part of this alkali is excreted in the urine, so that the urine during digestion is often neutral or alkaline, and possibly some of it passes out through the liver with the bile of the pancreas and intestinal juice, where, again mixing with the chyle from the stomach, neutralisation takes place, so that neutral and comparatively inactive chloride of sodium is again formed from the union of active alkali and acid. But it is most probable that what occurs in the stomach occurs also in the other glands, and that it is not merely excess of alkali resulting from gastric digestion which is poured out by the liver, pancreas, and intestine, but that these glands also decompose salts, pour the alkali out through the ducts, and return the acid into the blood.

We are now leaving the region of definite fact and passing into that of fancy, but the fancies are not entirely baseless, and may show in what direction we may search out and study the secrets of Nature by way of experiment; for what is apparently certain in regard to the decomposition of chloride of sodium in the stomach, and probably in the case of neutral salts in the pancreas and intestine, is also probable in that important, though as yet very imperfectly known, class of bodies which are known as zymogens. Just as we have in the stomach an inactive salt, so we have also an inactive pepsinogen which, like the salt, is split up in the gastric glands and active pepsin is poured into the stomach. But is the pepsin the only active substance produced? Has no other body, resulting from decomposition of the pepsinogen, been

* Extracted from the Harveian Oration for 1894.

† The Works of William Harvey, Sydenham Society's Edition, p. 75.

poured into the blood while the pepsin passed into the stomach? Has the inactive pepsinogen not been split up into two bodies active when apart, inactive when combined? May it not be fitly compared, as I have said elsewhere, to a cup or glass, harmless while whole, but yielding sharp and even dangerous splinters when broken, although these may again be united into a harmless whole?

This question at present we cannot answer, but in the pancreas there is an indication that something of the kind takes place, for Lépine has discovered that while this gland pours into the intestine a ferment which converts starch into sugar, it pours through the lymphatics into the blood another ferment which destroys sugar. Whether a similar occurrence takes place in regard to its other ferments in the pancreas or in the glands of the intestine we do not know, nor do we yet know whether the same process goes on in the skin, and whether the secretion of sweat, which is usually looked upon as its sole function, bears really the relationship to cutaneous activity which the secretion of bile bears to the functions of the liver. There are indications that such is the case, for when the skin is varnished not only does the temperature of the animal rapidly sink, but congestion occurs in internal organs, and dropsy takes place in serous cavities, while in extensive burns of the skin rapid disintegration of the blood corpuscles occurs.

It is obvious that if this idea be at all correct a complete revolution will be required in the views we have been accustomed to entertain regarding the action of many medicines. In the case of purgatives and diaphoretics, for example, we have looked mainly at the secretions poured out after their administration, whereas it may be that the main part of the benefit that they produce is not by the substances liberated through the secretions they cause, but returned from the intestine and skin into the circulating blood.

MEDICATION BY ORGANIC JUICES.

How important an effect the excessive admixture of the juices from one part of the animal body with the circulating blood might have was shown in the most striking way by Wooldridge. He found that the juice of the thyroid gland, injected into the blood, would cause it to coagulate almost instantaneously, and kill the animal as quickly as a rifle bullet. What is powerful for harm is, likewise, powerful for good in these cases, and the administration of thyroid juice in cases of myxœdema is one of the most remarkable therapeutic discoveries of modern times. Since the introduction by Corvisart of pepsin as a remedy in dyspepsia, digestive ferments have been largely employed to assist the stomach and intestine in the performance of their functions, but very little has been done until lately in the way of modifying tissue changes in the body by the introduction of ferments derived from solid organs. For ages back savages have eaten the raw hearts and other organs of the animals which they have killed, or the enemies they have conquered, under the belief that they would thereby obtain increased vigour or courage; but the first definite attempt to cure a disease by supplying a ferment

from a known glandular organ of the body was, I believe, made in Harvey's own hospital by the use of raw meat in diabetes.* It was not, however, until Brown-Séquard recommended the use of testicular extract that the attention of the profession became attracted to the use of extracts of solid organs. Since then extract of thyroid, extract of kidney, extract of suprarenal capsule have been employed, but even yet they are only upon their trial, and the limits of their utility have not yet been definitely ascertained.

MEDICATION BY ANTITOXINS.

But yet another therapeutic method has recently been introduced which bids fair to be of the utmost importance, the treatment of disease by antitoxins. The discovery by Pasteur of the dependence of many diseases upon the presence of minute organisms may be ranked with that of Harvey, both in regard to the far-reaching benefits which it has conferred upon mankind and for the simplicity of its origin. "Why does a crystal of tartaric acid sometimes crystallise in one form and sometimes in another?" These minute organisms, far removed from man as they are in their structure and place in Nature, appear in some respects to resemble him in the processes of their growth and nutrition. They seem, indeed, to have the power of splitting up inactive bodies into substances having a great physiological or chemical activity. From grape sugar, which is comparatively inert, they produce carbonic acid and alcohol, both of which have a powerful physiological action. From inert albumin they produce albumoses having a most powerful toxic action, and to the poisonous properties of these substances attention was for a while alone directed; but it would appear that at the same time that they produce poisons they also form antidotes, and when cultivated without the body and introduced into the living organism they give rise to the production of these antidotes in still greater quantity, and by the use of antitoxin tetanus and diphtheria appear to be deprived of much of their terrible power.

The plan of protection from infective diseases which was first employed by Jenner in small-pox is now being extended to many other diseases, and the protective substances which are formed in the body and the mode of action are being carefully investigated. The introduction of either the pathogenic microbe or of toxic products appears to excite in the body a process of tissue change by which antitoxins are produced, and these may be employed either for the purpose of protection or cure. It was shown by Wooldridge that thyroid juice has a power of destroying anthrax poison, and it seems probable that increase of the circulation of certain organs will increase their tissue activity, and thus influence the invasion or progress of disease. As I have already mentioned, we are able to influence the circulation in muscles both by voluntary exertion and by passive massage, and we should expect that both of these measures would influence the constituents of the blood generally, and such, indeed, appears to be the case; for J. K. Mitchell has found that after massage the number of blood corpuscles in the circulation is very considerably increased.

* *British Medical Journal*, February 21, 1874, p. 281. *et seq.*

DEGRAS.*

BY CHARLES S. BUSH.

In America the term "degras" is generally applied to the grease or fatty matter recovered from the water in which wool has been scoured; in various portions of Europe the term is employed not only in connection with grease extracted from the waste-water of wool-washing establishments, but also to designate the oil or fatty matter recovered at chamois skin manufactories. It is my intention at this time to call your especial attention to degras of the first-named type, which, I may say, has but one source, namely, the water in which wool has been scoured.†

The process of producing or manufacturing degras (or so-called wool grease) is, comparatively speaking, a simple one, and may be described as follows: The soapy liquid remaining in the scouring tubs or machines after the wool has been scoured is run off into a large shallow tank or pond and allowed to settle; the greater portion of the grease rises to the surface, but more or less adheres to the dirt and other foreign matter, and is carried to the bottom. From time to time the material which has accumulated at the bottom of the tank or pond is removed, and the grease, or a large portion thereof, is recovered. After the settling process is completed the liquid is pumped into tanks and allowed to stand for a few days. The next step in the process is to add sulphuric acid. This withdraws the alkali used for washing the wool and breaking up the soapy emulsion, causes the grease and water to separate—this is commonly called "cracking the grease." The contents of the tanks are then transferred to filter beds, where the water is allowed to drain off, the grease and sediment being left behind in the filters. The filter beds may be composed of sawdust or other suitable material. The substance remaining in the filters is then transferred to pieces of bagging and shaped into flat packages. A large number of these packages are placed in power presses and steam applied in order to raise the temperature sufficiently to cause the grease to ooze out and flow into tanks provided for the purpose. Any water which may find its way into the presses will naturally pass into the tanks with the grease, but separation takes place at once, and the hot degras, forming a layer on top, is readily drawn off into the barrels. After the degras has been allowed to cool, it is of about the consistency of soft tallow, and in such form is ready for market.

The colour of the substance under consideration is yellowish-brown; it has a disagreeable odour, which is not easily described. This odour is due to two causes: first, the presence of foreign substances, as dung and urine products, which are still present while the grease is being melted; second, the presence of certain volatile fatty acids which were present as potash salts in the wool, and, being soluble in the grease, remain with it after treatment of the emulsion with strong acid.

The individual character is given to wool grease by an interesting substance called cholesterin, the chemical formula of which is $C_{26}H_{44}O$. This substance is soluble in hot alcohol but precipitated in cold, in the form of tabular crystals somewhat resembling silver nitrate. As the extracted wool grease does not precipitate in the crystalline form, I think it is fair to infer that the cholesterin exists in the wool fat chemically combined with the fatty acid, and not in a state of mixture. Cholesterin is not saponifiable, but it makes a most perfect emulsion, taking up 120 per cent. of water, and remaining in that emulsive state for years; a sample in my possession is three years old, and still shows no signs of separating.

Degras finds its chief use in the finishing of leather, superseding tallow for that purpose to a great extent, on account of the low price of the former, and because of its penetrating and emollient nature. Degras is used to some extent in the manufacture of wool-oils, rope-oils, etc. Many persons have been led to believe that this waste material, which has polluted our streams and formed a subject for much discussion, is used extensively in the manufacture of soap. Some months since an article appeared in one of our local newspapers, from which I quote the following words: "In regard to finding a market for this material, I think it possible to sell it to almost any soap manufacturer. A large business is done in New York in this, and at a price of 2 to 2½ cents per pound." To say the least, this newspaper statement is misleading. Degras has been used to a slight extent by a few soap manufacturers, but the results have been anything but satisfactory. Cholesterin is unsaponifiable, and a positive injury to the soap. It has no detergent properties, and is undesirable as a "filler." There is no doubt that new outlets for this interesting product will be discovered eventually.

CONTRIBUTIONS TO THE CHEMISTRY OF CERIUM.*

BY L. M. DENNIS AND W. H. MAGEE.

The mineral cerite was first found in one of the iron mines of Bastnäs, in Westmanland, Sweden. Its peculiarity was noticed as early as 1751 by Cronstedt,† and in 1784 it was analysed by d'Elhuyar,‡ in Bergmann's laboratory, and was considered by these two chemists to be a silicate of lime and iron. In 1803 the mineral was again examined by Berzelius and Hisinger, and by Klaproth, and nearly at the same time, but independently, they discovered in the mineral a new oxide. Berzelius and Hisinger named the earth *ceria*,§ after the planet Ceres, which had been discovered two years before by Piazzi. Klaproth called it *ochroiterde*,|| from its brownish-yellow colour. Fortunately the former name was adopted, for the latter name would have been a misnomer, since pure cerium dioxide, as we now know it, has a pale-yellow colour.

From that time to the present, cerium and its com-

* Read at the Brooklyn Meeting of the American Chemical Society, August 15, 1894, and reprinted from the *Journal of the American Chemical Society*.

† *Sv. Vet. Akad. Handl.*, 1751, 8, 227.

‡ *Sv. Vet. Akad. Handl.*, 1784, 8, 121.

§ *Ashandl. i. Fysik, Kemi och Mineral*, I, 58.

|| *A. Gehl.*, 2, 303; *Beiträge*, 4, 140.

* Read before the Rhode Island Section of the American Chemical Society, January 25, 1894. Reprinted from the *Journal of the American Chemical Society*.

† This is the product known in England as "commercial wool-fat."

pounds have frequently been the subject of investigation, but the work of the earlier chemists is not of direct importance, since the ceria upon which they worked was, as we now know, a mixture of various oxides, chief among them being those of cerium, lanthanum, and didymium.

In 1839, however, Mosander made known a discovery of the highest importance; namely, that ceria was not a simple oxide, but a mixture of at least two. The newly isolated earth he called *lanthana*, and this, in 1842, he split up into *lanthana* proper, and another oxide which he named *didymia*.*

Dating from the time of Mosander's discoveries, the results of the various investigations upon cerium acquire, of course, much greater value, but the chemistry of this element and the other rare earths has remained one of the most difficult problems in the field of inorganic chemistry, chiefly because of the great similarity in the chemical behaviour of these different elements and the consequent difficulty of separating any one of them completely from the others. Naturally, then, in an experimental investigation of the compounds of cerium, the first problem to be solved is the preparation of pure ceria.

I. SEPARATION OF CERIA FROM THE OTHER EARTHS.

The ceria was extracted from allanite from Amelia County, Virginia, a large amount of this mineral having been most kindly sent to us by Professor W. G. Brown, of the Washington and Lee University.

Nineteen hundred and twenty-four grammes of the finely powdered allanite was heated in large porcelain evaporators with concentrated hydrochloric acid until the supernatant liquid became dark brown. The syrupy liquid was allowed to cool and was then poured off, the residual mineral being again treated in the same manner until it became grayish-white, three treatments of about ten hours each usually sufficing. A portion of the residue was then moistened with concentrated sulphuric acid and heated until all of the acid was driven off. The white residue was thrown, in small portions at a time, into ice-water, and to the filtered solution, oxalic acid was added. No precipitate resulted showing that the treatment with hydrochloric acid had removed all of the rare earths.

The rare earth chlorides, mixed with those of iron, aluminium, calcium, etc., were then diluted and filtered. A portion of this filtrate was treated with hydrogen sulphide for twenty-four hours, the solution being kept at 70°, but no precipitate appeared. The hydrogen sulphide was then expelled by boiling, the sulphur was filtered off, and the filtrate was added to the original solution. This was oxidised by nitric acid and a concentrated solution of oxalic acid was then added in excess. The pinkish-white precipitate of the rare earth oxalates was allowed to settle, and the oxalates were then washed by decantation with hot water until the supernatant liquid was colourless. They were then digested in large evaporators with one per cent. hydrochloric acid until all iron had been removed and were then dried and ignited in a muffle

furnace. The reddish-brown oxides resulting weighed 410 grammes, a yield of over twenty-one per cent.

The oxides were dissolved in concentrated nitric acid. To facilitate solution sulphurous acid was added to one portion and oxalic acid to another, but with no perceptible benefit in either case. There were obtained four litres of an almost syrupy solution which showed the didymium absorption bands very strongly.

Many different methods for separating the ceria from the accompanying earths have been proposed, but none of them seem to yield cerium which is completely free from lanthanum and didymium unless the method proposed be many times repeated. Mosander,* the earliest worker upon this problem, obtained a mixture of didymia and lanthana free from ceria by precipitating the mixed chlorides with potassium or sodium hydroxide and passing chlorine through the suspended hydroxides. Cerous hydroxide is oxidised to the insoluble ceric hydroxide while the hydroxides of lanthanum and didymium are changed to chlorides and dissolve. Jolin† found that the treatment must be made seven times before the ceria is completely free from didymia and lanthana. Poppe‡ added sodium acetate to the solution of the chlorides and ran in chlorine, the cerium being precipitated. Later, instead of passing in chlorine gas he added sodium hypochlorite and boiled. Gibbs§ boiled the mixed earths with nitric acid (1:2), having first added considerable lead dioxide. Zschiesche|| heated the rare earth sulphates with red lead and nitric acid. In each of the last two methods ceric oxide is formed. Winkler¶ separated ceria and didymia from lanthana by adding mercurous oxide to the solution of the chlorides and then potassium permanganate until the solution is coloured by the latter. Ceria and didymia are precipitated. Welsbach** precipitates the ceria by fractional crystallisation as cerium ammonium nitrate. Bunsen first†† proposed to ignite the oxides with magnesia, to dissolve out the ceria as cerium magnesium nitrate and then pour the solution of the latter into a large amount of very dilute nitric acid, whereby ceric oxide is precipitated. Later‡‡ he abandoned this method and proposed instead the method which has been most employed for preparing pure ceria. A solution of impure cerium sulphate is poured into boiling water containing one part of nitric acid to the thousand, and basic cerium sulphate is thrown down. This procedure must be repeated several times and is also very wasteful because the yield is small, so that it can be used with advantage only on material that is already nearly pure. Brauner§§ increased the yield by dissolving finally in nitric acid instead of in sulphuric acid, driving off

* *Phil. Mag.*, 23, 241.

† *Bihang till K. Sv. Vet. Akad. Handl.*, 2, 14; *Bull. Soc. Chim.*, [2], 21, 538.

‡ *Ann.*, 131, 359; *J. B.*, 1864, 195 and 702.

§ *Sill. Amer. Jour.* [2], 27, 332.

|| *J. prakt. Chem.*, 107, 65.

¶ *J. prakt. Chem.*, 95, 410.

** *Monatsh. f. chem.*, 4, 630.

†† *Ann.*, 105, 40.

‡‡ *Pogg. Ann.*, 155, 375.

§§ *Monatsh. f. chem.*, 6, 792.

* *Förh. Skand. Naturf. Stockholm*, 1842, 387; *Phil. Mag.*, 28, 241; *Pogg. Ann.*, 56, 503; *J. prakt. Chem.*, 30, 276.

the excess of acid and precipitating with boiling water containing nitric acid. Debray* fused the nitrates of the earths with from eight to ten times their weight of potassium nitrate at a temperature between 300° and 350°. The nitrate of cerium is decomposed, leaving the oxide which is insoluble in water. The other nitrates are undecomposed and are soluble in water. Many repetitions were necessary to free the ceria from the other earths. Pattinson and Clark† heated the mixed chromates to 110° when cerium chromate decomposes to ceric oxide, the other chromates remaining unchanged.

For the separation of the ceria from the other earths in the allanite solution obtained as stated above, the authors first employed the Mosander-Jolin method, which so eminent an investigator as Cleve has pronounced to be the best. The nitrate solution of the earths was diluted, potassium hydroxide was added in excess, and well-washed chlorine gas was run into the solution for from four to five days. The white precipitate of the hydroxides soon changed to a dirty violet and became light yellow soon after the action of the chlorine began. The ceric oxide was washed by decantation until the wash-water gave no precipitate with ammonium hydroxide, this washing occupying nearly a week, as the precipitate settles very slowly. The precipitate was then dissolved in hydrochloric acid and the treatment with chlorine was repeated. After seven complete treatments the concentrated solution of cerium chloride showed no absorption bands when a layer ten Cm. thick was examined with a Krüss spectroscopie. The solution was then nearly neutralised with ammonium hydroxide and hydrogen sulphide was run in for twenty-four hours, the solution being warmed to 70°. A very slight precipitate of copper sulphide resulted. This was filtered off, the hydrogen sulphide was expelled by boiling and the separated sulphur was removed by filtration. To the filtrate was added a concentrated solution of pure oxalic acid, a snow-white precipitate of the oxalates of the rare earths resulting. This precipitate was treated with a hot solution of hydrochloric acid (two per cent.) until the washing liquid failed to give a reaction for iron when tested with potassium sulphocyanate and ether. The oxalate was then dried and ignited in porcelain crucibles over the blast-lamp. The resulting oxide was of a pale yellow colour resembling in tint very light chamois leather.

In the meantime the method of separation proposed by Debray was tried upon another portion of the rare earths. It was found that the melting point of the mixture of rare earth nitrates and potassium nitrate was usually about 325°. (The melting point of potassium nitrate is stated to be 339°.) Upon treating the fused mass with water it was found that the insoluble residue contained, even after two fusions, appreciable amounts of didymium. Since cerium nitrate begins to decompose at 200° and didymium nitrate at about 300°, the cause of the presence of didymium in the insoluble cerium oxide is

evidently to be ascribed to the high melting point of the nitrate mixture employed by Debray. If, then, the melting point of the mixture could be lowered the probable result would be that less of the didymium nitrate would be decomposed, and it seemed reasonable to expect that, by sufficiently depressing the melting point, cerium oxide completely free from didymium might be obtained by a single fusion. With this end in view the potassium nitrate was replaced by sodium nitrate, the melting point of the latter, 316°, being somewhat lower than that of the potassium nitrate. But even with this salt more than two fusions were necessary to free the cerium from didymium.

Carnelley and Thomson* have shown that while potassium nitrate melts at 339° and sodium nitrate at 316°, a mixture of these two salts in molecular proportion melts at 231°. Consequently, this mixture was next tried with the rare earth nitrates, the details of the method being as follows:—

The oxalates of the rare earths, after being freed from iron, as above described, are placed in porcelain evaporating dishes, the oxalates being covered by funnels of such size that when inverted they fit inside the edge of the evaporating dish. Concentrated nitric acid is now poured over the oxalates. Action begins at once in the cold, but it can be greatly hastened by warming on a water-bath. After the nitrogen oxides cease to come off, and the liquid has become clear, the solution, which should be so concentrated as to be syrupy in consistency, is poured while still hot into large porcelain crucibles half-filled with the well-ground mixture of potassium and sodium nitrates. About enough of the solution to completely cover the dry nitrates is poured in and the whole is thoroughly mixed by stirring.

For heating the crucibles a double air-bath was used. Both of the air-baths and the two covers were lined within and without with asbestos board. Through the two covers, openings were made through which thermometers could be introduced at various points within the inner bath. The crucibles were placed in circular openings cut in a piece of asbestos board, this board resting on pipe clay rods in the inner air-baths. The asbestos board was also pierced with many smaller openings to allow free circulation of air. The air-bath was heated by two Bunsen burners, the height of the flame being kept constant by means of "precision" gas-cocks.

After the crucibles have been placed in position the temperature is brought up slowly, too rapid heating being liable to cause the mass in the crucibles to swell and run over the edge. The two covers are placed in position, and a thermometer is inserted through the centre opening to such a distance that its bulb is on a level with the bottoms of the crucibles. The heat is gradually increased until the thermometer shows a temperature of 300° in the inner bath. The mixture melts at a little below 230°, and decomposition of the cerium nitrate begins almost immediately. As the temperature rises the brown fumes come off copiously, the

* *Compt. rend.*, 96, 828.

† *Chem. News*, 16, 259.

* *J. Chem. Soc.*, 53, 782.

evolution gradually lessening as the heating continues. If, after removing the covers, it is seen that the evolution of gas from the fusion has entirely ceased, then the decomposition possible at the temperature employed is complete. This usually takes from four to five hours after the temperature has risen to 300°. It was found that the cerium nitrate is not entirely decomposed even when the temperature has been kept at 350° for some time, and also that if the temperature rises above 320° the cerium oxide will contain some didymium. After the evolution of nitrogen oxides ceases, the bath is allowed to cool rapidly, since by so doing the solid mass can usually be removed by inverting the crucible and tapping the edge gently. If it cannot be removed in this way it can usually be loosened by throwing a jet of hot water around the upper edge. The removal of the mass in a solid block is of advantage, since the condition of the decomposition may be judged by the colour of the oxide which has collected at the bottom. If it is bright yellow or nearly white the ceria is probably pure, but if brownish in colour then some of the didymium nitrate also has been decomposed.

The solid mass is now treated with hot water, which dissolves all but the oxides. These are allowed to settle and the supernatant liquid is decanted off through a filter. More hot water containing from four to five per cent. of nitric acid is poured over the oxides, and the liquid is brought to boiling and poured while hot through the filter. This is repeated six times and finally the oxides are washed with hot water alone, the washing being continued until the wash-water gives no precipitate with ammonia.

The oxides are dissolved by heating them with concentrated sulphuric acid until fumes of sulphur trioxide begin to escape, allowing the mass to cool and then treating it with a large amount of water. More rapid solution can, however, be effected by throwing a jet of water upon the hot sulphates and stirring the mass constantly. There is some tendency to spatter, but solution is obtained in much less time and with much less water than in the first procedure. A concentrated solution of cerium sulphate thus obtained showed no didymium absorption bands in a layer thirty Cm. thick.

To test the separation quantitatively, weighed amounts of pure cerium and didymium oxalates were mixed, the mixture was dissolved in nitric acid as above described and the mass was fused with the mixed alkali nitrates. The soluble portion from the first fusion was evaporated down and again fused with the alkaline nitrates, and this solution and fusion was repeated in all four times. The temperature during each fusion was about 300°. The insoluble cerium oxide resulting from the fusions was in each case free from didymium, and of the total cerium taken more than sixty-three per cent. was obtained completely free from didymium by the four fusions.

Another sample of the mixed nitrates was fused at about 350°. The layer of cerium oxide which collected at the bottom of the fused mass showed a brown coloration at the edges, and the insoluble

residue, after being carefully washed and dissolved in sulphuric acid gave the didymium bands clearly. The filtrate tested by the hydrogen peroxide method mentioned below showed some cerium still present with the didymium.

From the foregoing it will be seen that while the method is not quantitative it is nevertheless quite rapid and the yield is comparatively high. Its chief merit lies in the fact that the cerium oxide resulting from each single fusion is free from didymium, an advantage which does not seem to be possessed by the other separation methods with which the authors are acquainted.

(To be continued.)

OPIMUM TRADE OF CHEFOO, CHINA.

The remarks to be made on opium in these reports might almost be stereotyped for annual use. Indian opium remains the luxury of the rich, and the trade in it is so small as scarcely to call for remark. There is a slight increase in the total amount imported in 1893, 339 chests, instead of the 311 chests of 1892, but the value of the Indian opium brought annually to Chefoo has dropped below 150,000 taels, and will probably become smaller still as time goes on.—*Consular Report.*

TOBACCO CULTIVATION IN CUBA.

Pinar del Rio, the western province of Cuba, is given up almost entirely to the cultivation of tobacco. The plantations are scattered about in all directions, generally a mile or two apart. They consist of a number of small fields ("vegas") of about ten acres each, selected wherever the land is richest. The rest of the land is entirely uncultivated. The tobacco seed is sown in nurseries, about ten lbs being used per acre. In October and November the young plants, when about three inches high, are bedded out in the tobacco fields, in furrows two feet apart. During the three months the plants take to reach their full size, the greatest care is taken of them. Each plant is constantly examined, the green tobacco caterpillars killed, and the furrows kept perfectly clean with the plough. When the plant has grown its big leaves, generally about ten in number, all the small leaves are picked off the stalk, and on reaching its full height the head of the plant is also picked off. This allows the leaves to expand and spread out in the sun. The female plant gives the best leaves for capas (the outside wrapper of a cigar), as the leaves are larger and stronger. The colour of the leaf is bright green until ready for picking, when it begins to turn yellow and spotty. They are then gathered by cutting the stalk in such a manner that two leaves remain on each piece of stalk. The leaves are then strung over thin poles in the drying houses, one leaf each side of the pole, and left to dry about five weeks. The drying houses are large, airy barns, thatched with palm leaves, the inside being arranged with rows of poles one above another. On being taken down the leaves are put together in bundles of about 100 leaves, which are made into bales of usually eighty bundles and wrapped up in palm leaves. The bales are then ready for sale, and are taken in this state to the storing rooms of the cigar manufactories in Havana.—*Consular Report.*

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, OCTOBER 27, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

STANDARDS OF PURITY.

FROM time to time we have had occasion to protest against the manner in which the sale of drugs not of the proper standard of quality by unregistered persons was attributed to chemists and druggists. For, as is well known to our readers, in the great majority of cases where such offences are reported in the daily press as committed by "chemists," the defendants have no legal claim to that title. In the annual government report under the Sale of Food and Drugs Acts, too, the statement of the number of convictions for adulteration or substitution of drugs is recorded in such an unsatisfactory way as to give ground for the not unnatural inference that the defective substances were purchased of chemists and druggists alone, rather than, as is actually the case in most instances, of grocers and small shopkeepers. Yet the painful fact remains that in a certain number of instances, limited though that number be, chemists have been found so wanting in care or honesty, as to cast discredit on their class by failing to rebut the evidence of official analysts, when given in courts of law. It is evident that the many not so distinguished may suffer under imputations unfairly cast upon the whole class of chemists and druggists because of the faults of the few. Any alteration in the law, therefore, which may tend to single out offenders more clearly than at present, especially if it be more clearly indicated what does or does not constitute an offence, should be cordially welcomed by our readers generally.

As the result of long-continued agitation on the part of the Society of Public Analysts, a draft bill was prepared by the council of that society in June last, for the purpose of amending the adulteration of food Acts, and to make better provision for the

sale of food and drugs in a pure state. In this bill it is proposed that the term "drug" shall include medicines for external or internal use, and it is provided that "no person shall, except for the purpose of compounding as hereinafter described, mix, colour, stain, or powder, or order or permit any other person to mix, colour, stain, or powder any drug with any ingredient or material so as to affect injuriously the quality or potency of such drug, with the intent that the same may be sold in that state, and no person shall sell any such drug so mixed," etc., etc. The penalty in each case shall not exceed fifty pounds for the first offence, but imprisonment for a period not exceeding six months with hard labour shall follow each subsequent conviction. Ignorance of, or inability to detect, sophistication is regarded as a reasonable excuse, but, again, the sale to the prejudice of the purchaser of any drug not of the nature, substance, and quality of the article demanded, shall render the seller liable to a penalty not exceeding twenty pounds. Further, any drug sold under any name included in the British Pharmacopoeia shall be required to comply with the description, character, and tests for such drug as specified in the latest edition, with amendments, of the British Pharmacopoeia, provided that the drug be not included in a scheduled list of articles bearing names identical with B.P. remedies, but not required to be of B.P. quality. Compounded drugs must be composed of ingredients in accordance with the demand of the purchaser, but drugs not recognised in the B.P. may be mixed with anything not injurious to health nor intended to promote fraud, if when sold they are distinctly labelled as mixtures. Accidental deterioration of the article, or accidental abstraction, spontaneous separation, or evaporation of the ingredients, shall be no defence under the last section.

Since nothing can excuse either the wilful sophistication of drugs or want of care in ascertaining their purity before sale, pharmacists are not likely to find anything particularly objectionable in the definitions of offences under the proposed Act, but it is more than probable that they will see grave cause for protesting against certain suggested details of procedure. The most notable propositions are that "no certificate, other than that of the public analyst, shall be received in evidence, unless supported by the oral evidence of the analyst giving the certificate," and that there shall be constituted a board of reference, "consisting of the chief chemical officer of the Inland Revenue Laboratory, a person nominated by the General Medical Council, three persons, being public analysts, nominated by the Local Government Board, and a person nominated by the Board of Agriculture." The effect of these clauses will be to enormously

and unduly magnify the position of the public analyst. It is difficult to see why the certificate of that individual should be considered of equal value as evidence with the oral evidence of other chemists, frequently experts with both greater general and special knowledge than himself. Nor is it easy to comprehend why he should usurp half the representation on the board of reference. The tendency is plainly in the direction we have formerly deprecated in these pages, *viz.*, endeavour on the part of public analysts to constitute themselves advocates and judges, rather than content themselves with the performance of their proper duties as experts under the adulteration laws. A satisfactory board of reference should include representatives of those individuals whose businesses are chiefly affected by the law, and if two out of the three public analysts were replaced by nominees of representative bodies of chemists and grocers respectively, greater dependence might be placed upon the fairness of its decisions. As the scheme stands, it is calculated to give rise to great dissatisfaction and grave inconvenience, with no corresponding advantage, unless the creation of a large class of irresponsible dictators from material of doubtful fitness be regarded as such. Though, as already suggested, pharmacists generally would doubtless be willing to lend their support to any satisfactory bill for amending the existing law, there is every reason for their seeking to modify or defeat the passing of any bill which would impose further unnecessary restrictions upon their already much hampered business, or deliver them unprotected into the hands of more or less incompetent officials.

BOOKS MISSING FROM THE LIBRARY.

THE attention of Members, Associates, and Students of the Society is directed to the announcement on page v. of our advertising columns, where a list is published of books missing from the Society's Library. Our readers are requested to search their shelves and return any of the volumes they may find at the earliest possible opportunity.

COLONIAL AND FOREIGN ISSUE.

THE Journal of December 1 next will have a special colonial and foreign circulation, as more than five thousand copies of that issue will be sent to chemists and druggists and others interested in pharmacy, in Australia, New Zealand, Tasmania, India, Ceylon, Philippine Islands, Hong Kong, Straits Settlements, Malay States, China, Japan, South Africa, West Indies, Canada, etc., etc.

ANTI-DIPHTHERITIC SERUM.

AN appeal made by the *Paris Figaro* for funds to enable the Pasteur Institute to supply Dr. Roux's anti-diphtheritic serum to all medical practitioners who might apply for it, has resulted in the sum of £10,000 being raised. It is stated that the Paris Academy of Medicine has reported in favour of this system of treatment.

POISONS IN PROPRIETARY MEDICINES.

WE have received advance proof-sheets of Messrs. F. NEWBERRY and SONS' catalogue for 1895, and note that the proprietors have adopted the suggestion made in our columns last week by Mr. E. B. VIZER, of Brighton, indicating proprietary medicines labelled "Poison" by the manufacturers by placing the letter "(P)" against their names.

BUSINESS CHANGE.

MR. J. A. E. BREEZE, chemist and druggist, Pontesbury, has recently acquired the business of the late H. E. FIELD, 70, Oxton Road, Birkenhead, which he intends to carry on under the same style as formerly. The business was in the hands of the former proprietor for more than a quarter of a century.

THE HARVEIAN ORATION.

THE annual Harveian Oration was delivered on Thursday, October 18, before the President and Fellows of the Royal College of Physicians, by Dr. J. LAUDER BRUNTON, F.R.S., honorary member of the Pharmaceutical Society. It dealt with "Modern Developments of Harvey's Work," and an extract from it, which we reprint at page 335 of this week's Journal, will be found to possess considerable interest from a chemical point of view.

LIVERPOOL CHEMISTS' RETAIL PRICE LIST.

WE are asked to state that the Council of the Liverpool Chemists' Association is engaged upon the revision of the above price list, and as the work is extensively used in all parts of the country they invite suggestions from all quarters, with the object of making the work as complete as possible, so that it may be still more generally adopted. Every detail is receiving most careful consideration, and it is expected that the new edition will be ready by the beginning of the new year. Communications may be addressed to the Honorary Secretary of the Liverpool Chemists' Association, Royal Institution, Colquitt Street, Liverpool.

THE ROYAL FREE HOSPITAL.

THERE was a social function of some interest at the Royal Free Hospital, Gray's Inn Road, on Wednesday afternoon last, when the governors and their friends were invited to meet the Lord Mayor (who is a member of the Committee) and Lady Mayoress, they having expressed a wish to inspect the new buildings which have recently been added to the hospital. His Lordship expressed much pleasure in being present, and strongly advocated the claims of the hospital on the benevolence of the public. An informal procession was then made round the buildings, which are of the most approved construction, and were generally admired. The medical students (who are all of the gentler and fairer sex at this hospital) were most assiduous in looking after the comfort of their visitors and pointing out the most interesting features of the establishment. In addition to the governors and members of committee present there were, among the visitors, medical men and women (including Dr. GARRETT ANDERSON), and several members and friends of the Pharmaceutical Society. Naturally, the dispensary was visited and keenly inspected by the latter: the fittings, which are very complete and convenient, were, we believe, arranged under the advice of Mr. MARTINDALE, and it was stated that 200 bottles of medicine and upwards are often dispensed daily by the dispenser and his assistants. Altogether a very pleasant time was spent by the visitors in inspecting the building and hearing of the good work done at this institution.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of this Association was held at 103, Great Russell Street, on Thursday, October 18, the President, Mr. R. H. Jones, in the chair. Letters were received from Messrs. Cartelghe, Andrews, and Tyrer, regretting their inability to attend. A very interesting discussion on "The duties of the Pharmaceutical Society as an educational body" was opened by the reading of a paper of which the following is an abstract:—

THE DUTIES OF THE PHARMACEUTICAL SOCIETY AS AN EDUCATIONAL BODY.

BY M. H. GANE.

My object in thus entitling my paper is to bring to your notice three questions: (1) What is the duty of the Society in this respect? (2) How is that duty at present discharged? (3) How may it be better fulfilled?

The first question is one that can be answered briefly. Personally, I am of opinion that in the direction of the Society offering every educational advantage, in order that we may qualify ourselves as professional men, alone lies hope for the future pharmacist. That brings us to the second query as to how the obligations of the Society are at present discharged. They are discharged in the establishment of the School of Pharmacy and in the foundation of the Research Laboratory, but in such a way that the majority of the younger members are prevented from taking advantage of those institutions. The average assistant is not as a rule blessed with too much of this world's good things, and the high fees at the official school render it impossible for the great majority to obtain the education which it alone affords. The Society spends annually on that establishment some £800, and has an average of about eighty students, so that each student obtains a premium of about £10 a year, and it is just those students who could best afford to do without it. Put plainly it is making the poor help to educate the rich. The amount annually contributed to the Society from students for examination fees is about £8000, more than one-third of the total income of the Society, in addition to the students' subscriptions, and we are surely entitled to ask for some consideration in return for those payments, as well as the students in the School of Pharmacy.

For the man who has passed and wishes to continue his studies there are no facilities whatever offered for attending advanced classes or courses of laboratory instruction. True there is the Research Laboratory of the Pharmaceutical Society, but the advantages offered by that institution are necessarily limited.

Mr. Gane then proceeded to criticise the outlay on the Research Laboratory and the direction of the work performed there, which was referred to as being more chemical than pharmaceutical, and he concluded that the manner in which the educational duties of the Pharmaceutical Society are at present discharged might be improved upon.

He then continued as follows:—

And now to consider how those duties may be better performed. In the first place, we must now clearly what we want, and then cast about for the best means of attaining the end in view. It seems to me that two things are wanted: greater educational facilities for students, and secondly,

some facilities for those who have qualified and desire to extend their studies beyond the ordinary school courses.

The means by which those ends may be attained are matters not so easily disposed of, but I venture to lay before you suggestions for certain innovations which seem to me to be practicable, and, I think, would effect the desired improvement. With regard to affording greater advantages to students, of late years we have heard a great deal about a curriculum for pharmaceutical students. As to its advisability I shall say nothing, but what I want to point out is this—given a curriculum, where are the schools in which such curriculum may be carried out? On the Council's own showing there is hardly a pharmaceutical school which is fit to carry out any such project, and it seems to me that before we talk of a curriculum we should take care that there are schools and teachers capable of carrying it out thoroughly. Complaints are rife as to the unsatisfactory state of most schools of pharmacy, but hitherto no attempt has been made to provide better. A scheme such as that suggested by Dr. Symes some years ago would seem to be the easiest way out of the difficulty. Existing schools, where suitable, could be utilised, and any such, when in receipt of a grant from the Pharmaceutical Society ought to be periodically inspected by officials of the Society in order that the work might be well carried out. A grant of £100 each to ten schools situated in the provinces or in London should be amply sufficient to enable those schools to be self-supporting, and to offer good education to students, combined with good teachers drawn from the ranks of pharmacists. That such grants are needed and are useful is shown by a glance at the history of some of the provincial schools. The Sheffield School of Pharmacy, for instance, one of the most promising, owes its flourishing condition largely to the help of the Council in granting it support. The fact that so many schools are inefficient is not due, said Mr. Schacht some time ago, to lack of funds, but to inefficiency on the part of the teachers. That may be so, but does not the one imply the other, and with larger funds better teachers might be obtained. In spite of Mr. Schacht's dictum that provincial education is hopeless, I still hold that the system advocated years ago by Dr. Symes would prove most beneficial to the cause of education. A few schools officered by capable men, and subsidised and inspected periodically by the Council or their agents, would do much to diminish the outrageous system of "cram" employed so largely in the metropolitan schools of pharmacy to-day. This seems to me a point well worthy of discussion, and I put it before you for your consideration, and trust that some good may result from it.

That brings me to the second division of this question, namely, the providing of educational facilities for graduated men. At present we are dependent on our own resources, and on the sufferance of outside colleges for help of this kind, which is too often outside the reach of the average man. What are wanted are, I think, classes for men who have passed their examinations, in advanced technical or applied chemistry and botany; such as will be of practical value to the pharmacist in business. Such a course of lectures and demonstrations should include information about the manufacture of commercial substances connected with pharmacy, such as india-rubber, dyes, earthenware, and the like, and should include practical courses on commercial organic analysis and the analysis of food products, such as would be found of practical use in the course of business. One important subject would be the use of the microscope in practical histology, with a view to promote its use generally

in the examination and recognition of drugs. In view of the important part which bacteriology seems destined to play in the future of medicine, classes in this science might be added with advantage.

Having thus briefly touched upon what I consider the most important points in the subject before us, I leave it to you to discuss, and trust that your deliberations may result in some practical expression of opinion.

In the absence of Mr. Gane, the paper was read by one of the secretaries.

The President said he was sure all present would appreciate the clever manner in which Mr. Gane had handled this subject. He thought it an admirable one for debate, and also that if everyone would endeavour to understand this question of education good results were bound to accrue in the future, for it was the fundamental principle upon which to base all efforts for the furtherance of all trade organisation schemes. He did not see how the Society could relinquish its educational programme, for the providing of education was one of the objects it had in view at its incorporation, the examining function having been imposed upon it subsequently by Act of Parliament. With regard to the Research Laboratory, he quite agreed with the remarks of Mr. Gane as to its having been aimed at too great things, and would have done better service, he thought, if it had undertaken work of a less pretentious character. Evening classes for post-graduate men he very strongly advocated, for personal efforts oftener than not consisted of desultory reading, and at the best the results acquired were incomparably inferior to those ensuing from attendance at lectures and demonstrations.

Mr. Tickle considered the subject of education was of more vital importance than that of trade unionism even.

Mr. Long regretted the evidence there was, as shown by the increased number of cheap schools, of a desire to avoid expense by students, rather than acquire a sound pharmaceutical education. The plea for post-graduate classes had his most earnest support, and should they be instituted he hoped non-qualified men would avail themselves of them.

Mr. Hill thought such classes would confer a great benefit on the ordinary retail assistant, especially if they offered facilities for conducting analyses of food stuffs and other articles submitted to them for analysis. He was also in favour of a reduction of the fees in the Society's school, so as to allow access to the advantages it offered by a greater number of students.

Mr. Crouch was of opinion that it was not altogether desirable to lessen the burdens of students to a greater extent. For by making sacrifices the calibre of a man was much improved. There were many men in circumstances no better off than the average pharmaceutical student who managed to wrestle successfully with the prolonged and most costly curricula of the medical schools.

Mr. Plant considered ample provision existed already for attending night classes, for those held at King's College and elsewhere fully met the requirements of any who wished to develop their education, and further ones, under such auspices as proposed, would not meet with success. He would welcome very heartily any system by which apprenticeships could be registered and masters thereby be compelled to give those bound to them an efficient training.

Mr. W. Moore favoured the making of grants by the Society to provincial schools, which should be

controlled by local associations, such grants being regulated by the number of passes effected, thus embodying the principle which obtained in the South Kensington Science and Art Department.

Mr. Sage stigmatised this payment by results principle, in its relation to education, as the worst ever invented, and very much deprecated the suggestion for its adoption. He thought there were objections to the Society's exercising the dual functions of education and examination, though he had always been in favour of its providing evening classes.

Mr. Hart held that the representative Society was the best body to furnish education for its candidates for examination, and cited the instance of universities discharging both functions.

Messrs. Guyer, Read, and Morley also joined in the discussion.

Mr. Long then moved a resolution to the effect:— "That this meeting of the Chemists' Assistants' Association is of opinion that a course of post-graduate lectures would be appreciated and supported, and requests the Council of the Pharmaceutical Society to consider the advisability of providing such a course during the coming winter."

Mr. Hill seconded the proposition.

Mr. Crouch proposed as an amendment that "laboratory instruction" be included in the course.

This was seconded by Mr. Tapper, who considered that without this any such courses would be incomplete.

Mr. Long having agreed to this addition to his proposal, the President moved, and Mr. Sage seconded the resolution "That this meeting of the Chemists' Assistants' Association is of opinion that a course of post-graduate lectures and laboratory demonstrations would be appreciated and supported, and requests the Council of the Pharmaceutical Society to consider the advisability of providing such a course during the coming winter." The motion being put to the meeting was carried unanimously.

The Secretary was then instructed to forward a copy of the resolution, in its amended form, to the Secretary of the Pharmaceutical Society, after which the proceedings terminated.

THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

The annual meeting of the above Association was held on Wednesday, the 17th inst., the President, Mr. Andrews, in the chair.

The President opened the proceedings with a few remarks, giving a short *résumé* of the work of the past session, and concluded by thanking the members for the kind consideration and assistance he had received from them during his occupation of the presidential chair. He felt sure that the Association was accomplishing the objects for which it was established, namely, the promotion of sound intercourse and unity amongst the members of their calling, and urged upon all members the desirability of trying to induce their friends to join, and thus promote the success of the Western Chemists' Association (of London).

The Hon. Treasurer read the balance sheet for the past year, which was unanimously adopted.

The election of the committee for the ensuing year then took place, and the scrutineers reported that the following gentlemen had been duly elected, viz.:— Messrs. H. Cracknell, A. Dyson, W. A. Goodall, F. Gulliver, J. F. Harrington, J. Holding, J. W. Horsley, J. C. Hyslop, J. H. Mathews, R. H. Parker, A. J. Phillips, W. Pickard, J. W. Taplin, A. Tennant, and A. G. Worsley.

Mr. Cracknell proposed, and Mr. Phillips seconded, that the following addition be made to Rule 7, viz.:—"And any member whose subscription shall remain unpaid after twelve months, and to whom two notices shall have been duly sent, shall cease to be a member of the Association, but shall be eligible for re-election on payment of the current and previous year's subscriptions." This was carried unanimously. Mr. Cracknell then proposed, and Mr. Mathews seconded, that the annual dinner of the Association be held at the Café Royal, Regent Street, on Wednesday, November 21, and that the price of the tickets be six shillings and sixpence. This also was carried *nem. con.*

A vote of thanks was passed to the auditors and scrutineers.

A vote of thanks was also proposed, and carried with acclamation, to the President for his conduct in the chair during the past year, and the President having replied, the meeting terminated.

Provincial Transactions.

MIDLAND PHARMACEUTICAL ASSOCIATION.

INAUGURAL MEETING.

The inaugural meeting of the session of the Midland Pharmaceutical Association was held on the 18th inst., at the Midland Hotel, Birmingham. Mr. R. Darton Gibbs (president), occupied the chair, and amongst those present were Messrs. W. Jones and F. J. Gibson (vice-presidents), Dr. Paul, Messrs. A. W. Gerrard, F. H. Prosser, F. H. Alcock, H. Boucher, H. Culwick, H. S. Shorthouse, H. C. Morris, F. Gibson, C. Page, Alfred Southall, A. W. Southall, J. Poole, E. J. P. Ferriday, F. Barlow, W. Burton, W. Scott, C. Thompson, W. McCombie, F. Dale, T. Donald Watson (London), and George E. Perry (hon. sec.).

The President, on behalf of the Association, gave a hearty welcome to Dr. Paul and Mr. A. W. Gerrard, whose presence, he said, was highly appreciated. Nothing was better calculated to keep alive that Association and to infuse enthusiasm amongst them than such visits on occasions like that. He then delivered his address, of which the following is an abstract:—

INAUGURAL ADDRESS.

BY R. DARTON GIBBS.

To-day we make a start on a new session in connection with this Association, a session which I hope will not be of less importance than those which have passed, and one I also hope you will each and all contribute to make a success.

It is on an occasion like this that it seems desirable to take a glance over the work this Association has done in the past, and what it is now doing, to see how far short we are of the standard originally fixed, and to make a careful estimate of its future possibility of usefulness.

In order to do this it is necessary to set very clearly before ourselves the aims and objects of such an association, and this, to my mind, does not appear to have been done with that distinctness which is necessary. Now the power of association is in direct proportion to the clearness with which associated interests and the end in view is defined.

That some value is attached to associations is evidenced by their increasing number in every direction, for every conceivable purpose, by the length of time this and other associations have been in existence, and by the fact that collective opinion and action can hardly be obtained without them.

In turning one's attention to the past, the first thing to notice would be that 1868 saw the passing of the Pharmacy Act, and 1869 the formation of the Birmingham and District Chemists' Association. Thus we have had twenty-six years of the working of this Act, and twenty-five years of the influence of this Association. Now twenty-five years is, I venture to think, sufficient time to give a trial to, and prove the necessity and desirability of, a society, and the present seems an opportunity for casting a glance round and endeavouring to see if the results justify its creators. Well to some, and I include myself among the number, the results seem poor. When you think of the number of meetings and discussions that twenty-five years have produced, you would at once estimate that the Association is well up-to-date with ideas and principles, and that we became a force by our unity and readiness for action; but as far as my experience goes we are as far from being in accord as ever we were, and quite as far from accomplishing or having anything to accomplish. Still I would not deny that this Association has been of real use. I see work done, quietly it is true, but none the less done. The interests of the trade, an expression I often come across, seems to have been sought, at first by the publication of a retail and dispensing list, which seems to have been of equal value to the funds of the Association as to the user, for I find its sale brought £24 to the funds of the Association during the first three years, and how much more I do not know. You will not call that a failure. Then there were many little annoyances, such as licences for storing petroleum, the Storage of Poisons Bill, and many other matters, in a way small yet annoying, which this Association dealt or helped to deal with successfully, but the largest share of work, which I consider of greater value, is what is called social. It has brought together men engaged in the same class of work, who at one time looked upon each other with suspicion, but who now feel that friendship and commerce may go hand in hand, with much to gain and nothing to lose, and who can estimate the value of this and other societies in helping rather than hindering each other; yet with all this we never seem to have created any policy, we seem to have accepted things as we find them, and believe what is right.

If we are slow in attack, we have many times shown ourselves quick and able in defence, for I find in the past, whenever any interference came, from whatever quarter, pharmacists were quite able to take care of themselves, and it needed but activity on the outside to stir up activity within. Hence I infer that matters cannot be so very ill-arranged, yet I find discontent everywhere. There is a general feeling that for some undefined reason we do not share in the general prosperity; that whilst the wealth and population of this city go up year by year, the number of pharmacists, if they do not grow smaller in number, become poorer in pocket, and this in spite of the marvellous development of the science we claim to know—chemistry. Yet the race is being run and won by men having to my mind less opportunities. But you may suggest that a man should seek and find work and success within what is called legitimate pharmacy. I am not clear what legitimate pharmacy is, but I am quite clear that if the whole of our members decided tomorrow to limit themselves to what is generally understood to be legitimate pharmacy, their wives would not be long in finding it out. I would rather, therefore, suggest that, in the exercise of your work, you are storing up valuable utilities which you should place at the disposal of mankind, bearing in mind that the greater their value the more you will obtain in exchange. I wish to press this point, because I find people are ready to blame everything and everybody

except themselves, or to seek success not by raising the value of their services, but by seeing how far they can diminish the price of their commodities.

The pharmacist has lost his old character, for now he can buy everything he wants in its fabricated condition far below what it formerly cost him to prepare. *Tempora mutantur, nos et mutamur in illis.* These economic changes you cannot ignore, but they do not stand alone. Other changes are taking place affecting our position, and what could be of greater use to us than an association like this, where we can from time to time take stock, and seek among ourselves for guidance and help.

One of the greatest hindrances we have to deal with is want of unanimity, but we have not had what one might term a natural growth. The early chemist or druggist grew, as you are aware, out of the antagonisms of the physicians and apothecaries. We rose to our present position not because the country demanded it, but to save ourselves from being crushed by the apothecaries, and it was entirely upon our own account we undertook the formation of the Pharmaceutical Society, having for its object the union of the members of the trade into one body, the protection of their general interests, and the improvement and advancement of scientific knowledge by education, examination, registration, and representation.

What Buckle calls the protective spirit is to be found everywhere, in our craft as much as elsewhere. It is the first thing a man seeks for who forgets everyone but himself. Who is it that does not want his special calling protected, but always at the expense of someone else. I have little faith in what the State can, or will, or should do. If there are to be any restrictions they must not come from us, but be imposed by the State in the interest of the community. The Pharmacy Act and the Sale of Food and Drugs Acts spring from a public demand for protection, and if I were addressing the public I should say that the poisons schedule might be extended to include all powerful drugs which are prepared for and intended to be used as medicines, without feeling that I was acting in opposition to the public good.

Having, then, given up our ideas of seeking State protection, let us turn our attention to matters we can well afford to discuss with great hopes of success, the title and the qualification. The State has no objection of granting exclusive titles to corporations which, acting for the general good, seek to raise the status of their profession. Now physician, surgeon, barrister, and solicitor are clear and distinct titles, but when you come to pharmacy what do you find? First, names assumed before the incorporation; second, those assumed by the incorporated society; third, those which the Pharmacy Act of 1869 took into consideration. Then you find also two meanings to the word, depending upon whether you refer to the person or the thing; thus chemist may mean a man having a knowledge of chemistry, or it may mean a wholesale chemist, a cash chemist, an operative chemist. It may imply a trade, or it may mean a man registered under the Pharmacy Act. So I hold that the word chemist is not much good as a distinguishing title. Neither is it clear whether the word druggist applies to a trade or the qualification of the person. Now what we want is a personal qualification. A Minor man should have one clear title, a word not capable of various interpretations, and the same applies to the Major. By these means the public really would have a chance of understanding our position, but I defy them to do so now, when they see "chemist by examination," "registered chemist," "chymist," spelt with a "y," "chemist and druggist," "pharmacist," "pharmaceutical chemist," "M.P.S.," "pharmaceutist," "family chemist," "experimental chemist," "operative chemist." I have no doubt you could add many more public-bewildering names.

Then I hold that the examinations of the Pharmaceutical Society are of too low a character. Beginning with the Preliminary, and comparing the advances of scientific knowledge and the eagerness of medicine to take up the newest and most advanced ideas, unless the Society sets about increasing the stringency of the examination and extending the subjects, you may expect to find that medicine will draw her supplies not from the half-educated pharmacist, but from outside specialists.

I now come to that august body, the Pharmaceutical Society. Originally a trade society, a self-imposed educating and examining body, and a benevolent society, the world was able to appraise its worth, and I believe pharmacists have done so, but add to this a State control and the 1868 Act, and you had better not think of the consequence if you do not want nightmare. To-day the public are protected by the Pharmacy Act, and by a society comprising about one-fifth of the qualified pharmacists, the remaining four-fifths finding it cheaper to look on. Is that right? Then ought pharmacy to pay at all for giving effect to an Act of Parliament passed in the interest of the community, which, if not in the interest of the community, ought not to have been passed at all. What right has any society to claim the position of head of English pharmacy which is supported by so small a minority. The Society will never be able to assume that title or have any life until it is controlled by the whole body of pharmacists, not in return for a guinea subscription, but by virtue of their qualification, and I cannot suggest a subject requiring your very careful consideration that is of more importance to pharmacy and pharmacists than seeking to remove those hindrances to success which surround the Pharmaceutical Society.

My next point will be the relationship of pharmacy to medicine. Pharmacy cannot hold an independent position; you cannot offer your services to the public without falling foul of the Stamped Medicines Act, hence you must offer them to medicine. Every improvement you effect increases the armament of the physician, therefore to the medical world you must go. If this is so, then I contend you have omitted to seize many opportunities for becoming closer acquainted. Take the British Pharmaceutical Conference, which year by year has followed the British Association for the Advancement of Science, whilst the British Medical Association has been left severely alone. What opportunities for exchange of information between members of that body and ourselves would exist by allowing such as will to attend our discussions. Then it has always seemed to me that pharmacists neglect many other opportunities of cultivating an acquaintance with their local medical practitioners, of seeking to render little usefulnesses, of providing somewhere other than the shop counter a place for little social observances and conferences. I imagine in this way the pharmacist would discover many wants that he would have the means and abilities of supplying, to the doctors' and their patients' advantage, and improving his knowledge of medical requirements at the same time. To-day these things are neglected. Another hindrance to our social success lies in the out-of-date ideas of working hours. I am told—and my experience in the past would support it—that seventy to ninety hours per week are devoted to business. This is a factor of far-reaching importance; it acts as a check upon smart men coming into that business, and if they come in it drives them out. You must offer a man considerable inducement to accept these hours against the forty-eight to fifty-four hours' standard. Improve matters in this respect and you will get a different type of apprentice, a different type of assistant, and the whole craft becomes socially raised.

I have now pointed out the mistake of seeking protection from the State, the desirability of a clearer title, of increasing and extending the examination, of separating the duties of the Pharmaceutical Society and giving controlling power to the whole of the qualified pharmacists, of drawing closer to medicine, and, lastly, making the hours and conditions of labour more attractive.

Before bringing my address to a close, I will make a few suggestions to the younger men who are coming into pharmacy. The possibilities of usefulness are as great in pharmacy as they are in any other department of human activity, and that usefulness consists in seeking for and satisfying wants. Every desire is a want, and everything which conduces to the satisfaction of a want is a utility. Wealth is the expression of the mass of utilities. Keep that before you and you will see that your life will consist of exchanging utilities. The greater the number and value of your utilities the greater the number and value you can get in exchange. In pharmacy, as elsewhere, you want energy and perseverance, knowledge and reliability; with these nothing can stop you from realising life's best hopes.

Dr. Paal said he anticipated he should have full support in proposing a vote of thanks to the President for his address. Mr. Gibbs had referred to the value of the Association, and he had brought before them a number of subjects that might well be dealt with by that or any other association of pharmacists, and chemists and druggists, to their advantage, and the advantage of their fellows elsewhere. Those topics upon which he had touched would take too long to enter upon then, but there was one he thought specially deserving of notice, and that was upon the value of associations of that kind for the sake of establishing personal acquaintanceship. It was not so much the work of paper-reading and discussions at the periodical conferences and meetings that took place that was valuable, as the opportunity they afforded to establish personal intimacy between persons engaged in the same occupation and having a certain amount of sympathy one with another in their pursuits. That was an influence that could be well and usefully exercised by associations of that kind, and he thought that was one of the most interesting points to which their President had referred.

Mr. Gerrard, in seconding the motion, said that he had great pleasure in coming to Birmingham to listen to his old friend Mr. Gibbs in his position of President of their Association. It was not usual to criticise the President's address, but he was sure there were many points in the address which might be taken up by them at future meetings of the Association. If they could come to an agreement upon one or other of those points and could get other local associations to agree with them and send deputations or resolutions to Bloomsbury Square and influence the Council there, they would be doing a really good work for themselves and for the whole body of chemists and druggists. If the Council of the Pharmaceutical Society did not respond to them in the matter, it was open for them to elect a new council. There was one point upon which he begged to differ. Mr. Gibbs thought that a qualification ought to entitle a man to a vote. He (Mr. Gerrard) asked them as members who subscribed their money and gave their time and attention to that Society, if they would like men who had no sympathy with them to come in and vote away their funds, whilst paying not one farthing to their Society. It did not seem a right thing to say because a man got a qualification he should have a vote and be capable of upsetting that which was established on a fairly firm basis. With

reference to protection, he agreed that they were badly off so far as protection for their trade was concerned. He thought they should ask for better protection for their title, and as they were looked upon by the public as the only legitimate dispensers of physicians' prescriptions, he thought, under the circumstances, they had a right to protection so far as the dispensing of medicine was concerned. On the other points he was in thorough agreement with the President, and he did think there was a hope for them if they met together and discussed those questions of education, and if they were determined that the education of the pharmacist should be improved, and especially the early education. He felt it was not too much to ask that the preliminary examination of the Pharmaceutical Society should be extended. They would then be able to draw their apprentices from a better class of society, and in ten years they would see a great improvement in their position and bring themselves more into touch with the medical and scientific classes.

Mr. Alfred Southall supported the motion, and said what they had been told was very much to the point. They might at some of their future meetings discuss the questions brought forward. He was not inclined to take quite so gloomy a view of the chemist and druggist's position as their President, and did not think they need be so much discouraged.

Mr. Gibson (Vice-President) also supported the motion. He said that he believed a great deal of what they now complained of was due to the lack of association among chemists and druggists.

The motion was carried unanimously.

The President said he had spoken with true sincerity, and he hoped in their meetings later on they would have an opportunity of discussing what he had advanced. If they could prove what he had suggested to be wrong he should not be offended. It was necessary for an association to have a policy, and that was the reason he had formulated the opinions he had.

The remainder of the evening was devoted to social intercourse.

LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

The inaugural reunion of the present session of the Liverpool Pharmaceutical Students' Society was held on October 18 under favourable auspices. Mr. R. H. Mitchell, president, occupied the chair, and there was a large attendance of members and friends. The proceedings were of a most sociable character, largely owing to the efforts of the secretary, Mr. G. M. McLoughlin. The gentlemen who chiefly contributed to the programme were Messrs. S. Arthur, P. Stone, P. Waring, A. R. Field, J. Shacklady, W. L. Mitchell, J. L. Birchall, and Evans. During the evening the president spoke of the advantage accruing from such meetings, by bringing members of the trade together and giving them an opportunity of exchanging views, and so tending to create a better feeling. With regard to the work of the session a capital syllabus had been prepared, and the session promised to be a very successful one.

MEETING OF PHARMACY STUDENTS AT NEWCASTLE-UPON-TYNE.

The past and present students of the North of England School of Pharmacy, with a few friends, held a social meeting on Friday, October 19, at the Café Royal, Nelson Street, Newcastle-upon-Tyne. There was a company of fully sixty present, and a very enjoyable evening was spent.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

INAUGURAL MEETING.

The first meeting of the session was held on Thursday, Oct. 18, with a fairly good attendance of members, when Mr. W. L. Currie presided, and Dr. D. C. McVail delivered the opening address, an abstract of which is here given.

INTRODUCTORY SESSIONAL ADDRESS.

BY DR. D. C. MC VAIL.

When your secretary did me the honour to ask me to address you to-night, and did not suggest any subject in particular, you will understand that I have been in considerable difficulty as to what I could talk about. It would be impertinent on my part to give you advice, or even to offer suggestions on matters in which you are specialists, and therefore I have had to consider what there may be yet remaining of common ground between the physician and the pharmacist, as it is in this border country that useful conference may most suitably be held. Year by year this "no man's land" is lessening in area; more and more definite, as time goes on, are becoming the dividing lines between your work and ours. This is inevitable. Advancing science is increasing rapidly the field in both departments; fewer and fewer doctors dispense medicines to their patients, and fewer and fewer pharmacists prescribe as well as dispense. In Scotland this division of labour has always been more marked than in England, and our advancement in this particular is more rapid even now than it is south of the Tweed. You benefit by it, so do we, and the public gains more than either of us. In the near future the Scottish medical man will not be a pharmacist at all, and the educated pharmacist will have too intelligent an appreciation of the manifold work that lies within his own domain to seek to wander into the province of the medical practitioner. The great common end of the prescriber and dispenser is to relieve suffering and prolong life. In the fulfilment of this ideal duty your way is more easy than ours, and you have attained a greater perfection than we have. Four fundamental obligations you have to fulfil. Perfection in the preparation of every article as regards the accuracy of its contained ingredients, absolute purity of every preparation, rigid exactitude in dispensing every prescription, and such a knowledge of dosage as will enable you to detect any blunder that the prescriber may inadvertently commit. But beyond the fundamental qualifications you confer many benefits on the physician. You guide him as to what is compatible in the ingredients of his prescriptions. You point out to him suitable combining administrative media, and you assist him in rendering nauseous doses elegant in appearance and pleasant to swallow. But much more still you have accomplished, and are accomplishing, and that not in all respects to your own immediate pecuniary benefit. Take, for example, the introduction of tablets in recent years, and particularly those for hypodermic use. These are the most economical preparations you have ever given us, and they deprive you of many a prescription that otherwise would come to you. Their effect is so immediate and, so far as relief of pain is concerned, so certain, that frequently on a night visit or other call of urgency the little injection is all that is required. In former days there would have been the internal administration of a bottle in repeated doses, and external applications that necessarily brought profit to the pharmacists. Potent treatment

by such minute doses has been rendered possible by the great work you have done in the separation of the alkaloids, and the combining of these with soluble salts; and the present rate of progress is likely to advance with even increasing velocity, and all unpleasantness in the administration of medicine cease.

Forming a very special department in your work is the splendid help you give to the surgeon in the sterilised and antiseptic dressings with which you supply him, and how great complication is giving way to increasing simplicity. Just before Lister's great discovery, surgical dressing in Glasgow was certainly sufficiently simple, wet lint and oiled paper for all wounds in all conditions. Very simple, but in crowded city hospitals often most disastrous.

Carbolic acid was Lister's first antiseptic, the method of its application grew in complexity, other germicides followed in succession, and now, at the end of twenty-eight years, Lister, as his last word on the subject, advises reliance mainly on carbolic acid still.

Well, gentlemen, as I have said before, your share in the work of healing is most admirably carried out: every demand made on you is promptly met, and naturally the question suggests itself: What has the physician been doing during the past generation? Has he advanced his art as you have advanced yours? To this question an answer largely qualified alone can be given. The call made on you for exact dispensing ought to imply on the part of the prescriber corresponding exactitude of knowledge as to the effect of the prescription. In an ideal state of medical science the reading of a prescription would convey at once a clear idea of the disease that is being treated. That we are far removed from this none know better than you. In a few instances you may make a fairly accurate guess, but in the great majority of cases neither the dispenser nor any other prescriber could from the prescription state the disease. For this uncertainty no share of responsibility attaches to you; with us lies the obligation to attain more exact knowledge of the influence of drugs on the body. The position is difficult, and baffles still the greatest men, and there are many great men in the profession of medicine. There is still truth in the old taunt that we throw drugs of which we know little into bodies of which we know less. Medicine is essentially an experimental science, but doctors in all times, to escape from the difficulties which this entails, have been prone to form theories of disease from which, by easy deduction, they might formulate rules of practice. In old days disease was regarded as punishment, divine or diabolic; and prayer to deities and saints, visitation to shrines, penance, charms, and magic constituted the treatment inferred from that theory of disease. Drug giving was but supplementary to the methods mentioned; medicines were given to help in driving out or counteracting the influences of evil spirits. Physicians were priests, and drugs were their bell, book, and candle. The charm still survives in the hieroglyphic which you read as the capital R at the top of every prescription. It is long since the physician has been disrobed, but he still persists in theory, although no great advance in medicine has ever resulted therefrom. Every real advance in the science and art of medicine has been due to the too-some observation of minute particulars and the extremely arduous inductive arrangement of numerous and apparently conflicting details. Medicine was old in the world, it was hoary with the antiquity of thousands of years before even the most learned physician had the most rudimentary knowledge of the structure of the body.

At the conclusion of the address, a unanimous vote of thanks was accorded to Dr. McVail.

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

DEATH FROM IMPROPER USE OF CARBOLIC ACID.

George Hill, aged 56, of Hill Lane, Southampton, a retired miller, died on Tuesday, October 9, after accidentally burning his feet by soaking them in a strong solution of carbolic acid. Medical evidence attributed death to affection of the kidneys caused by absorption of the acid. Verdict: "Death was due to disease of the kidneys, caused by the improper use of the acid."—*Hampshire Advertiser*.

CASE OF CHLORODYNE POISONING.

A man, name unknown, about 25 to 30 years old, was found unconscious on Hayward's Heath on Tuesday, October 9, and died shortly after being removed to Cuckfield Union Infirmary. Three chlorodyne bottles were found by his side, and medical evidence showed that deceased probably died from narcotic poisoning. Verdict: "Suicide."—*East Sussex News*.

ACCIDENTAL POISONING BY LAUDANUM.

William Rogers, aged 32, of 50, Blanket Row, Hull, described as a chemist, but not on the register for 1894, died on Friday, October 12, from the effects of laudanum taken in mistake for tincture of rhubarb. Verdict: "Death from misadventure."—*Eastern Morning News*.

POISONING BY OXALIC ACID.

Edward John Hanbury, of Essex Street, Kingsland Road, Islington, a slipper maker, died on Friday, October 12, as the result of drinking whisky in which he had dissolved oxalic acid. Verdict: "Suicide while of unsound mind."—*Koho*.

POISONED BY A LINIMENT.

Lydia Caroline Hales, aged 25, drank four ounces of liniment on Saturday, October 13, and subsequently died. Verdict: "Suicide during temporary insanity."—*Morning Leader*.

SUPPOSED POISONING BY ARSENIC.

Dr. Thomas Evans Hughes, aged 36, of Wingfield Crescent, Llanbradach, was found dead in bed on Saturday, October 13, with a small phial supposed to contain arsenic by his side.—*Western Mail*.

ACCIDENTAL POISONING BY CARBOLIC ACID.

William George Herbert, aged 2, of Marshall Street, Leeds, died on Saturday, October 13, after drinking carbolic acid left in a bottle in bedroom fireplace. Verdict: "Accidental death."—*Yorkshire Post*.

POISONING BY OXALIC ACID.

Mary Ann Kelly, aged 26, of Chatham Street, Widnes, died on Sunday, October 21, from the effects of oxalic acid solution, taken in mistake.—*Liverpool Mercury*.

SPIRIT OF SALT FOR FRUIT SYRUP.

William Frederick Field, aged 15, of Willesden, died on Sunday, October 14, as the result of drinking

spirit of salt in mistake for fruit syrup. Verdict: "Death from misadventure."—*Daily Graphic*.

POISONING BY SPIRIT OF SALT.

Arthur Patrick Hill, aged 40, of Hall Place, Paddington, a house painter, died on Tuesday, October 16 after drinking a large dose of spirit of salt. Verdict: "Suicide while of unsound mind."—*Morning*.

ACCIDENTAL POISONING BY CHLORAL.

Dr. W. L. Emerson, sen., aged 72, of Leicester, formerly analyst for the county of Leicester, died on Wednesday, October 17, as the result of an overdose of chloral. Verdict: "Death from misadventure."—*Nottingham Guardian*.

DEATH FROM OVERDOSE ON LAUDANUM.

William Clelland, aged 40, of Burntisland, died on Thursday, October 18, from the effects of an overdose of laudanum.—*Scotsman*.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

WHITE WAX OR PARAFFIN?

At the Wolverhampton Police Court on Friday, October 19, before Mr. N. C. A. Neville, Charles Frederick Lloyd,* trading as a chemist at 70, Darlington Street, was charged at the instance of Mr. G. F. Allwood, inspector of food and drugs for the borough, with selling a certain drug, to wit, white wax, which was mainly paraffin, and not of the substance and quality asked for by the purchaser.

Mr. Allwood stated that the charge was taken under section 6 of the 1875 Act. On July 23 an assistant, named John Allen, in the weights and measures office, called at the shop of defendant and asked to be supplied with a quarter of a pound of white wax, for which 3½d. was charged. The inspector afterwards went to the shop and divided the article in the usual way, and a sample was submitted for analysis. On September 5 a certificate was received stating that the wax was not according to the British Pharmacopoeia, but was mainly paraffin, of which 90 per cent. was found.

Similar charges were also laid against Henry Hudson,* described as a chemist, of 1, North Road, and Phillip George Godsell, chemist and druggist, Chapel Ash. Mr. T. G. Greensill represented Mr. Godsell. On July 23 a ¼-lb. of wax was purchased from Mr. Hudson, for which 10d. was paid, and on analysis it was found to contain 75 per cent. of paraffin. It was on July 20 that sixpennyworth of wax was purchased from Mr. Godsell, and the analytical return for this was that it contained 95 per cent. of paraffin.

Mr. Greensill remarked that they could not deny the analyst's returns; but they sold the article as received from the wholesale chemists. He understood that it was an American production, made in Boston, and described as mentioned in the British Pharmacopoeia. Mr. Godsell bought his business from a Mr. Coleman, and he sold the stock then purchased. He believed this was the first time wax had ever been taken, and it was a hard case.

Mr. Lloyd said they bought the article in good faith, and sold it in like manner, but Mr. Neville said that if wax was ordered that must be sold, and each of the three defendants was fined 20s. and costs.—*Express and Star*.

* This name does not appear on the Register of Chemists and Druggists for 1894.

Notes and Queries.

VASELONE.

[778.] "Can you give me any information concerning a substance called 'vaselone'?"

Vaseline is an artificial product intended as a substitute for paraffinum molle. It is described as a solution in neutral mineral oil of stearone (5 per cent.) and margarone (15 per cent.), prepared by distilling stearin and beef suet respectively with lime. A neutral product so obtained is a white, odourless ketone, unaffected by acids. (See Watt's Dictionary of Chemistry, IV., p. 513).

A NEW PILL COATING.

[779.] In the case of pills required to pass through the stomach unaltered, Waldstein prefers a coating made from a mixture of shellac and salol dissolved in alcohol. Methylene blue administered in pills so coated was found in the faeces and urine, though it was proved that the pills remained undissolved in the stomach (*New York Med. Journ.* and *B.M.J. Epit.*).

PEPSIN WINE.

[780.] This preparation is official in the German Pharmacopoeia, glycerin being employed as a preservative. In the second edition of that work the formula was as follows:—Pepsin, 50 Gm.; glycerin, 50 Gm.; water, 50 Gm.; acid hydrochloric, 5 Gm.; white wine, 1845 Gm. That in the later edition, however, is different, thus—pepsin, 24 parts; glycerin, 20; acid hydrochloric, 3; water, 20; syrup, 92; tinct. aurant., 2; sherry, 839, or enough to make 1000 parts. The first four ingredients are directed to be mixed together and allowed to stand eight days. Filtration is then performed, and the other ingredients are added. Schmiedeberg objects to the addition of glycerin as being injurious, and other writers have objected to the use of wine, alleging that the alcohol present might hinder the action of the ferment, though no satisfactory evidence appears to have been produced on either of these points. The addition of syrup is strongly recommended by several of these individuals, but a writer in the *Bulletin de Pharmacie de Bruxelles* suggests that the proportion of syrup should never exceed 20 per cent., or it may check the digestive action of the pepsin, Vulpinus having shown that whereas albumin, 10 Gm., may be digested in one hour by pepsin, 0.10 Gm., in the presence of hydrochloric acid, 10 drops, diluted with water, 100 Gm., the addition of sugar, 10 Gm., prolongs the period of digestion to five hours. The presence of alcohol, 1 Gm., or sweet wine, 4 Gm., prolonged the period to one hour and twenty minutes only.

PALATABLE EXTRACT OF CASCARA.

[781.] Experiments have been undertaken by Frank Edel with the view of ascertaining the most satisfactory formula for this preparation, the basis of the experiments being the following, which he describes as furnishing, in his experience, "the best bitterless extract":—Cascara sagrada in coarse powder, 16 oz.; calcined magnesia, 1½ oz.; water, 18 oz.; alcohol,*

12 oz.; dilute alcohol,* q.s.; glycerin, 2 oz. The cascara and magnesia are intimately mixed, moistened with the water and macerated for several hours. Then pack in a percolator, macerate for forty-eight hours, add the alcohol, and macerate twelve hours longer. Next, percolate with dilute alcohol till exhausted, reserving the first twelve ounces. Recover alcohol from bulk of percolate and evaporate to soft extract, which dissolve in reserved portion of percolate and add glycerin to make sixteen ounces. Various modifications of this process were tried, in the last described percolation being allowed to proceed to exhaustion and, after the recovery of alcohol, four ounces of glycerin added, the whole being then reduced by evaporation to twelve ounces. To complete the preparation liquorice extract, 4 oz. (*vide Note 782*); fennel oil, 6 drops; and saccharin, 24 grains, were added. "A satisfactory sweetness was produced, and the cascara was completely masked." The resulting product is described as "an extract of fine keeping qualities and of elegant appearance," besides being efficient from the point of view of medicinal activity (*American Druggist*).

LIQUID EXTRACT OF LIQUORICE.

[782.] Some years ago, G. H. C. Klie recommended a liquid extract of liquorice made from the stick extract by extraction with cold water. Frank Edel has used this preparation for the past five years, and suggests its general adoption. It is made by packing stick extract of liquorice, 16 oz., in small pieces, in a percolator, with alternate layers of rye straw, and allowing to macerate with cold water for twenty-four hours. Then run off liquid and put aside in a cool place. Again fill percolator with water, and macerate for twelve hours. Run off liquid, mix with former percolate, and evaporate on a water-bath to twelve fluid ounces. Finally, add glycerin, 2 oz., and alcohol, 2 oz. (*American Druggist*).

Reviews and Notices of Books.

MYXEDEMA, CRETINISM, AND THE GOITRES. By EDWARD T. BLAKE, M.D., M.R.C.S. Pp. i-xi, 1 to 89. 3s. 6d. Bristol: John Wright and Co.

Twenty years ago men learned in branches of science other than medicine were wont to complain that our doctors paid too little heed to the causes of disease, while they went on tinkering at its effects. Now, happily, no one can bring this charge against the medical profession. Pasteur, with a mind untrammelled by dogma, passed from chemistry to biology, and in biology found in its highest province—medicine—full scope for his great genius. Nor is there need to recall the work of Koch and Lister, and the now great school of bacteriologists, to realise that we have seen a revolution accomplished in medical thought. Whilst the methods invented by Koch have enabled bacteriology to advance by gigantic strides, the study of the pathogenic sporozoa, necessarily conducted by other methods, has been slowly but surely gaining

* Alcohol, U.S.P., contains 91 per cent. by weight of absolute ethyl alcohol.

* Alcohol dilutum, U.S.P., contains 41 per cent. by weight of absolute ethyl alcohol.

ground since the discovery by Laveran of the sporozoa of malaria about 1880.

The author of the handsome little volume before us takes what has been proved of other diseases to form a basis for suggestions as to the probable nature of some affections of the thyroid gland. The essential identity of sporadic cretinism, myxedema, and kakexia strumipriva is brought into relief, and the marvellous success of the treatment of these affections by the administration of animals' thyroid glands in some form or other is well described. From the nature of the work undertaken by the author, many pages of the book present a confusing haze to the mental gaze of the reader. Some passages might be considered rather too hazy. We may instance the following: "Graves' disease in women is an auto-toxsis, most frequently caused by the absorption of purulent products, that process being aided rather than induced by the toxins of terror and shock." The toxins here alluded to have yet to be discovered in a form appreciable to chemists, so that at present they must rank with the hypothetical entity enshrined in the word "melancholia." In spite of a few such lapses into looseness of thought, the author has produced a work which will be welcome to thinkers in the medical profession.

STAMMERING, STUTTERING, AND OTHER SPEECH AFFECTIONS, THEIR CAUSES AND CURE. By W. ABBOTTS, M.D., M.R.C.P., M.R.C.S. Lond. Pp. 1 to 62. 1s. London: The Savoy Press.

"A great book," to use the words of the old Greek writer, is often a great evil." This is an extract from the preface of the work before us. Dr. Abbotts' book is very small. The sorrows of those afflicted with stammering are pictured in a page of blank verse, descriptive of an extreme case, and attributed to M. F. Tupper. We are told that many pretentious quacks profess to cure stammering, but only disappoint their dupes. Dr. Abbotts thinks the proportion of stammerers to the whole population of England has increased of late years. The book contains a certain amount of information, but nothing new. The title of the work seems to imply that all cases of stammering are curable, and there is nothing in the somewhat vague references to the author's cases that tends to remove the impression that this is without exception the author's experience. Other medical men who have written on the subject have not been so fortunate.

Indeed, with the best of advice the majority of stammerers stammer on the same, only the minority are curable, or can be taught to mask their infirmity: such is the experience of many able physicians.

Books, etc., received.

ASTHMA AND CHRONIC BRONCHITIS. By JOHN C. THOROWGOOD, M.D., F.R.C.P. Pp. i-vii. 1 to 136. 4s. London: Baillière, Tindall, and Cox. From the Author.

CALENDAR OF THE DURHAM COLLEGE OF SCIENCE, Newcastle-upon-Tyne. Session 1894-5. Pp. 388. From the College.

New Books and New Editions.

The following are amongst the most recent scientific publications:—

AN ILLUSTRATED DICTIONARY OF MEDICINE, BIOLOGY, AND ALLIED SCIENCES. By GEORGE M. GOULD, A.M., M.D. 40s. Baillière, Tindall, and Cox.

PHOTO-MICROGRAPHY. By Dr. HENRI VAN HEURCK. English Edition. Re-edited and augmented by the author from the fourth French edition, and translated by WYNNE E. BAXTER. Illustrations. Crosby Lockwood and Co.

ORGANIC CHEMISTRY. By A. BERNTSEN, translated by GEORGE M'GOWAN. Second English edition, revised and extended. 7s. 6d. Blackie and Son.

PRACTICAL PHYSIOLOGY OF PLANTS. By FRANCIS DARWIN and E. HAMILTON ACTON. Illustrated. 6s. Cambridge University Press.

THE RISE AND DEVELOPMENT OF ORGANIC CHEMISTRY. By CARL SCHORLEMMER. Revised Edition, edited by ARTHUR SMITHELLS. 5s. net. Macmillan and Co.

ELEMENTS OF METALLURGY. By W. JEROME HARRISON and W. J. HARRISON, Jun. 2s. 6d. Blackie and Son.

Correspondence.

SCHOLARSHIP AND PRIZE REGULATIONS.

Sir,—Having noticed an article in the Journal of October 18, by Charles B. Allen, on the scholarships and prizes which are open to the pharmaceutical student, in which he laments the paucity of entrants, may I suggest that the regulations are to blame and not the students. Taking the Herbarium prize as an example, the limit of age is fixed at twenty-one years. At that age the majority of students are just beginning to take an interest in whatever science has engaged their special attention. Then a large number of apprentices are engaged in the large towns and cities, and can only get into the country once a week for a few hours. What opportunity have these young fellows to make a collection of plants for competition? Raising the limit of age would give all these a much better chance, and would not have any disadvantage. Might I suggest that to raise the limit to twenty-five years and open the competition to all students of the Society who have not passed the Minor would result in a much better class of collections, and would at least double the number of entries.

Harrogate.

THOMAS W. CLEAVE.

THE REVISION OF THE BRITISH PHARMACOPOEIA.

Sir,—I sincerely hope to see Mr. Ince's suggestions re nomenclature adopted. I have noticed the inconsistencies constantly; they are eyesores. I should also like to see substances given Latin names dissimilar to the English where possible, so as to render prescriptions unintelligible to anyone but the doctor and the chemist. I think both medical men and pharmacists will agree that this is desirable. At present a patient can always tell when there is opium in his prescription; alter it to "thebaicum," and he is fogged at once. Antimony should be stibium. Sodii carbonas should be natrii carb. Potassium in Latin should be kalium. In many other cases, as ipecacuanha and senna, a change at present would be perhaps revolutionary. Latin synonyms might, however, be gradually introduced thus:—Tinct. buchu—syn. tinct. barosmæ. Ext. of malt if included should certainly be ext. bynes, and not extractum malti. When the '67 cardamom was altered to the '85 cardamomi semina, a good principle was started, which requires further application. Single names for drugs are too empirical. Cubeba should be cubebæ fructus; copaiba, copaibæ oleo-resinum; scammonium, scammoniæ gum-resinum; zingiber, zing. rhizoma; borax should give place to pyroborate of sodium (natrii pyroboras, Latin); sinapis to sinapis farina, and many others similarly.

Amongst other desirable changes:—Hydrochlorates of morphine and other alkaloids should be termed hydrochlo

rides. Linseed meal, which is never used, should be omitted and crushed linseed (*lini semina contusa*) substituted. (Oleate of mercury should be latinised as *hyd. oleas*, not *oleatum hydrarg.* The same with the oleate of zinc and its ointment. Resins should give way to resinum. *Pulv. scammonii* co. should be *pulv. scammoniae* co., as it is now made from *scammoniae resinum*. Petroleum spirit (appendix) would be more systematically called "volatile paraffin;" it would then fall in line with hard paraffin, soft paraffin, and liquid paraffin (vaseline oil). Call *ung. glyco. plumbi subacet. ung. plumbi subacet.* simply, so that it may get printed by the side of the other lead ointments. Ether is latinised with a diphthong, but ethyl is not; better drop the cumbersome *æ* (or if not, then use it for both). When buying ether (92 per cent.) it is usual to say "ether pure," to distinguish from methylated ether. It would be well, therefore, for the B.P. to follow suit by calling ether—ether *purus* and the present ether *purus*—ether *absolutus*. I think the compilers of the B.P. are a little too timid in adopting systematic names. *Arsenii* oxidum is a term not much used for the familiar "arsenic," but neither is acid. *arseniosum*, and as the former is more correct it should have the preference officially. It is also high time for educated men to drop the term "cotton wool." How can cotton be wool? We can rise to colchicum corn, but not to orange pericarp. Essential oils should be uniformly termed *ottos* (*otto limonis*, etc.). The present description of paraff. *molle* as white or yellow is most ambiguous. Two articles should be inserted, *p.m. album* and *p.m. flavum* (exactly as with *cera alb.* and *flav.*), and the white should be used for all pale ointments, the yellow only where there is a dark constituent.

It would be a great gain if formulæ were more frequently constructed with easily divisible quantities, e.g., *ung. acid. carbol.* 1 in 20 instead of 19; *ung. acid. boric.* 1 in 8 instead of 7; *ung. acid. salicylic.* 1 in 30, not 28. Many other instances might be mentioned. Recipes printed as is that for *ung. cantharidis* are somewhat misleading; the quantity of each ingredient ought to be carried out separately. One is apt to look hurriedly and think the ointment is 1 in 7 instead of 8. Heat is not required in making either of the tinctures of quinine. Forms for vapor benzoini and *ung. hyd. oxid. flav.* might well be included. Under proof spirit add "product seven pints, sixteen ounces." Everyone, of course, is looking for a bold adoption of the metric system, but may I express a hope that no attempt will be made to depart from the principle of "liquida by measure." The difficulty is this:—Minims up to fifteen can only be expressed by using fractions of a millilitre or cubic centimetre, or by an immense number of cubic millimetres. Hence the tendency to express by weight. Fractions—especially in prescriptions—are bad because the ciphers and points are so easily misplaced. I suggest the division of the millilitre into ten "parvilitres" (or "parvils")—this parvil to take the place of the minim throughout in doses and formulæ. Measurement by the sub-divisions of the litre will be more convenient for pharmacists than by the cubic centimetre, as the latter runs into such unwieldy numbers.

DEVONIENSIS.

WEIGHTS AND MEASURES.

Sir,—I have just read with pleasure Mr. D. R. Dott's article in the *Pharmaceutical Journal* of October 20, on "Weights and Measures," and I entirely agree with him. I have had twenty-six years' experience of both methods, and I have on many occasions seen the point put in the wrong place (in prescriptions) in the metric system, as suggested by Mr. Dott as a likely error.

San Remo.

FRANK R. SQUIRE.

Answers to Correspondents, etc.

J. Horn.—The title "Graduate in Pharmacy" (Ph.G.) is conferred by several colleges of pharmacy in the United States, after the completion of a definite course of instruction. Sometimes the phrase is used informally to indicate one who has passed the Minor or legal qualifying examination in this country.

Thymus.—Apparently a water-soluble aniline dye.

"Dental."—We are not aware of any such change in the law. As you surmise, the practice is not legally prohibited, but only the unlawful assumption of title. At the same time, unregistered persons cannot recover fees for operations, attendance, or advice.

Obituary.

Notice has been received of the death of the following:—

On August 30, 1894, at Goodwood, Australia, *Désiré Monohéry Renaud*, Pharmaceutical Chemist, formerly of Port Louis, Mauritius. Mr. Renaud was a life member of the Society, with which he had been connected since 1860.

On October 13, *Joseph Philip*, Chemist and Druggist, Wadebridge. (Aged 59.)

On October 18, *Austin S. Grieves*, Pharmaceutical Chemist, Birmingham. (Aged 59.)

On October 19, *Arthur Reekie*, Chemist and Druggist, Edinburgh. (Aged 49.)

On October 20, *Patrick Dalgarno*, Chemist and Druggist, Southampton. (Aged 61.)

On October 24, *Francis W. Carnaby*, Chemist and Druggist, Blyth. (Aged 37.)

Diary of the Week.

SATURDAY, OCTOBER 27.

Pharmaceutical Football Club v. *Cowley Athletic*, at New Barnet, at 3.15 p.m.

THURSDAY, NOVEMBER 1.

Chemical Society, at 8 p.m.

"The Electromotive Force of Alloys in a Voltaic Cell," by A. P. Laurie.

"The Action of Nitric Oxide on Sodium Ethylate," by G. W. Macdonald and D. Orme Masson.

"On Ethylic Butane Tetra-Carboxylate," by D. Less. *Linnean Society of London*, at 8 p.m.

"Contributions to the knowledge of Monocotyledonous Saprophytes," by Percy Groom.

"On an Error in the Descriptions of the Effect of Centrifugal Force upon Growth," by Rev. G. Henslow.

"On Mediterranean and New Zealand Retepora, and a Fensetrate Bryozoa," by A. W. Waters.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

"The Land of Green Ginger," by Charles Sharpe. *Chemists' Assistants' Association*, at 8.30 p.m.

"Recent Advances in Photography," by E. W. Hill. *Glasgow Pharmaceutical Association*.

Presidential Address, by W. L. Currie.

Adjourned Discussion on J. A. Russell's Motion.

FRIDAY, NOVEMBER 2.

Quekett Microscopical Club, at 7 p.m.

Exhibition of Objects.

Notices to Contributors.

* * Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., before noon on Wednesday, if publication be desired in the next issue of the Journal; though this cannot always be guaranteed.

Matter intended for publication must be written in ink on one side of the paper only, and be authenticated by the name and address of the writer; it is necessary for publication, but as a guarantee of good faith.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Clegg, Cracknell, Gibson, Hudson, Kemp, Kidd, Leitch, McLoughlin, Merson, Morley, Mumbray, Rawling, Robinson Smith, Squire, Summer.

"THE MONTH."

Photographic Developers. G. A. Le Roy observes that the reducing power of alkaline peroxides, or of hydrogen peroxide, in aqueous solution, is capable of exerting itself upon the bromide or chloride of silver in gelatin emulsions employed on dry photographic plates, after those salts have been exposed to the action of light. The intensity of the reduction effected is proportional to the extent of the luminous action upon the exposed surface. Such solutions, therefore, are capable of revealing latent photographic images obtained by means of dry plates. At the same time the alkaline peroxides are inferior in that respect to the developing agents usually employed in photography, and require the time of exposure to be prolonged. Moreover, the developed image, formed by metallic silver and its oxides, loses its intensity to some extent in the hyposulphite or sulphocyanide solutions used as fixing baths (*Comp. rend.*, cxix., 557).

Formal as an Antiseptic. A. Trillat, having demonstrated that the proximity of a cloth moistened with a weak solution of formic aldehyde serves to arrest the putrefaction of meat, has based a system of disinfection upon this property, and now publishes the results of a later series of experiments on the disinfection of rooms. The apparatus employed is a kind of lamp capable of transforming daily about five kilogrammes of methylic alcohol, by incomplete combustion, into the vapour of formal, the yield of the latter being about 25 per cent. of the alcohol consumed. The lamp, of which an illustration is given, consists of a copper cylinder, 20 Cm. high by 16 Cm. wide, which rests upon a spirit reservoir of two litres capacity, and is covered at the top by a lid. At each extremity of the cylinder there is a row of draught-holes covered by a similarly perforated movable ring, so that the entry and exit of air can be easily regulated as in a Bunsen burner. The lamp has a large round wick, about three or four centimetres above which is fixed a piece of platinum gauze. In use, the lamp is lighted, and when the platinum gauze in the cylinder has been warmed for a few seconds the draught-holes are closed. It is not long before the flame is extinguished and if at the precise moment the draught-holes are opened wide the platinum gauze becomes incandescent. With a little manœuvring the supply of air may be so regulated that a dull red incandescence is maintained, and the lamp then continues to act, burning without a flame. The vaporised methylic alcohol is instantaneously oxidised to formic aldehyde on coming in contact with the platinum, and the aldehyde vapour escapes through the upper draught-holes. It was found that the action of the vapour was as effectual in the upper as in the lower parts of rooms, and that in a room of 20 M² all germs were killed by it in eight hours, the weight of methylic alcohol burned being 0.200 Gm. In the course of further experiments it was proved that the presence of water mitigated the antiseptic action of the formal in a degree that was proportional to the humidity of the atmosphere. Surgical instruments and metallic articles, as well

as cloth, etc., were not deteriorated by the action of the formal vapours, though certain colours were affected, materials dyed with rosaniline derivatives, for example, becoming somewhat violet in tint. The odour of the formal, it is noted, may be removed from rooms by strong currents of air or by exposing open vessels containing ammonia (*Nouv. Rem.*, x., 464).

Sodium and Potassium Phosphides. A. Joannis has obtained a compound to which he ascribes the formula PH_2K by passing phosphoretted hydrogen into an ammoniacal solution of potassium ammonium. This potassium phosphide occurs in fine white needles, and is analogous to potassium amide, NH_2K . In a similar manner he was able to prepare sodium phosphide, PH_2Na , from sodammonium, as a white solid. The action of heat decomposes the compounds, as follows:— $3\text{PH}_2\text{K} = 2\text{PH}_3 + \text{PK}_3$. Water also decomposes them, with liberation of phosphoretted hydrogen, and when ammoniacal solutions containing them are treated with nitrous oxide, a volume of nitrogen is liberated equal in volume to the nitrous oxide employed (*Comp. rend.*, cxix., 557).

Mercury Sulphates. R. Varet gives some interesting illustrations of the interdependence of chemical and physical factors. Thus, he shows that when water acts upon sulphate of mercury more heat is produced than with any other reaction of the latter, and that this exothermic reaction explains why the salt is decomposed into free acid and a basic salt, since in the case of alkaline or metallic salts which are not decomposed by water the action is endothermic. Again, whilst sulphuric acid displaces the hydrocyanic acid in potassium cyanide, without precipitation and with the disengagement of heat which corresponds to the thermal preponderance of the first acid relatively to the base, in the case of mercury it is the hydrocyanic acid which completely displaces the sulphuric acid with a similar disengagement of heat. This reversal of the ordinary conditions between the two acids is precisely similar to what occurs with hydrocyanic and hydrochloric acids, and is in that case explained in the same way by the thermal preponderance of the former acid. Sulphuric acid is also more or less completely displaced from sulphate of mercury by hydrochloric acid, for the same reason (*Comp. rend.*, cxix., 684).

Antimony Sulphide. H. Baubigny discusses the question whether the compound formed by the action of an alkaline hyposulphite upon antimony trichloride is a sulphide or, as generally supposed, an oxy-sulphide, and gives the results of experiments performed with a view to solving the problem. He concludes that the colouring matter of the so-called vermilion of antimony, formed by the action of sodium hyposulphite on tartar emetic in the presence of tartaric acid, in so far as it is a definite chemical compound, is the ordinary sulphide, Sb_2S_3 . If it possesses a special tint that, it is asserted, is due to the conditions under which the compound has been prepared. As to the compound prepared from antimony trichloride in the absence of tartaric acid, if it contains oxygen it is only as an admixture, in the form of oxychloride (*Comp. rend.*, cxix., 687).

Novel Hydrocarbon in Fir Tar.

A. Renard describes a novel hydrocarbon occurring among the products of distillation of fir tar, which is probably a member of the aromatic series. When purified it is a colourless liquid, boiling at 254° – 257° . Its density at 0°C . equals 0.9419, its refractive index is 1.507, and it is without action on polarised light. Its analysis and vapour density indicate its formula as $\text{C}_{14}\text{H}_{22}$. Exposed to air it becomes brown in colour, but hydrochloric acid does not affect it. With bromine it forms colourless crystals of a tetrabromide derivative, $\text{C}_{14}\text{H}_{18}\text{Br}_4$, and an unstable dibromide, $\text{C}_{14}\text{H}_{20}\text{Br}_2$, may also be prepared. A nitro-derivative, $\text{C}_{14}\text{H}_{21}\text{NO}_2$, is formed by the action of fuming nitric acid upon an acetic solution of the hydrocarbon, and a sulphonic derivative by the action of sulphuric acid. The latter when separated, distilled, and otherwise purified, yields about 15 to 20 per cent. of a saturated hydrocarbon that boils at about 250° – 253° , corresponds to the formula $\text{C}_{14}\text{H}_{26}$, and is unaffected by the strongest acids. The sulphonic acid remaining in solution may be separated by precipitating it as an ammoniacal salt, which is very soluble in water. The acid also forms an insoluble barium salt, $(\text{C}_{14}\text{H}_{21}\text{SO}_4)_2\text{Ba}$. The last reaction noted of the hydrocarbon, $\text{C}_{14}\text{H}_{22}$, is the very marked blue coloration produced on treating it with a mixture of sulphuric acid and alcohol. This, according to Maquenne, is characteristic of the aromatic hydrides. The partial transformation of the new compound, when treated with sulphuric acid, into a saturated hydrocarbon may be compared with the transformation of heptene, C_7H_{14} , into toluene hexahydride, and it may possibly be correct to regard it as bi-heptynyl, $\text{C}_7\text{H}_{11}-\text{C}_7\text{H}_{11}$, or bi-tolyl octo-hydride, $(\text{H}_7-\text{O}_2\text{H}_7)-(\text{C}_7\text{H}_7-\text{H}_7)$. This formula also accords with the transformation of the compound into a saturated hydrocarbon or bi-tolyl dodecahydride $(\text{H}_7-\text{C}_7\text{H}_7)-(\text{C}_7\text{H}_7-\text{H}_7)$, by fixation of four atoms of hydrogen (*Comp. rend.*, cix., 652).

Bismuth Nitrosalicylates.

H. Causse shows that, even in dilute solutions, nitric acid in combination with bismuth oxide converts salicylic acid into β -nitrosalicylic acid which is capable of forming a series of salts the appearance of which varies with their composition. Thus, the neutral β -nitrosalicylate of bismuth $-(\text{C}_6\text{H}_4\text{NO}_2\text{OH}\cdot\text{CO}_2)_2\text{Bi} + 2\text{H}_2\text{O}$ —forms colourless needles; the basic salt $-\text{C}_6\text{H}_4\text{NO}_2\text{O}\cdot\text{CO}_2\text{BiOH} + \text{H}_2\text{O}$ —occurs as citron yellow needles; and the sub- β -nitrosalicylate of bismuth $-(\text{C}_6\text{H}_4\text{NO}_2\text{OH}\cdot\text{CO}_2)_2\text{Bi}_2\text{O}_3\text{H}_2 + \text{H}_2\text{O}$ —precipitates in needles of a reddish-orange colour. This property of the acid seems to be owing to the presence of the group NO_2 in its molecule. The red coloration of bismuth salicylate, supposed to be due to the presence of iron, is alleged to be caused by the presence of a nitrosalicylate. These statements should be of interest to dispensers (*Comp. rend.*, cix., 690).

Magnesium Voltaic Cell.

H. N. Warren suggests the substitution of magnesium for the zinc rod in the Daniel's voltaic cell, on account of its greater reducing action, and the use of cupric chloride instead of cupric sulphate in the outer vessel, because of its greater solubility in water, and the possibility of making the solu-

tion so as to offer less resistance. This solution should be rendered strongly acid by means of hydrochloric acid, and will be very slowly decomposed. The porous pot should be charged with a strong solution of ammonium chloride which dissolves the magnesium uniformly, forming a double chloride, and at the same time prevents local action. With these modifications it is said a voltaic arrangement may be constructed giving a voltage equal to a nitric acid battery or bichromate cell (*Chem. News*, lxx., 179).

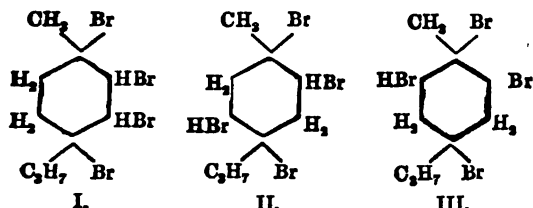
Phosphorescence at Low Temperatures.

Similar investigations to those of Professor Dewar (*ante*, p. 1) have been undertaken by Raoul Pictet, the intention being to determine the specific action of a considerable lowering of temperature upon the brilliancy of certain bodies which shine in the dark after having been exposed to sunlight. Tubes of glass filled with the powdered sulphides of calcium, barium, strontium, etc., all substances which possess the property of phosphorescence in a high degree, were exposed to the solar rays and afterwards proved to be luminous in the dark. This was done in such a way as to fix upon the memory the mean value of the progressive diminution of the emitted light, and the time also was noted during which the light was strong, less strong, and weak respectively. The tubes were next placed in bright sunlight for one minute and then suddenly introduced into a double-walled glass cylinder, the interspace of which was filled with nitrous oxide at -140°C . In about five or six minutes the temperature of the tubes was about -100° . They were then withdrawn and, when observed in a perfectly dark chamber, no luminosity whatever was perceptible. As the tubes recovered their normal temperature, however, the phosphorescence returned, without the exciting agency of either the sun's rays or diffused light. These results were proved to be general for all phosphorescent substances employed. The complete suppression of phosphorescence at very low temperatures having been thus demonstrated, attempts were next made to fix the limits of temperature at which the luminosity ceases to be visible. Tubes of phosphorescent powder were exposed to sunlight, then rapidly conveyed to the dark chamber and partially immersed in alcohol cooled to -75° . The phosphorescence disappeared completely from the portion of the powder contained in the part of the tube immersed, when its temperature was reduced to -60° or -70° , but after immersion for more than half an hour the light returned spontaneously as the effects of cooling wore off. The phenomena were alike with all the phosphorescent substances examined. The blue, green, or orange light emitted by different metallic sulphides tended in all cases to change to an earthy yellow before being extinguished. It was proved by repeated experiments that condensed moisture on the outside of the tubes did not in any way influence the extinction of the phosphorescent light, or affect any of the observed results. It appears certain, to Pictet, that the production of phosphorescent light requires a certain movement of the constituent molecules of bodies. When these are frozen and the calorific oscillatory movements are checked, the luminous waves are not produced and the phosphorescence disappears accordingly (*Comp. rend.*, cix., 527).

Constitution of Limonene. Wallach has determined the constitution of limonene from the following considerations:—Limonene reacts with bromine, forming limonene tetrabromide, which is decomposed by sodium methylate thus:—

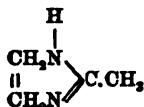


The product can be made to yield the methyl ether of carvol by treatment with silver acetate and acetic acid, and by treatment with hydrobromic acid dipentene tetrabromide results. Since carvol and dipentene can be obtained from limonene tetrabromide, that compound must have one of the three following formulae:—



The third is considered an unlikely configuration from analogy. By acting on I. with sodium methylate, no product could result which would yield carvol or dipentene derivatives on treatment with silver acetate or hydrobromic acid. But II. would yield the ether, and is capable of forming carvol ether and dipentene tetrabromide. Now terpineol yields a tribromide of known composition, and the three bromine atoms in its formula are in the same position as those presupposed for limonene tetrabromide, whilst the compound yields carvol ether by proper treatment, identical with carvol ether obtained from limonene. Thus the formulae for limonene tetrabromide and limonene are confirmed (*Annalen*, 281, p. 127).

Lysidin. At the Naturforscherversammlung in Vienna, Ladenburg described under this name a basic compound obtained in the state of hydrochloride by heating ethylene diamine hydrochloride with sodium acetate. The composition of the free base is $C_4H_8N_2$, and its constitution is represented by the formula—



The water solution of this base it described as having a remarkable power of dissolving uric acid, and the application of lysidin in the treatment of diseases arising from secretion of uric acid is being investigated. The substance is described by Grawitz (*Deutsche med. Wochens.*, 1894, p. 786) as crystalline, of a light red colour, readily soluble in water, and having a peculiar taste. It is given in doses of from 15 to 80 grains daily, dissolved in carbonic acid water. The manufacture of lysidin is being carried out at the Höchst chemical works.

Localisation of Alkaloids in Plants. In a paper in the *Bulletin of the Belgian Microscopical Society* (1894), M. Clautriau describes the mode of distribution of the alkaloids in a variety of plants, which he arranges under five

types, viz.:—(1) In a layer of cells lying between the endosperm and the true testa (*Atropa belladonna*, *Datura stramonium*, *Hyoscyamus niger*); (2) in two layers, especially in the outer one, between the endosperm and the pericarp; also, to a smaller extent, in the epiderm, and in the cells which accompany the vascular bundles (*Conium maculatum*); (3) in the endosperm, especially in its peripheral cells (*Aconitum napellus*, *Delphinium staphysagria*); (4) in all the cells of the endosperm, and to a smaller extent in those of the embryo (*Strychnos nux-vomica*); (5) apparently in the cotyledons and plumules (*Lupinus albus*). The alkaloids take no active part in germination, but are formed in the seedling by decomposition of the albuminoids. In *Papaver somniferum* the amount of alkaloids decreases as the seeds ripen, and this is accompanied by an elimination of nitrogen. Their chief function here appears to be to protect the plant from consumption by animals.

Formation and Function of Tannins. In a paper in the *Programme der Realsschule vor der Holstenthore in Hamburg*, Herr G. Mielke traces the formation of tannins in plants through phenols, phenol-alcohols, and aldehydes; they occur, in chemical combination with sugar, as glucosides, and play an important part in vegetable economy, since they are the indispensable materials for the production of lignifying substances. They are never formed out of albuminoids, and are not nutritive substances; they can take part in metabolism only when they revert to their previous stages by absorption of water. Resins and essential oils are probably the final results of the metamorphosis of tannins.

Action of Light on Diastase. In a paper presented to the British Association and recently abstracted in the 'Annals of Botany,' Professor J. B. Green states that the results of the experiments that have so far been conducted show that light, whether solar or electric, exercises a destructive effect upon diastase, which continues after the exposure to light is discontinued, the exposed solution gradually becoming weaker until it possesses no diastatic power. This deleterious influence is confined to the rays of the violet end of the spectrum, the others being slightly favourable rather than destructive. Part of the solution so found to be affected by light-rays was kept in darkness and maintained its diastatic power unimpaired for more than a month, by which time the exposed portion of the solution, which had also been kept in darkness after an exposure of from two to eleven days, possessed no power to act upon starch. The experiments were performed on an extract of malt prepared by infusing ground malt with water or salt solution, and the results would seem to indicate the desirability of carefully protecting malt extracts from the action of light. A comparison of the diastatic power of fresh malt extract with that of similar material exposed in the pharmacy for varying periods suggests itself as an investigation of direct pharmaceutical and medical interest. At the same time it yet remains to be proved that the diastase is the chief or only active agent in malt extract. The colouring matter of the barley-husk has been proved to act as a screen which preserves the diastase from the destructive effect of light, whether it is dissolved

in the extract made from malted barley or used separately as a screen placed before the cells in which exposure is made.

Wheat and Rye Starch.

E. Guenez points out that these starches possess very similar characters, and it is difficult at times to say decidedly that a given sample consists of one rather than the other. To distinguish the two kinds he recommends that a little of the material be mounted in water for examination with the microscope. The wheat starch will then be seen to contain comparatively few split grains, which possess an isolated fracture situated near the edge or proceeding from the centre to the circumference. In the case of rye starch the split grains are more numerous and possess a star-shaped fracture with three or four branches, apparently originating in the centre of the grain and rarely reaching the edge. Some grains may also be found which have only a linear crack, but this will be larger in the centre of the grain than towards the edges, just the reverse of what occurs in wheat (*Bull. de pharm. de Bordeaux*, xxxiv., 289).

New Remedies.

The *Pharmaceutische Centralhalle* mentions several preparations of a secret nature which have recently been introduced under the following names:—Chroato, for the treatment of skin diseases; Collasin, a kind of varnish, preferable to collodion, for application to the skin; Brassicon, a remedy for headache, apparently consisting of camphor, peppermint oil, ether, oil of mustard, and alcohol. As a remedy for sea-sickness, Anti dyspepticum is recommended, and somewhat vaguely described as a mixture of a double tartrate with sodium bicarbonate, magnesia, quinine, and sal ammoniac. Boral is a compound of aluminum borate and tartrate; Cutal, an aluminum borotannate, containing 10.71 per cent. boric acid, and 76 per cent. tannin.

Leaves of Scopolia Carniolica.

The question whether these leaves contain scopolamine has been investigated by Mr. J. B. Nagelvoort, who has grown the plant for the purpose of identifying its alkaloid with commercial hyoscyne. The results obtained were totally negative, but it is suggested that this isolated instance is scarcely sufficient to settle the question, especially since it is known that cultivated plants are frequently poorer in alkaloid than those growing wild (*American Journal of Pharmacy*, xxiv., 431).

Purification of Water by Green Plants.

The prevalent idea that green plants (flowering plants and algae) growing in running water add to its impurity and unfitness for drinking purposes, has long been shown to be erroneous. As long as they are in a growing condition they can only tend to purify the water by giving out oxygen into it. In a paper in the *Archives für Hygien* (1894, No. 2), Dr. T. Bokorny maintains that aquatic bacteria also have a share in the purification of the water as long as it contains a considerable quantity of organic matter. A series of experiments carried on by the author showed that algae are capable of decomposing fatty acids such as butyric and valeric, as also glucose, leucine, and tyrosine.

MANUFACTURE OF ESSENTIAL OILS.

The essential oil industry has derived considerable advantages from the progress in the chemical investigation of essential oils which has taken place during the last few years. The term which used often to be applied to the supposed workmanlike manufacture of an essential oil, that it had been turned out according to the rules of the art ("lege artis") is now no longer suitable.

A mode of manufacture based upon intelligent principles has replaced rule-of-thumb work; craftsmanship has been ousted by science, which, in teaching us the physical and chemical properties of an oil, indicates at the same time ways and means of improving its manufacture. Nowadays each raw material requires its own method of distillation, every crude oil its own special mode of rectification. The processes of preparing similar oils are sometimes altogether different in principle, while in other cases slight deviations in method are sufficient to bring about important improvements in the manufacture.

The fact that freshly distilled oils have a disagreeable subsidiary odour, the so-called "still-smell," was formerly looked upon as quite a matter of course, but it is now known to indicate either want of knowledge in the process of distillation or gross carelessness. The fresher the oil, the purer should be its odour and taste. Freshly rectified oil of caraway should smell just as aromatic and agreeable as the freshly crushed seed. If, as a result of defective distillation, an oil has once acquired the well-known mouldy sharp odour, no amount of exposure of the oil to the air will remove this entirely; but, on the other hand, the oil, if kept in this condition, all the more rapidly falls a victim to the fate of almost all essential oils, viz., resinification or other decomposition, without having ever been really pure in odour or taste.—*Schimmel's Bericht*.

DEODORISING RECOVERED ALCOHOL.

BY EDWARD A. KADEL.

Here is a method that, with slight modifications, gives splendid results in my hands. I have not as yet found an alcohol so vile that I failed to purify it so as to render it fit for employment in general manufacturing.

The alcohol is first treated with caustic soda; for alcohol recovered from drugs like arnica, buchu, cubeba, etc., one ounce to each gallon is employed. After standing for two to five days it is distilled in a water-bath or steam jacket kettle. The alcohol first passing over must be returned to the still. This is continued until the odour is either changed or lost. Usually this distillation leaves an empyreumatic and sometimes a soapy odour to the alcohol. It is then redistilled with potassium permanganate; the quantity to be used can be determined by experience alone, alcohol recovered from the same drug at different processes requiring different proportions; usually one to four drachms to a gallon is employed. Thus treated it is generally clean enough for re-employment for manufacturing purposes, seldom pre-

ducing any coloration with hydric sulphate. If further purifying is desired again distil with the permanganate and filter through animal charcoal, but unless the charcoal is freshly prepared this is useless. If I have not fresh charcoal, I add a small quantity of distilled water and distil again after the second treatment with the permanganate.

From the standpoint of economy this process certainly is unobjectionable. I employ a five-gallon still of my own construction, a fair average of three gallons an hour by water-bath being its working capacity. Time, gas, and material, I find, are fully compensated for, and in laboratories equipped with steam the cost of purifying is reduced to a minimum. The process requires no attention after it is once under way; I seldom go near the still after complete automatic action has been secured.—*Indiana Pharmacist and Western Druggist.*

ABSORPTION-SPECTRUM OF CHLOROPHYLL.

In two papers in the *Acta Horti Petropolitani* (1893 and 1894), M. N. Monteverde states that the absorption-spectrum of living leaves consists of seven bands and a terminal absorption. The degree of intensity of the former is as follows:—I.a, VI., V., I.b, II., III., IV. The spectrum of the alcoholic extract differs only in the absence of I.b, and in a slight shifting of all the bands. Instead of first boiling in water, as most other observers have done, he extracts the chlorophyll at once with cold 95 per cent. or absolute alcohol. The alcoholic extract always contains two green and two yellow pigments. The two latter are separated by precipitating by baryta and extracting the precipitate by alcohol. If this extract is then agitated with petroleum ether, the carotin is dissolved in the ether, the xanthophyll in the alcohol. The two green pigments are termed by the author amorphous and crystalline chlorophyll. Their relative amount differs greatly in different leaves. Amorphous chlorophyll is characterised by the complete absence of band V. from its spectrum. It is more soluble in benzine, petroleum ether, and carbon bi-sulphide than in alcohol. Crystalline chlorophyll may be obtained from certain leaves (e.g., *Dianthus barbatus*, *Dahlia variabilis*) simply by evaporating the alcoholic extract and purifying the crystals by water and benzine. They are completely insoluble in petroleum ether, carbon bisulphide, and ordinary benzine; soluble in alcohol, ether, chloroform, and pure benzine. It is probable that living leaves contain this kind only of chlorophyll. The alcoholic extract of *Oscillatoria* filaments contains carotin, phycozanthin, and both kinds of chlorophyll. Etiolated leaves contain, besides xanthophyll and carotin, a pigment to which the author gives the name "protochlorophyll." It displays a distinct red fluorescence, and exhibits a line in its absorption-spectrum corresponding to band III. of chlorophyll, and a second characteristic band at some distance from band II. of chlorophyll. Band I. is entirely wanting. The spectrum attributed by Pringsheim and Tschirch to etiolin is probably a combination of the spectra of a modified chlorophyll, of protochlorophyll, of carotin, and of xanthophyll.

THE PROPOSED IMPERIAL PHARMACOPEIA.

By the courtesy of the Registrar of the Pharmacy Board of Victoria, we are enabled to present to our readers the recommendations of the Victorian Branch of the British Medical Association, the Pharmacy Board of Victoria, and the Pharmaceutical Society of Australasia, concerning the forthcoming new Pharmacopœia. A summary of these recommendations was given in the Journal for September 29 (see p 256).

RECOMMENDATIONS RE NEW PHARMACOPEIA.

The following is the Report of the Committee, as finally revised, and approved at a meeting, on August 15, 1894:—

In view of the proposed revision of the British Pharmacopœia, and upon the receipt of a letter from the Hon. the Premier, inviting their co-operation, the Victorian Branch of the British Medical Association appointed a Sub-Committee to deal with the matter of recommendations *re* the new Pharmacopœia. This Sub-Committee associated with it Baron Sir F. von Mueller, Government Botanist; Messrs. J. Bosisto, F. Davenport, H. W. Potts, Pharmaceutical Chemists; and with Messrs. C. R. Blackett and G. Swift, representing the Pharmacy Board of Victoria; and R. P. Francis, representing the Pharmaceutical Society of Australasia. The following Report is the result of their conjoint labours, and is to be taken as representing their combined recommendations.

Upon the following points there was unanimous agreement:—

1. That in the case of the drugs mentioned in Appendix A, which there is the authority of Baron von Mueller for asserting can be grown in Victoria equally as well as in the present recognised official parts, the present restrictions as to growth and preparation be removed so far as Victoria is concerned; and that *Duboisia* be introduced as suggested by Baron von Mueller.
2. That in lieu of the present unsatisfactory official formulæ for eucalyptus and preparations, the formulæ mentioned in Appendix B, which have been drawn up by Mr. Bosisto, C.M.G., be substituted.
3. That the metric system of weights and measures be adopted.
4. That failing the adoption of the metric system, the strength of the liquors of the alkaloids revert to gr. j in 3 ij.
5. That the drugs and preparations mentioned in Appendix C, being unused in practice and unnecessary in therapeutics, be omitted from the new Pharmacopœia.
6. That attention be drawn to the unsatisfactoriness of wax and paraffinum durum as bases for ointments; that all the properties required in such ointments can be obtained from suitable combinations of adeps lane and paraffinum molle; and that cacao butter be recognised as the sole basis for all suppositories.
7. That in regard to tests, such as those used in chloroform, chloral, carbolic acid, creasote, etc., there be introduced such improvements as are now generally accepted; and that there be mentioned with the test the specific impurity which it is destined to show the presence or absence of.
8. That the standardisation of drugs and prepara-

tions, already official in the case of opium, nux vomica, and cinchona, be extended where practicable to other powerful drugs, such as aconite, belladonna, digitals, ergot, hyoscyamus, ipecacuanha, etc.

9. That the drugs and preparations mentioned in Appendix D be included in the new Pharmacopœia.

10. That the list of tabellæ be increased by the addition of those for hypodermic use mentioned in Appendix E; that the trochisci of the latest edition of the London Throat Hospital be made official; and that cigarettes be introduced of cubebs, arsenic, cannabis indica, and stramonium.

11. That, like the decoctions, all the infusions be made up to a definite quantity.

12. That, so far as practicable, by a revision of flavouring agents, by the extension of capsules, tabellæ, trochisci, and the like, and by the introduction of suitable compressed tablets, cigarettes, and the like, there be a sustained attempt made after such improvements in flavouring and dispensing as tend to the more palatable and elegant administering of drugs generally.

Upon the question of dosage, the pharmacists preferred to leave the matter in medical hands, although they agreed generally with the following recommendations of the medical Sub-Committee.

13. That in the cases mentioned in Appendix F the minimum official dose should be lessened.

14. That in the cases mentioned in Appendix G the maximum official dose should be increased.

15. That in the cases mentioned in Appendix H the inconsistencies in dosage should be rectified.

16. That the dosage be given in the cases mentioned in Appendix I.

17. That it be required that excessive dosage be not dispensed by the pharmacist, unless and until it has been initialled, or otherwise drawn attention to by the prescriber.

Signed,

J. W. SPRINGTHORPE, M.A., M.D. Melb., M.R.C.P. Lond., Lecturer on Therapeutics in the University of Melbourne.

F. H. COLE, M.B. Melb., Lecturer on Pharmacy in the College of Pharmacy, Melbourne.

P. W. FARMER, M.B. Melb., Lecturer on Chemistry in the College of Pharmacy, Melbourne.

C. R. BLACKETT, F.C.S., President of the Pharmacy Board of Victoria; Government Analyst.

R. P. FRANCIS, Hon. Treasurer, Pharmaceutical Society of Australasia.

W. L. MULLEN, M.A., M.D., LL.B. Melb. Hon. Sec., Victorian Branch of the British Medical Association, and of Committee.

APPENDIX A.

Medicinal plants in the British Pharmacopœia which grow satisfactorily in the Colony of Victoria:—

Aconitum napellus, Linné. *Onium maculatum*, Linné.
Anacyclus pyrethrum, De Candolle. *Colchicum autumnale*, Linné.

Anthemis nobilis, Linné. *Convolvulus scammonia*, Linné.
Atropa belladonna, Linné. *Coriandrum sativum*, Linné.
Berberis vulgaris, Linné. *Cucumis colocynthis*, Linné.
Capsicum fastigiatum, Blume. *Cytisus scoparius*, Link.
Carum carui, Linné. *Delphinium staphisagria*, Linné.
Cinnamomum camphora, Nees. *Digitalis purpurea*, Linné.
Cochlearia armoracia, Linné. *Ecbalium elaterium*, Richard.
Feniculum officinale, Allioni. *Pimpinella anisum*, Linné.
Fraxinus ornus, Linné. *Pistacia lentiscus*, Linné.
Gelsemium nitidum, Richard. *Podophyllum peltatum*, Linné.
Gentiana lutea, Linné. *Polygala senega*, Linné.
Glycyrrhiza glabra, Linné. *Prunus laurocerasus*, Linné.
Hyoscyamus niger, Linné. *Rhamnus frangula*, Linné.
Juniperus communis, Linné. *Rheum palmatum*, Linné.
Juniperus sabina, Linné. *Ricinus communis*, Linné.
Lactuca virosa, Linné. *Rosmarinus officinalis*, Linné.
Lavandula vera, De Candolle. *Ruta graveolens*, Linné.
Lobelia inflata, Linné. *Sambucus nigra*, Linné.
Mentha piperita, Linné. *Thymus vulgaris*, Linné.
Mentha viridis, Linné. *Urginea scilla*, Steinhell.
Papaver somniferum, Linné. *Valeriana officinalis*, Linné.
Veratrum viride, Solander.

FERDINAND VON MUELLER.

Mr. Bosisto also writes as follows:—

Opium (*Papaver somniferum*).

This plant grows luxuriantly in Victoria, and yields morphine fully equal to that grown in Asia Minor.

After the words "Asia Minor" in the B.P., we would recommend to add "or Victoria, Australia." We have no evidence of its growth in the other Australian Colonies.

Essential Oils.

The climate of Australia is well adapted for, and produces to perfection, essential oils from umbelliferous plants, viz., anise, caraway, coriander, dill; also chamomile, lavender, lemon, peppermint, rosemary, and rue. We therefore recommend that after the words "oil distilled in Britain," the following words be added, "or in Australia."

Regarding *Duboisia*, Baron von Mueller advises as follows:—

Duboisia myoporoides, R. Brown.

Dubosine: Prepared from leaves with their branchlets in the manner of nicotine. Yellowish oil-like liquid, volatile, lighter than water, of strong narcotic odour, of pronounced alkaline reaction, completely neutralised by acids, dissolves in all proportions in water, alcohol, or ether precipitates ferrous oxide from sulphate of iron, dissolves without colouring in concentrated acids. Its hydrochloride, in a weak aqueous

solution, is precipitated by iodide of potassium, the iodides of potassio-mercury and of potassio-bismuth, and by tannic acid, not by many other alkaloid reagents tried. Duboisine is in many respects allied to nicotine, but that alkaloid is distinguished by specific gravity, its less powerful odour, by its hydrochloride in a diluted aqueous solution being precipitated by phosphomolybdate of sodium, picric acid, and chloride of platinum (F. von Mueller and L. Rummel, in Wittstein's "Organic Constituents of Plants," p. 331—F. v. Mueller's translation, with additions, 1878). The sulphate of duboisine is lamellar and yellow.

Dose, 1-120th—1-30th of a grain internally. In ophthalmic applications, 4 grains to an ounce, when only one or few drops are required; otherwise more diluted.

Tincture of *Duboisia myoporoides*.

Of the cautiously dried herb, two ounces and a half to a pint of proof alcohol, therefore, of the strength of tinct. aconiti, conii, digitalis, hyoscyami, lobeliae, stramonii, of the B.P. (unless the lesser concentration of tinctura belladonnae, dried leaves one ounce, to a pint of proof spirit of wine, be preferred).

Dose—1 to 40 minims.

Unguentum duboisinae.

One part of duboisine to 500 parts of paraffinum molle. It is not practicable to prepare an extract of *Duboisia*, as the active principle, the alkaloid, is volatile.

Duboisia hopwoodi, F. v. M.

Pitarine (C₈ H₈ N). Alkaloid closely allied to duboisine, prepared in similar manner. (The mode of preparation and elucidation of characteristics have been described by Professor Liveridge.) The alkaloid is still more powerful than duboisine.

Duboisia leichardti, F. v. M.

This plant is nearer allied to *D. hopwoodi* than to *D. myoporoides*. It seems the most powerful of all three, as last year ascertained at our Alfred Hospital.

FERDINAND VON MUELLER.

APPENDIX B.

Oleum Eucalypti.

The oil distilled by aid of steam from the fresh foliage of *Eucalyptus globulus* Labill. and the *Mallee eucalypti*, comprising *Eucalyptus uncinata* Tarz., *Eucalyptus oleosa* and *E. gracilis* F. v. M., *Eucalyptus incrassata* Labill.

Characters and Tests:—It has an aromatic odour, which varies in the different species, and a spicy and pungent flavour; pale straw colour. It is neutral to litmus paper. Specific gravity not below 0.910. Rotates polarised light to the right. Should not give the phellandrene re-action.

Tinctura Eucalypti, B.P.C.

Eucalyptol (Cineol), C₁₀H₁₈O.

Obtained in different proportions from various species of *Eucalyptus*.

Characters and Tests:—Colourless. It is liquid at ordinary temperatures, but forms crystals at —12° C. to —22° C., re-melting at —1° C. Specific gravity not below 0.920.

Dose—Two to three minims on loaf sugar or in milk.

Inhalation, one drachm to the pint of water.

Gummi Eucalypti rostratae (*Eucalyptus kino*).

The natural indurated exudation obtained from the true red gum tree of Victoria. The species *E. rostrata* is met with throughout the greater part of Australia in moist valleys and river flats. The ruby-coloured exudation from the wood, termed red gum, is entirely soluble in cold water or proof spirit. It is employed throughout Australia as a delicate mucilaginous astringent of considerable power.

Incompatibles—The alkalies and the metallic salts.

Dose—4 to 6 grains.

Tinctura Eucalypti rostratae.

Rostrata red gum in coarse powder.....2½ oz.

Oil of eucalyptus.....2 dra.

Proof spirit 1 pint.

Macerate for 48 hours, with occasional agitation; strain, filter, and add sufficient proof spirit to make one pint.

Dose—60 minims.

Syrupus Eucalypti rostratae.

1. Rostrata red gum 2½ oz.

2. Water, pure, boiling 19 oz.

3. Loaf sugar 32 oz.

4. Oil of eucalyptus 1 dr.

5. Acacia mucilage..... 1 oz.

Dissolve 1 with 2, unite 4 with 5, add 3, and make syrup.

Dose—60 to 120 minims.

Suppositoria Eucalypti rostratae.

Powdered gum rostrata 5 grs.

Extract nux vomica 1 gr.

Oil of theobroma q.s. to make one suppository.

Trochisci Eucalypti rostratae.

Rostrata gum in powder..... 720 grs.

Refined sugar „ 25 oz.

Gum acacia „ 1 oz.

Mucilage of gum acacia 2 fl. oz.

Distilled water, a sufficiency.

Mix the dry ingredients, add the mucilage and water to form a proper mass. Divide into 720 lozenges, and dry in a moderate temperature.

Unguentum Eucalypti (Ointment of *Eucalyptus*).

Fresh leaves of *Eucalyptus amygdalina* ...4 parts.

Benzoeated lard 8 parts.

Melt the lard on a water bath, add the well cut up leaves, and digest for two hours; then remove the mixture and express through calico.

The Committee is indebted to Baron von Mueller for the identification and nomenclature of the different species, and to Mr. W. P. Wilkinson for a review of the tests recommended.

APPENDIX C.

Drugs and Preparations to be omitted—

Acetum. Armoracis radix.
 Cambogia. Canellæ cortex. Cerevisiæ fermentum.
 Cataplasma fermenti. Charta epispastica. Cinchonidinæ sulphas. Cinchoninæ sulphas. Confect. opii. Confect. scammonii. Confect. terebinthiæ. Cuspariæ cortex.
 Emplast. calefaciens. Empl. galbani. Empl. plumbi. Iodidi. Empl. saponis fuscum. Extract. calumbæ. Extract. papaveris. Extract. quassiæ. Extract. rhamni. frangulæ. Extract. rham. frang. liquidum.
 Extract. taraxaci liquidum.
 Farina tritici.
 Granati radicis cortex.
 Hemidesmi. radix.
 Laricis cortex.
 Manna. Mist. ferri. aromat. Mist. scammonii.
 Nectandræ cortex.
 Oleo-resina cubebæ.
 Paraffinum durum. Pareiræ radix. Pilula scammonii comp. Pulv. catechu co. Pilula cambog. co. Pil. phosph. (B.P.)
 Rbecados petala.
 Staphisagriæ semina. Sumbul radix. Supposit. acid carbol. cum sapone, Suppos. acid tannic cum sapone. Supposit. morphinæ cum sapone (all three being insoluble). Syrupus papaveris. Syrup. rosæ gallicæ.
 Tinct. croci. Tabaci folia.
 Vinum Rhei.

APPENDIX D.

Drugs and Preparations to be made official—

Chloral cum camphora. Elixir cascariæ sagrad.
 Emulsio ol. morrhue. Elixir simplex. Pix carb. prep. Liquor picis carbon. Syrup. ferri phosph. co. Syrup. hypophosph. co. Syrup. prun. virg. Tinct. carminativa. Tinct. eucalypti.

The foregoing as in the unofficial formulary of the B.P.C. 1887.

Bismuth salicylas. Boro-glyceride. Capsules of amyl nitrite, creasote, and guaiacol. Collodium iodi. Collodium stypticum. Charta potass. nitratis. Chloralamid Albolinum. (*sic*). *Convallaria majalis*. Cortex coto. Decoct. acaciæ corticis (used in Victoria instead of decoct. quercus, *vide* formula appendix K). Ethyl. chlorid. Extract. malti. Extract. malti cum. ol. morrhue. Glycerin. pepsin. acid. Guaiacol. Ichthyol. Kaolin. Liquor pepticus. Liquor pancreaticus. Liquor copaib. et cub. et buchu. Liq. santal flav. β -Naphthol. Oleum gaultheriæ. Pil. phosph. (new formula). Resorcin. Salol. Syrup. codeinæ.

APPENDIX E.

Hypodermic Tablets, more especially for country use.

Apomorphin. hydrochlor gr. $\frac{1}{16}$
 Atropin. sulph. gr. $\frac{1}{16}$
 Cocain. hydrochlor. gr. $\frac{1}{4}$

Digitalin gr. $\frac{1}{16}$
 Morphin. sulph. gr. $\frac{1}{4}$
 Morphin. sulph. gr. $\frac{1}{4}$ cum. Atropin. sulph. gr. $\frac{1}{16}$
 Picrotoxin gr. $\frac{1}{16}$
 Pilocarpin. nitrates gr. $\frac{1}{16}$
 Strychnin. sulph. gr. $\frac{1}{16}$

APPENDIX F.

Minimum Dose too large—

Aloes and extracts gr. ij.
 Strychnine gr. $\frac{1}{16}$
 Ol. phosph. m. v.
 Extr. opii. gr. $\frac{1}{4}$
 Spir. ether m. xii.
 Tint. nuc. vom. m. x.
 Morphine and salts .. gr. $\frac{1}{4}$
 Extr. nuc. vom. gr. $\frac{1}{4}$
 Spir. ammon. fetid m. xii.

APPENDIX G.

Maximum Dose too small—

Extract. filicis liq. m. xxx. Extr. ergot. liq. m. m.
 Potass. iod. gr. xx. Quin. sulph. gr. i.
 Extr. cinchon. liq. m. x. Cerii oxalas gr. ij.
 Calomel gr. v. Mag. sulph. $\frac{3}{4}$ iv.
 Butyl. chloral gr. xv. Creasote m. iij.
 Lithii carb. gr. vi. Pot. brom. gr. iii.
 Bismuth. carb. gr. xx. Tinct. chloroform. et morph. m. i.

APPENDIX H.

Inconsistencies in Dosage—

Camphor, gr. i—x, yet spirit. camph. only m. x—iii.
 Arsenic iod., gr. $\frac{1}{16}$, yet liq. Donovanii m. x—xxx.

APPENDIX I.

Dosage to be given—

Aconitine. Apomorphine hydrochlor. Atropia sulph.
 Hydrarg. ox. rubr.
 Iodum.
 Phosphorus. Physostigmine.
 Potass. cyanid.

APPENDIX K.

Acacia mollissima (Will.), the common Victorian tan wattle, and

Acacia decurrens (Will.), the Sydney tan wattle. Both contain 20, or greater, percent. of tannic acid. Decoct. acaciæ (formerly called decoct. mimosa).

Take of *Acacia* bark 1 oz., or 25 grammes; water (distilled) 20 oz., or 500 C.c. Boil for a quarter of an hour, allow to cool, strain through muslin, wash the contents of the strainer with distilled water until the filtrate measures 20 oz., or 500 C.c. The vessel in which the decoction is boiled should be of copper, glass, or glazed earthenware.

For the above identification the Committee is indebted to Baron von Mueller, and for the formula (which is the same as that in use in the Melbourne Hospital for the past 25 years) to Mr. C. R. Blackett, F.C.S., Government Analyst.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, NOVEMBER 3, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge,—1, Bloomsbury Square, London, W.C.

POOR LAW INFIRMARY ADMINISTRATION IN ITS MEDICAL AND PHARMACEUTICAL ASPECT.

THE work of the poor law infirmaries in our great cities is one that presents much of interest to the general public, and more especially, perhaps, to those who are actively engaged in the preparation and dispensing of medicines. A short review, therefore, of one of these institutions will furnish, it is hoped, some congenial reflections to our readers, and for this purpose we have selected one of the largest, newest, and therefore presumably best administered infirmaries of the metropolitan parishes, viz., Kensington.

The Kensington Infirmary is situated in a very open neighbourhood in Marles Road, and has the immense advantage of plenty of air space, while being at the same time centrally placed within the parish. It has recently been enlarged at a cost of more than £50,000, and is now a very complete establishment. The wards of the new part are planned on what is known as the pavilion system, being separate buildings, but having an iron bridge connecting them, to be used in case of fire or other emergency requiring the transfer of the patients. They are of the most approved construction as regards ventilation, heating, and nursing requirements, and the general aspect strikes the visitor as being one of great cheerfulness and cleanliness, especially as many kind friends bring or send flowers, which are so great an adjunct to a sick room. Many medical and other professional men have inspected the buildings, and from all the most liberal approval has been received. One gentleman, who had an ambulance and nursing class of pupils, asked permission to take the entire class in order that the members might have practical

demonstration of the lessons they had received, and they were most favourably impressed with all the arrangements made for the comfort of patients. There is accommodation for about 600 inmates, who are under the care of three resident medical officers, under whom the matron, assistant matron, and about sixty nurses are engaged.

The dispensary is very complete and well fitted, and is larger than many a pharmacy; it is lofty, well lighted, warmed and ventilated; measures about 23 feet by 16 feet, and is 12 feet in height. Here the dispenser is hard at work all day, and frequently 150 bottles of medicine, etc., are dispensed daily by this gentleman, who appears to do the work easily and well without any assistant. From a return obtained we note the following particulars:—During twelve months, 15 cwt. of lint, 9 cwt. of wool, 17 cwt. of tow were used; and of the chief drugs, cod liver oil, 50 galls.; olive oil, 45 galls.; linseed meal nearly 3 tons; quinine, 90 oz.; potassium bromide, 50 lbs.; potass. iodid., 20 lbs.; sodium salicylate, 45 lbs.; carbolic acid, pure, 350 lbs.; senega root, 1½ cwt.; confection of senna, 170 lbs; and spirit of wine, 24 galls., were required.

The work of the dispensary may be divided into two parts:—

1. The making of various preparations according to the pharmacopœia and private formulæ. These include tinctures, infusions, ointments, compound powders, pills, syrups, and stock mixtures.
2. Dispensing the medicines for the infirmary, workhouse, and out-patients.

The morning is devoted as much as possible to the former purpose, and the afternoon to the latter. The number of prescriptions dispensed annually is about 45,000, including infirmary, workhouse, and out-patients, giving a daily average of about 145, the lowest number in one day being 60 and the greatest number 275. This latter was during the epidemic of influenza.

The kitchen is on the ground floor of the administrative block in the centre of the building, and from this central hall everything not included under the term nursing is under the immediate control of the matron and officials. The fire hose, gas taps, and electric bells are all available in this department in case of need.

The infirmary is managed by a committee of fifteen members, including at present two ladies, two medical men (retired), and two chemists (one of whom is chairman), and therefore a very fair and wide experience of the knowledge required is obtained. Separate locked cupboards are kept in each ward for medicines to be taken internally, and poisons for external use, and every nurse

has the most stringent instructions to exercise great care in using them.

As showing the cost from a medical point of view in this institution, we find the expenditure is as follows:—

Average daily number of inmates under treatment, 453.

Cost of maintenance of inmates, £8627 per annum.

Cost of maintenance and salaries of officers, £6092 per annum.

Medicines and surgical appliances, £463 per annum, together with many incidental and minor amounts, such as for renewing furniture, bedding etc.

The medical officers receive salaries ranging from £400 with house to £80 per annum with board, lodging, etc., and the dispenser £140 per annum, outdoor. The most improved appliances are provided for the proper discharge of the duties of the medical staff. The operating theatre, lighted from the roof and with double doors to exclude cold or draughts, is equipped most admirably with everything experience can suggest for the purpose it is intended to fulfil.

A most useful feature of the infirmary is the training of nurses, and no less than thirty-seven probationers are here undergoing a course of three years' training. They are drawn from widely different ranks, and find, in nursing the sick, most congenial woman's work. They receive £12 per annum with board and lodging during training, and after passing the requisite examination, are eligible for the position of staff-nurse, and usually receive £25 to £30 per annum. They have a separate nurses' home apart from the infirmary building; sitting and dining rooms for their exclusive use are also provided.

Here is one field of work for women, not only quite unobjectionable in its character, but also most beneficent, which many are eagerly availing themselves of, and are finding a most desirable sphere of labour.

Hydraulic lifts are fitted to each floor, and a sub-way communicates with every part of the building; by this means the food is rapidly sent from the kitchen to each ward, thus keeping it hot, and therefore better relished by the patients.

Spacious outdoor airing courts and also a covered gallery are provided for those patients who are able to use them, and here one may see and experience the satisfaction that is felt by those who are soon to be again fit for work. The Medical Superintendent has authority also to recommend certain cases to be sent to convalescent homes at the seaside, and the guardians have several inmates in such institutions at the present time. Surely all this is good work undertaken by the ratepayers for those who are unable to provide for themselves, and on the

whole we must come to the conclusion that the Kensington Infirmary is arranged and conducted on most humane and liberal ideas, and the guardians and parishioners may well feel proud of the work done by their infirmary.

DIPHTHERIA ANTITOXIN.

In a letter contributed to the *Times* and other papers on Wednesday last, Sir JOSEPH LISTER, writing as Chairman of the Council of the British Institute of Preventive Medicine, states that a perfectly satisfactory diphtheria antitoxin has been prepared by the Institute, and that it is now proposed to produce it "on a very much larger scale, so as to be able to supply the great and ever-increasing demand of British practice." He also remarks that it appears to be a property of this antitoxin to confer temporary immunity with a single administration, the duration of the immunity being amply sufficient to protect attendants on diphtheria patients from an attack of the disease. It is reported by the Press Association that, as a result of the antitoxin treatment, a child under a year old, at St. Bartholomew's Hospital, has recovered from an acute attack of diphtheria. According to the published statement, tracheotomy had already been performed when the anti-diphtheritic serum was applied with successful results.

DISINFECTION IN HONG KONG.

In a report presented by Messrs. W. E. CROFT and FRANK BROWNE, Government analysts, Hong Kong, the work of disinfection during the plague is described. Experiments having been made in the Government Laboratory, selection was finally made of free chlorine, evolved from its combination with lime by means of diluted sulphuric acid, as the disinfecting agent. Half a pound of chlorinated lime was well mixed with a quart of water, in a vessel placed in the centre of the infected room, and a quart of the diluted acid (1 in 5) added. Fifty soldiers and thirty-six coolies carried out the work, and the amount of chemicals used was: chlorinated lime, 5100 lbs.; sulphuric acid, 600 lbs. These articles were manufactured in Japan, whence they were imported, and are described as being of good quality, the chlorinated lime containing 34.7 per cent. of available chlorine, while two samples of the sulphuric acid contained 98.1 and 88.1 per cent. of real acid respectively.

A COMMERCIAL COURT.

ACCORDING to the *Standard* it is proposed, the suggestion of the Council of Judges, that the Commercial Court should be established to deal with mercantile cases exclusively. It will consist of three judges, including the Lord Chief Justice, appointed by the judges of the Queen's Bench Division, and there will also be assessors and official referees to aid in the decision of technically complicated cases.

AWARD OF THE MOXON MEDAL.

On the occasion of the Harveian celebration at the Royal College of Physicians, the Moxon medal for clinical research was presented to Sir WILLIAM JENNER.

SIR HENRY ACLAND.

UNDER the head of University Intelligence the *Times* reports that Sir HENRY ACLAND has tendered his resignation of the Regius Professorship of Medicine at the University of Oxford on the score of age and failing health. Sir HENRY is now in his eightieth year, and this is the fiftieth year of his public work, having been during that period a member of the Royal Sanitary Commission and of the General Medical Council, besides occupying many other positions of distinction. The revival of scientific studies at Oxford has been in great measure due to the assistance rendered by Sir HENRY ACLAND in the capacity of Lee's Reader in Anatomy and as Radcliffe librarian.

ANTI-POISON STOPPER.

ANOTHER contrivance for the prevention of accidental poisoning has been provisionally protected by W. H. HARGRAVE, of 50, Sparkenhoe Street, Leicester, a working man. It consists of an "Anti-Poison Stopper" in the form of a spring attached to an ordinary cork, fitting any ordinary bottle. A circular plate of sheet steel is attached to a cork by a screw, and prolongations at two sides are bent downwards so as to catch under the lip of the bottle when in position. To remove the cork, the spring must first be forced open. It is further suggested that the word "Poison" in luminous letters should appear on the top of the spring, as well as on a label in front of the bottle.

INSTITUTE OF CHEMISTRY.

AMONG the successful candidates for the Associateship of the Institute of Chemistry at the examination held this month appear the names of Miss L. E. BOOLE, who has been for some time a student in the Research Laboratory of the Pharmaceutical Society, and Mr. F. H. CARR, the selected candidate for the Salters' Research Fellowship in Chemical Pharmacology, tenable at the same institution. Out of the seventeen candidates presenting themselves for examination thirteen were successful.

THE CHEMISTS' BALL.

As will be seen by reference to page vi. of our advertisement columns, a meeting will be held at 17, Bloomsbury Square, on Monday next, November 5, at 2.15 p.m., for the purpose of making preliminary arrangements for the ensuing chemists' ball. Any gentleman willing to assist, but unable to be present at the meeting, will oblige by informing the Honorary Secretary, Mr. A. J. PHILLIPS, 156, Cromwell Road, South Kensington, of his intention without delay.

FESTIVITIES AT MARGATE.

IN the place of the usual mayoral banquet, the Mayor and Mayoress of Margate (Alderman and Mrs. E. S. WOOTTON) gave a ball on Thursday evening, October 25, at the Cliftonville Hotel. About two hundred and thirty persons were present, and the entertainment was of the most enjoyable character. Mr. WOOTTON was in business as a chemist and druggist before August 1, 1868, and is the proprietor of one of the oldest pharmacies in Margate.

PHARMACOPŒIA REVISION.

AT page 357 will be found the full text of the report drawn up by the Victorian committee appointed to consider this subject and communicate with the General Medical Council. The previous reference to this report, taken from the *British Medical Journal* (see *Pharm. Journ. ante*, p. 256), was in some respects defective, but readers who are interested in the subject of pharmacopœia revision will now be able to consider the suggestions made by the Committee, and we are much indebted to Mr. SHILLINGLAW for supplying a copy of the report.

IMPURE COMPRESSED OXYGEN.

COMPRESSED oxygen is already apparently receiving attention at the hands of sophisticators, for a correspondent of *Nature* has recently tested two commercial samples and found them to be mixtures of 65 per cent. oxygen and 35 per cent. nitrogen.

EVENING MEETING IN LONDON.

THE first evening meeting of the Pharmaceutical Society for the session 1894-95, will be held at 17, Bloomsbury Square, W.C., on Wednesday, November 14. On this occasion Professor REYNOLDS GREEN, M.A., Sc.D., has kindly undertaken to deliver a lecture on "The Nervous System in the Vegetable World," which will be illustrated by means of the oxyhydrogen lantern. The chair will be taken by the President at eight o'clock.

WESTERN CHEMISTS' ASSOCIATION.

THE annual dinner of the members of this Association will be held at the Café Royal, Regent Street, W., on Wednesday, November 21, at 7 p.m., the chair being taken on the occasion by Mr. F. ANDREWS. Tickets, which are 6s. 6d. each, may be obtained of the honorary secretaries—Mr. HERBERT CRACKNELL, 17, Craven Road, W., and Mr. A. J. PHILLIPS, 156, Cromwell Road, S.W.

CHANGE OF ADDRESS.

THE Apollinaris Company, Limited, desires to call attention to the fact that its address is now 4, Stratford Place, Oxford Street, W.

CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

THE annual meeting of this Association was held on Friday, October 26, when a satisfactory report and financial statement were presented and adopted. Mr. Alderman DECK was elected president for the ensuing session; Messrs. A. IVATT, M.A., and A. S. CAMPKIN, vice-presidents; Mr. H. COOK, hon. treasurer; Messrs. C. S. ADDISON and H. R. PECK, hon. secretaries, and Messrs. CHURCH, GREENWOOD, McAVOY, PARKER, E. S. PECK, and STURTON, as other members of the committee. After Mr. A. S. CAMPKIN had presented his report as delegate to the recent British Pharmaceutical Conference meeting, an inaugural address was delivered by Mr. Alderman DECK, who summarised the work of the past year, and congratulated the members on the prospects of the Association, whilst urging the younger members to take advantage of the opportunities afforded them in Cambridge of acquiring a scientific knowledge of their business.

Transactions of the Pharmaceutical Society of Great Britain.

FIRST EXAMINATION RESULTS.

A meeting of the Board of Examiners for England and Wales was held on Wednesday, October 31st.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

Annesley, Sara.....	London.
Cuff, Sidney.....	New Barnet
Fuge, Dingley Palmer.....	London
Hickman, Frederick Stanley.....	London.
Kemish, Luther.....	Downham Market.
Westlake, Lionel Leopold.....	Windsor.

The report of the College of Preceptors on the examination held on October 9 was received.

Three hundred candidates had presented themselves for examination, of whom one hundred and fifty-nine had failed.

The following one hundred and forty-one passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students:—

Abrey, Richard Blake Henry.....	Battersea.
Adams, Robert Alexander.....	Glasgow.
Arnott, John Sinclair.....	Salcoats.
Austin, Henry William.....	Nottingham.
Baldwin, Percy Montague H.....	Greenwich.
Ball, Joseph Elijah.....	Mountsorrel.
Barnes, Henry.....	Derby.
Bateman, Arthur Richard.....	Christchurch.
Bathurst, Ernest Frank.....	Tewkesbury.
Boardman, Herbert.....	Leigh.
Bosticey, William George.....	Manchester.
Boyd, John.....	Annan.
Bradbury, James Roy.....	Blackpool.
Bradford, John Finnie.....	Liverpool.
Bramble, George Oliver.....	Burnham.
Buchan, Andrew.....	Edinburgh.
Burchinshaw, Robert Lloyd.....	Colwyn Bay.
Campbell, Robert Spencer.....	Abergavenny.
Cawwell, George Adama.....	Old Basford.
Chambers, Maxse William.....	New Watnall.
Clapp, Reginald John.....	Birmingham.
Clark, Alexander Robertson.....	Brighton.
Clitherow, Herbert George.....	Birmingham.
Coghlan, Frederick Daniel.....	Carrington.
Cook, William.....	Runcoorn.
Cooper, James.....	Leicester.
Craft, Charles.....	Reading.
Davis, Rowland Hughes.....	Ruthin.
Davis, Oliver Charles Minty.....	Weston-super-Mare.
Dawson, Frederic William.....	Birmingham.
Donaldson, James.....	Newcastle-on-Tyne.
Eades, Joseph Edward.....	Tipton.
Earby, Ernest Augustus.....	Walsoken.
Edwards, John.....	Nottingham.
Edwards, William.....	Bridgend.
Ellis, Ellis William.....	Fachwen.
Evans, David.....	Barry.
Evans, John R.....	Darwen.
Farquhar, James.....	Aberdeen.
Fern, Henry Arthur.....	Maoleesfield.
Foulds, Harry.....	Stookport.
Fox, Thomas James.....	Portsmouth.
Fraser, John.....	Dumfries.
Freeman, John Henry.....	Birmingham.
Gamlen, Percy Hornsey.....	Hartlepool.
Gelling, William Hiram.....	Douglas.
Glennie, George Ruddiman.....	Aberdeen.
Grant, William Low.....	Arbroath.
Groves, Thomas.....	Long Eaton.
Hallgarth, Harold William.....	Thorne.

Hamilton, Walter Louis G.....	Edinburgh.
Hanbury, Alfred Cornelius.....	London.
Hankinson, Herbert Stanley.....	Liverpool.
Harris, William Edward.....	Kingston-on-T.
Hebron, Daniel Robert.....	Bradford.
Hetherington, Vernon.....	Winchester.
Hodge, John.....	Hayle.
Hughes, Arthur.....	Llanidloes.
Hutton, John.....	Edinburgh.
Irvin, John Wallis.....	Hartlepool.
Isserlis, Isaac.....	London.
Jenner, Thomas William.....	London.
Jones, Geo. Gilbert Tudor.....	London.
Kemp, John Wallace.....	Gosport.
Kershaw, Richard.....	Luddenden Foot.
Krause, Harry John Godfred.....	Grimsby.
Lambirth, Henry Benjamin B.....	Winchester.
Langton William L.....	Leicester.
Layland, John.....	Wrightington.
Leak, Percy James.....	Uttoxeter.
Lewis, Moritz Avon.....	Pensance.
Low, John Grieve.....	Edinburgh.
Macartney, William.....	Belfast.
McBeth, John James.....	Aberdeen.
McDonald, John.....	Old Meldrum.
Macdonald, William.....	Inverness.
McDonell, Donald.....	Inverness.
McGavin, William.....	Preston.
McLean, James.....	Conon Bridge.
MacLennan, Kenneth J. C.....	Arbroath.
Martin, Wilfred.....	Romford.
Milne, James Robertson.....	Dundee.
Monkman, John Raphael.....	Harrogate.
Moss, Bertie Victor.....	Coggleshall.
Nathan, Hyam.....	Edinburgh.
Neale, Tom.....	Leicester.
Newman, Reginald Travis.....	Hadleigh.
Nicholls, Katie Amelia.....	Hackney.
Oliver, Ada Kate.....	Plymouth.
Park, James.....	Denholm.
Peacock, Frederick.....	Darlington.
Pearce, Frederick.....	Dulwich.
Penney, Harry Clayton.....	Chichester.
Powell, Bertram Henry.....	Sutton Coldfield.
Pratt, Dudley Leonard.....	Paddington.
Price, Evan.....	Rhayader.
Puddephat, Isaac James.....	Coventry.
Read, Robert.....	Thorne.
Rhead, Alfred.....	Milton.
Richards, Frank R. G.....	Maoleesfield.
Riddell, James H.....	Glasgow.
Ridgway, James Herbert.....	Patricroft.
Roberts, John.....	Bangor.
Robson, William Taylor.....	Berwick-on-Tweed.
Rogers, Ernest.....	Wolverhampton.
Rogerson, Bernard Arthur.....	Bradford.
Sarre, Leonard.....	Brighton.
Scott, Charles Edward.....	York.
Selby, Horace Walter.....	Sevensoaks.
Shorrook, Mary.....	Darwen.
Shrive, William Ernest.....	Cambridge.
Simpson, George.....	Dufftown.
Sliviter, William Oscar Bull.....	Birmingham.
Sleep, Alfred.....	Plymouth.
Smalley, Robert.....	Preston.
Smeddles, George Roger.....	Barrow-in-Furness.
Smith, Daniel.....	Nairn.
Smith, May.....	Norwich.
Smith, Percy Lewis.....	Hanwell.
Smith, Walter.....	West Hartlepool.
Smith, William.....	Newcastle-on-Tyne.
Solomon, William Denton.....	Birkenhead.
Starkey, Tom.....	London.
Stephenson, John Gathorne S.....	Manchester.
Tetlow, Frederick Arthur.....	Salford.
Thomson, William.....	Inverarity.

Turnbull, Charles S.	Greenock.
Wain, Arthur	Nottingham.
Waldon, John	Bideford.
Wall, Francis Henry	Bridgnorth.
Walls, John, jun.	Glasgow.
Ward, Samuel	Skegby.
Watson, John Anderson	Dingwall.
Webster, Thomas	Bangor.
Whittaker, Robert	Darwen.
Williams, Thomas John	Treforest.
Wilson, Richard Mackie	Ayr.
Wilson, Thomas	Linlithgow.
Withers, Edgar	Walsall.
Withnall, Nahor	Manchester.
Young, Charles	Newport-on-Tay.

The questions set at this examination were published in the *Pharmaceutical Journal* for October 13, p. 300.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result :—

Candidates.				Candidates.			
Exam.	Passed.	Failed.		Exam.	Passed.	Failed.	
Aberdeen	13	6	7	Lancaster	4	3	1
Aberystwith	2	2	0	Leeds	8	4	4
Birmingham	21	11	10	Lincoln	1	0	1
Brighton	4	3	1	Liverpool	10	6	4
Bristol	2	1	1	London	33	17	16
Cambridge	3	1	2	Manchester	27	15	12
Canterbury	2	1	1	Newcastle-on-T. ..	8	1	7
Cardiff	11	4	7	Norwich	7	1	6
Carlisle	6	3	3	Nottingham	19	12	7
Carmarthen	5	0	5	Oxford	3	1	2
Carnarvon	10	5	5	Pensance	3	2	1
Cheltenham	1	0	1	Peterborough	1	1	0
Darlington	5	4	1	Plymouth	5	2	3
Dundee	11	4	7	Sheffield	3	0	3
Edinburgh	18	8	10	Shrewsbury	4	1	3
Ereter	5	1	4	Southampton	8	5	3
Glasgow	17	6	11	Worcester	1	1	0
Hull	6	3	3	York	5	1	4
Inverness	8	5	3				

Proceedings of Societies in London.

THE INSTITUTE OF CHEMISTRY.

At the examination in Practical Chemistry for admission to the membership of this Institute, held at the laboratories at 30, Bloomsbury Square, from the 9th to 12th inst., seventeen candidates presented themselves, of whom the following thirteen were successful:—W. H. Archdeacon (Yorkshire College, Leeds); M. Barlow (Royal College of Science, Dublin); Miss L. E. Boole (Pharmaceutical Society's Research Laboratory); F. H. Carr (Finsbury Technical College and Pharmaceutical Society's Research Laboratory); J. E. Feilmann, B.Sc. (University College, Nottingham); E. Halliwell (Yorkshire College, Leeds); E. S. Ianes (Finsbury Technical College); H. Hastings (Yorkshire College, Leeds, and student under W. Russell, F.I.C.); P. H. Jones (University College, Liverpool); W. T. Rigby (University College, Nottingham); S. Robertson (Glasgow and West of Scotland Technical College); E. T. Shelbourn (University College, Nottingham); and W. Thomason (University College, Liverpool).

The examiners were Professor Wyndham R. Stanan, M.A., F.R.S., and Mr. Thomas Fairley, I.C.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of this Association held on Thursday, October 25, the President, Mr. R. H. Jones, in the chair, a paper, of which the following is an abstract, was read :—

CHEMICAL AND PHARMACEUTICAL SIGNS AND SYMBOLS.

BY T. TICKLE.

The mystic symbols which adorn the show bottles of pharmacies perhaps help to impress the pharmacist's customers with the depth of mystery there is in his art. Formerly, they constituted a system of shorthand and secret writing for the substances with which the apothecary or alchemist dealt. As far as can be shown, they were arbitrarily chosen for the greater part. Everyone invented symbols for his own use, and the result followed that the symbols employed by different men varied very greatly. No less than fourteen different symbols for lead have been handed down to us; and not only can no one of them be put down as a modification of another, but no two of them appear to have any connection.

The seven common metals were supposed to be connected in some mysterious way with the seven greater heavenly bodies, and the same symbol was applied to each heavenly body as to its appropriate metal. The metals were apportioned to the deified heavenly bodies as follows:—Gold, the Sun; silver, the Moon; quicksilver, Mercury; copper, Venus; tin, Jupiter; iron, Mars; lead, Saturn.

Rodwell, in his interesting book, "The Birth of Chemistry," says:—"It is difficult to say how the symbols conferred upon the planets and afterwards upon the metals arose. They are undoubtedly of Chaldean origin, but to what extent they have since been modified no one can tell."

Dr. Pereira, in his "Selecta e Prescriptis," gives a very credible and interesting idea of the origin of some of the symbols. He derives them all from the symbol of gold and the Greek cross which he takes to represent acrimony, the word acrimony meaning the substance of corrosive property which, combined with gold in different proportions, produced the various other metals. The crescent, he says, indicates the property of being half gold, for one side is like the symbol for gold while the other is the same reversed; that is, if you turn the inner part of the crescent outwards you have the symbol for gold. Copper has the sign of gold on the top, because of its colour, and the sign of acrimony beneath. Quicksilver derived its symbol from that of silver on the top from its colour, that of acrimony beneath, and that of gold between, for, like all the metals, gold was supposed to lurk in it combined with acrimony. Iron was supposed to contain acrimony of a different nature from that of the other metals, being represented in this symbol by the barbed spear-head.

Certain symbols seem to be closely associated with the doctrine of Aristotle, who taught that the four so-called elements—fire, air, water, earth—each had two qualities, one of which was common to some other element. Thus he said: Fire is hot and dry, air is hot and moist, water is cold and moist, earth is cold and dry. The properties making up fire and water were directly opposed to each other, and so were those of air and earth.

He pushed the connection still further, and said if the dry of fire be overcome by the moist of water, air will be produced, and likewise if the hot of air be overcome by the cold of earth, water will result. The idea expressed in this is in accordance with that which has lurked in the minds of philosophers for a long time, namely, that all matter is evolved from one substance.

A discussion followed the reading of the paper, in which the Chairman and Messrs. Moore, Robins, Sage, Plant and Morley took part. Mr. Tickle having replied, had a vote of thanks accorded him. The proceedings then terminated.

Provincial Transactions.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

A special meeting of the chemists of Nottingham and district, convened by the Nottingham and Notts Chemists' Association was held at the Eagle Restaurant, Nottingham, on the evening of October 26, when, in response to an invitation from the local executive, Mr. R. D. Gibbs (President of the Midland Pharmaceutical Association) and Mr. H. Kemp (President of the Federation of Local Chemists' Associations) read papers which raised an interesting discussion. The chair was occupied by the President, Mr. R. Fitzhugh, J.P., and in spite of the inclement weather there was a fairly large gathering.

Before the proceedings commenced, the following new members were elected:—Messrs. E. Gascoigne, Abbott, Wildgoose, Sinclair, Cook, Gelsthorpe (Nottingham), Greaves (Ironville), Adams (Mansfield), and Potts (Ilkeston).

The Chairman, having briefly opened the meeting, called upon Mr. R. D. Gibbs to read the following paper:—

HINDRANCES TO SUCCESS.

BY R. DARTON GIBBS.

I propose to take up a short period of time with you in discussing some difficulties that prevent us maintaining our position. Although the title suggests a great deal I shall limit myself as much as possible, because it is more important to emphasise a few points than mystify you with many. In dealing with some obstacles on the road to success I must point out that if you want to find them you will have to have started on that journey, and that the man who sets himself down and makes no effort will never know, and will probably never care, what the obstacles are. That individual will not have taken the trouble to come here to-night, and therefore I may safely assume I am addressing myself to a number of earnest men who desire to display all those characteristics which are to be found associated with success.

I would bid you notice that in these local associations the most prominent men, the men who give time and work and money to make them a success, are those who have had the larger share of success in their own work, men who know what the hindrances are, and who show an anxiety to clear them away, so that pharmacy may not be stagnant, but show the same signs of progress which are to be found in other departments of human activity. Gentlemen, there are some special difficulties that arise from our somewhat complicated position, and in my address at the opening meeting of the Midland Association I found it necessary to trace the lines we had followed in order that we might be quite clear as to where we were. I showed that our existence was brought about by a set of circumstances that would now be considered abnormal, and that we are liable to changes that may threaten that existence which was called into being by the wants of the physicians embodied into a society with the druggists, by the activity of the Society of Apothecaries, and that, strengthened and solidified by education, we became what we are, submitting ourselves to examination as a voluntary act, and attaching ourselves to a

society whose interests were our interests, the bonds of that union it was not our interest to break. Such was our position prior to 1868. It may help you to understand this position better if I refer to a society whose relations with the public correspond very closely with ours, the Institute of Chartered Accountants. Of both auditors and pharmacists it is said they should show proof of technical skill, and that the public should have some guarantee that those upon whose skill they are relying are qualified and honest. Now in 1880 the Institute obtained its charter just as we did eighteen years earlier. To be a chartered accountant you must submit yourself to a voluntary examination over which the Institute has absolute control, and prove your capacity as an accountant, you must continue to subscribe to its funds year by year, and expect to have your name struck off its rolls if found guilty of unprofessional conduct. The accountant does not seek the examination table to satisfy any requirement of law, but in order that he may be received into a society, may be a member of that society, be supported by the society, and gain the distinction of being a chartered accountant. The moment he separates himself from that society he reverts to his former position, and so you find the Institute is powerful because united, and united because held together by the most powerful inducements. Well, gentlemen, this was our position once; it is not so to-day. At an unfortunate moment we accepted the responsibilities and expenses of an Act of Parliament, what we asked for, but which Parliament granted, and this has proved indirectly the greatest hindrance to our advancement. You may cast some doubt upon the correctness of my views, but I would ask you each to study the development and progress of pharmacy from 1842 till 1868—sixteen years—and the twenty-six years which have since passed, and I have no doubt in my mind that you will recognise, let the exact cause be what it may, that the Act did not bring expected blessings to pharmacy or pharmacists which were looked for, and that I shall be right in directing your attention to this Act for a solution of the difficulty.

Now, I have pointed out the condition of pharmacy under an incorporated society depending upon membership. The examination was of secondary importance—that is to say, it was the river you must cross to get into the promised land. The promised land was the goal. It was your interest to get there; it was your interest to stay. It was equally your interest to remove those who would not conform to the well-being of the whole. What have we substituted for this? A society that is so far independent of you that it can afford to say we are not dependent on membership, we can get our revenue in other directions, and so if membership ceased it would effect us only in degree.

Is that a society calculated to be of use to you and show signs of progress? When a society ceases to be dependent on membership, members may cease to depend on it. And how does this work out in practice? Why, four-fifths of the examined men find it cheaper to look on from the outside, leaving one-fifth only to subscribe to its funds. Now you are left from time to time, Well, if you will stop outside you are the stumbling block to our progressiveness. Does anyone, after twenty-six years of experience, after twenty-six years of preaching, after twenty years of results, seriously think the time will ever come under the present rule when the whole body of men will be persuaded that membership of the Pharmaceutical Society will prove their salvation? Is it too great an effort of the imagination. But what has brought about this change? Was it that 1868 Act? Gentlemen, I want you to think the subject

at yourselves. I do not want to do other than direct your minds generally; it is together we must work if we are really anxious to be of help. I have indicated what the 1868 Act destroyed. What did it give us in return? A register, not of members, we had that before, but of examined men. It placed the examination as the aim and object of every pharmaceutical aspirant, instead of the Society. This was quickly discerned, and cramming schools were soon established for manufacturing pharmacists on the "payment on result" principle. Then you got a poisons' schedule, and the privilege of selling those very seldom called for articles to the public in small quantities; but if a man wants, say, a pound of cyanide of potassium, anyone can sell it on the plea of a wholesale transaction. This poison arrangement was not passed in recognition of our increased abilities, but distinctly in the so-called interest of the public, which needed protection twenty-six years ago, when the world had a poisoning epidemic. You cannot attach much value to this in return for what you lost. Now what have you got beside? Are you the producers of pharmaceutical preparations as you might be? Are you the dispensers of medicines? Are you not individual, isolated beings, each struggling for existence, depending on a society which has become valueless because State-ridden?

Suppose the plumbers form themselves into a society, and submit themselves to a proof of their skill, and then are able to call themselves registered plumbers. It may be of great value to a man, and also the public, because it distinguishes him as a man upon whom you can rely, and in so doing gives him an advantage over the not qualified and unsupported man; but suppose this society has no control over him, has not the public lost the virtue of its guarantee? And if the examination was fixed, not by the Society of Plumbers, whose interest it would be to maintain its quality, but by a State department, would not the value still further decrease? And then you have only a bringing down the standard until every man with a most modest education can walk through, and its entire value is gone, both to the man and the public. That is about our position.

The next hindrance to success is to be found in ourselves. It is apathy; it is to be traced through the history of pharmacy. There have always been a few active men, or I suppose results would have been different. The busy ones do the work, the lazy ones grumble. So long as apathy reigns, so long will there be no signs of progress. Why are pharmacists so apathetic? Is it the smell of the drugs that produces this effect? Is it that he thinks the State must some time regain consciousness of its injustice and grant us some relief, or is it that we have got into a bad condition by long hours of labour, by living to ourselves, moderating our wants, and being content to struggle on from day to day waiting for something to turn up? Whatever it is we must seek a remedy. Doctors deal with these cases by advising long holiday, by dragging you out of yourselves by cheerful company and amusement, and in this direction I attach great importance to these local associations in bringing you together in a social way to talk over your difficulties and seek pleasures in so doing. I was reminded last Thursday that twenty-five years ago we in Birmingham could only get six men together where we can now get eighty, so that we think our association has been useful if only in this way, although it is very far from being what we hope for in the future.

The next difficulty lies within these associations, in the want of a programme or policy. The power of association is in direct proportion to the clearness with which associated interests and the end in view is

defined. I commend this to my friend Mr. Kemp, who will deal somewhat with this part of the subject. Define clearly the objects to be gained by associating, and you will have gone a long way towards success. If some of you would take trouble to attempt a solution of some of the difficulties, and give his ideas of how he would deal with them in short papers at your bi-monthly meetings, leaving you to discuss them in a friendly yet earnest way, I feel sure many meetings would not pass without your being able collectively to send some valuable suggestions to other associations which would discuss them and give you their views, and so the thing would grow until it gathered a force that would become irresistible.

Now, I do not want to mystify by taking hold of too many points, as we shall gain most by emphasising a few important ones. I have pointed out three hindrances—one to us as individuals, one as an association, and one as to the central society. You cannot separate these hindrances; they act and react on each other. Whatever apathy the individual displays, under the surface will be found all those forces which impel men onward. That human restlessness to which we look for progress is not given equally to all men, but all men have it. Show a man how he can help himself to success, and he will not be wanting as a pupil. It is to success we are all looking—the difference is to be found in the way we seek it. Combine our energies and we shall get it; separate our forces and act in opposition, and waste results. It is the interest of the individual to attach himself to those whose interests are his interests, to be dissatisfied with what is, and seek together for a higher and better position, always keeping in mind that the material success of life depends upon rendering the most valuable services to mankind. The whole of human energy springs out of "I want." It has no limits. Man is never satisfied. There are always wants, and there always will be, but with what difference! How may the peasant live to-day like a king of old, and who can foresee the luxuries of to-morrow which will be the necessities of the day after? Then, seeing these limitless wants, why any petty jealousies? May it not be due to another form of apathy, which finds it easier to copy than to originate—easier to act as the agent of other people than to seek to render direct service. What is the value of all the time and money spent in pharmaceutical education if the outcome is only to result in being distributors of other people's goods, a position as easily filled by the uneducated and unqualified? Surely if pharmacy is to be worth anything it can only be by each adding something new to the world's store of utilities. There is as large a field of usefulness associated with the calling of a pharmacist as is to be found in any other department of human activity, but it is the activity that is wanted. This activity should show itself in an individual educating process, that constant seeking after information and usefulness, that coming "up to date" process which is as necessary with us as with other departments of life, and nothing is so likely to help forward this work as a strong association working together with these aims. Gentlemen, I must thank you for allowing me to take up so much time, and to express my desire for your individual and collective welfare, and to hope these meetings will help to bring the results we are hoping for—a brighter day for pharmacy and pharmacists.

The following paper was next read:—

LOCAL ASSOCIATIONS AND THEIR FEDERATION.

BY H. KEMP.

It is not my intention to traverse the ground covered by Mr. Gibbs, and it would be improper for me to criticise either his facts or his arguments. I am, however, bound to say I do not agree with some of his

contentions, and I fail to see that a compulsory examination is in any way responsible for the unsatisfactory condition of things during the period of twenty-six years which has elapsed since the passing of the Act of 1868. I must leave it to you to discuss the points which he has raised, confining myself to the consideration of local associations and their federation.

The fact that I have for some time past taken an interest in local pharmaceutical associations, and have been thrust into a rather prominent position in connection therewith, is, I take it, your reason for inviting me to come and speak to you on this phase of pharmaceutical work. And in response to your invitation I have come, not to flatter but to speak straight.

To you who have identified yourselves for so many years with the work of this Association, who have striven to awaken a more healthy sense of duty, and to bring about a truer spirit of unity among the members of your craft, all honour is due. To see these small gatherings larger, more inclusive, and, at the same time more effective, would, I am sure, be gratifying to everyone, and you would feel that your unselfish labours on behalf of the trade generally had been in some measure rewarded. I am bold enough, however, to think your experience in Nottingham does not differ much from that of other towns. A few earnest, energetic men are found year after year providing the funds and doing the work as much in the interest of others as themselves, whilst the many stand by in utter indifference. Red hot opposition one can sometimes appreciate, but this cold indifference is at times most exasperating, whilst the man who shelters himself behind all kinds of excuses for taking no part or interest in your work is beyond my understanding.

The principal objects of local associations are the promotion of unity and good fellowship, and the protection of our legitimate trade interests. Nothing is more needful than the latter or more desirable than the former of these objects, and any reasonable means which are capable of adoption for bringing about these ends are worthy of your best consideration; and every chemist whether in business on his own account or acting as an assistant ought to look upon it first as a duty and secondly as an honour to be connected with them, and to render every possible help to make them a power for good to the trade at large.

I said one of the chief objects of all these local associations is the protection of our trade interests. Although this applies generally, there has been an exception. When we—the interim committee appointed in this town last year—sent out our circular to the various secretaries or presidents we received a reply from one gentleman whose candour we could not help but admire. In explanation of the fact that he was answering ours without first conferring with any of his *confrères* in the same city, he said their rules did not admit of the discussion of trade matters for the reason—(make a special note of this!)—for the reason that those associations which permitted the introduction of trade topics soon become defunct. He then added that he had, moreover, not called his association together to consider the circular because, forsooth, it was in a moribund condition, that no meetings had been held for some years, and for all practical purposes it was dead. Since it could not be the discussion of trade matters which had brought that society down, it would be interesting to have the opinion of his colleagues as to the cause of its premature decay. At the same time I can refer that gentleman, and any others interested, to the associations of Nottingham, Birmingham, Liverpool, Glasgow, and Manchester, as instances of associations which

do admit trade questions, and are by no means dead.

With this one notable exception, I think trade questions and questions of pharmaceutical policy have occupied as much of our platform as the reading of technical papers, and without desiring for one moment to under-estimate the value of the latter, I feel justified in saying that greater interest is taken in the former by a large majority of the members. And I commend this to you—to you who are present, and to that still larger company, the whole trade—foster the associations you have, and, where none exist, form others. To those who are members I say, “stick to your local associations”; and to those who are not let me urge you to take an interest in this work. That to point a moral as well as to adorn my tale, I say, all, “Don’t forget the association whose rules ban trade topics.”

As any movement which is, in even a small degree, calculated to increase the interest taken in local or national pharmaceutical affairs, or to enhance the efficiency of your counsels must commend itself to your judgment, it is my pleasure to give you my reasons for believing that a federation of local associations will go far to meet a long-felt want in the directions.

Has it never occurred to you who are members of your deliberations, no matter how wisely directed, and your decisions, be they ever so unanimous, rendered futile in most instances by reason of the fact that you are such a small, very small, part of the trade that you are unable to exert any real influence one way or another outside your own immediate area? It must have thus presented itself to your minds often and again. Then, after deploring the fact, you have wondered whether any good to yourselves or to pharmacists in general could come out of your consultations and discussions, and whether after all they were not a waste of time. At the same time, has it not occurred to you that if you were in touch with several of the small societies, and had the support of the trade in other parts of Great Britain, some good might result? Of course your mind has dwelt upon this possibility too.

A few months since, we were entertained here while by a desultory correspondence running through the trade journals upon the merits and shortcomings of a new pharmacy Bill. I do not go so far as to say that no good comes of this kind of discussion, but maintain that it is impossible for an opinion of value to be formed from it of the effect this proposed legislation has on the great body of pharmacists. Small a matter as it first seemed, I should like to have had it under discussion by chemists in every district throughout the country, and, if approved, resolutions in support of it sent to the Pharmaceutical Council.

Actions of this kind would materially strengthen the hands of the Council, but without any one directing body such things are impracticable, and the body has to-day little or no idea whether its labours have many admirers or few. Yet what an important matter it is! Aiming, as it does, at consolidation, concerns every man who can call himself chemist.

It may be urged that this principle could be carried too far, and every action of the Council be subject to criticism. I would anticipate this, and give it my opinion that the Council has nothing to fear from open, honest criticism, and that no man worthy of the name, who holds a representative position, would shrink from a discussion of his policy. Besides, it would afford such a splendid opportunity for the removal of current misconceptions, which in numerous instances are the cause of active antagonism, at least supine neutrality towards the Pharmaceutical Society. I am prepared to admit that discussion of policy might lead to a consideration of the suitability

a representative, but this would be a distinct vantage. The facetious editor, who last April paid the compliment of a special leader by poking fun, drew attention to a difficulty we labour under, a difficulty which my feeble letter went far to indicate, at is, the difficulty of exerting any organised effort secure the return of the best men to the Council. We must all be ready to pay our tribute of admiration to the self-sacrificing work done on our behalf by the members of that Council; it would be most ungenerous to do so, and I take this opportunity of placing on record my opinion that we never had a more energetic sympathetic Council than we have at the present time. Still, it would be mere affectation to say that no one among them could be replaced with advantage, and absurd to think that a self-serving man with "an axe to grind" might not obtain a seat on the Council. And yet, no matter how much you in Nottingham or in Manchester may be convinced of the unsuitability of a given candidate for the office he seeks we can do very little to hinder his election.

I and my colleagues believe that a federation will lead us to a solution of some of these difficulties, and enable local associations to assist each other in many ways. Rules are being drawn up, but until we are settled the definite lines upon which the Federation shall work, it would be improper for me to say what will or will not be attempted or done. But I may give you my own opinion upon one or two points, and, take the last first, I think a small executive chosen by the different associations might reasonably be asked to make a recommendation to those associations upon the election of the Pharmaceutical Council. I think, too, that same executive might, on its own responsibility or at the suggestion of any federated association, call upon the different districts to take into consideration at the earliest possible moment any action of policy which might be of an urgent character. By this means a concentration of ideas might be obtained in a short space of time, and a good judgment having been formed, a line of action might soon be agreed upon; and a small and feeble association, having met with responsive support from larger smaller and larger associations, would realise that it possessed a power it could never have hoped to win by any other means. It is too late in the day to talk about the advantages of federations, for both in our and in trade they have long since taken an important position in economics; and on purely trade matters, if we could induce a large proportion of chemists to join with us, we could wield an influence that would satisfy even our desires. But that word "governs" a great deal, so you must not expect too much from the Federation of Local Pharmaceutical Societies at first. It must proceed slowly and not too ambitious.

In all this it would be no part of our work to trench on the ground of the Pharmaceutical Society. That the only recognised body for carrying out the provisions of the Pharmacy Act, and although I firmly believe there are many ways in which we could assist it would be worse than useless to attempt to arrogate any of its duties. We would not if we could. There is a wide field open to us in other directions, and enough no really crucial questions are before us at the moment, we do not know how soon they may arise. I will have seen that there are possibilities in the direction of a practical and effective unity, and opportunities for giving effect to the action of any local association, no matter how small. There are possibilities also in another direction. By an annual meeting at a movable centre, on the plan of the late Pharmaceutical Conference, I feel sure we could do something to extend the good fellowship, which is a feature of these societies. New life would constantly be instilled into the movement. And it

would probably lead to an extension of the established association as well as to the formation of new ones.

I am fully aware that we already have an annual meeting in London, where the Council is sometimes heckled and questions of policy discussed. But, without going so far as to say that it is often uninteresting and unprofitable, I may venture to suggest that it is not popular with the provincial pharmacist. At all events, the gentlemen who usually attend are almost exclusively drawn from the metropolis and its suburbs—the same, with but little change, year by year—in striking contrast to the B.P.C.

At present there is no organisation for bringing London and provincial men together in the provinces for discussion of those topics which, as I said before, occupy quite as much of our attention as the technical ones do. It has been considered quite impracticable for the Pharmaceutical Society to hold an annual meeting of this kind in the provinces: there are, it seems, insuperable obstacles in the way, and as the B.P.C. does not countenance pharmaceutical politics we must have a meeting quite distinct, and the Federation will have to arrange for it.

Now, gentlemen, I think I have talked enough for to-night, and, although I may not have enlightened you much or told you anything that is new, I hope I have provided some of you with matter for thought. You in Nottingham have exhibited commendable aptitude in taking up this question, and I feel persuaded that in your representative, Mr. Bolton, we have a colleague possessed of both tact and energy—talents which are much required in putting a scheme of this kind on a permanent and business-like basis. I am glad to see you are making a special effort to extend your membership, and I wish you abundant success.

Mr. A. E. Beilby, in opening the discussion, said that the members of the Nottingham and Notts Chemists' Association had devoted most of their time to educating their apprentices and students. With regard to trade matters, they had shown the blindest indifference, and they ought to be grateful to Messrs. Gibbs and Kemp for having come to stir them up to some kind of interest in their material welfare. He took it that the main cause of their want of success lay in the extreme competition of modern times, a competition not merely of companies' drug stores—people who had been able to start in opposition to them by what was a mere flaw in the framing of the Pharmacy Act—but also of every kind of shopkeeper. In addition to this unfair competition, they had little opportunity of dispensing doctors' prescriptions. These were very serious hindrances. How were they to be overcome? Somewhat to his surprise, Mr. Gibbs took up the position that if they could only return to the state of things prior to the passing of the Pharmacy Act, a much better condition would prevail. Were they to return to the condition of things prior to the Act competition, in his opinion, would be very much greater. The Pharmacy Act had done a great deal for them. It had weeded out incompetent men, and he contended that they ought to be grateful for that Act, inasmuch as it had given a better education to chemists, and had given them a position through registration. The chemist was a recognised individual, and occupied a position very different to that of any other tradesman. The Act in other respects had been a distinct advantage to the trade, and what they required was to be more State-aided. A chemist was expected to perform certain duties, and in return he should have certain privileges. With regard to the sale of poisons, he thought chemists ought to demand that not only should the sale of poisons be restricted to chemists, but all galenic preparations of the Pharmacopoeia. If they would only make an effort in this

direction, he felt sure that, in spite of the free trade proclivities of the times, they would finally succeed. They had to look after their material interests, and, in his opinion, their best interests could only be secured by a more close connection with the State through the Pharmaceutical Society. With Mr. Kemp's address he was in thorough sympathy. The individual chemist was practically powerless, and it was only by collective action that he could make himself felt in the country. In addition to the local associations, he did think they ought to support the Pharmaceutical Society. That they did not get a strong Pharmacy Bill in the first instance arose from the fact that so few members of the trade were connected with the Pharmaceutical Society. If chemists would only join, they would give a democratic character to that Society, and its representations would then come with greater force to the Government.

Mr. W. H. Parker, who followed, said that his advice to the trade from the first had been that the members of it ought to join the Pharmaceutical Society, and mould its Council as they wanted it. The difficulty, however, arose with regard to membership. He had been the local secretary for many years, and he had been continually asked by chemists how they could be made members. The fact was that they could not be made members until they had passed the Major examination and become pharmaceutical chemists. They did not seem to like the title of associate, though it practically admitted them to membership. Federation, in his opinion, was the only remedy for bringing pressure to bear, and he did not know any better scheme than that brought forward by Mr. Kemp.

Mr. A. Middleton said he supported Mr. Beilby's contention as to the advantages gained by the passing of the Pharmacy Act. He wished to express his high appreciation of the scheme Mr. Kemp had foreshadowed. There were something like 15,000 chemists in the country, and if they could only get a petition signed by 15,000 chemists he was sure they would be heard upon their grievances. Other organisations of far less standing had accomplished all they desired by this means. But the simple case was that the Society, which was the recognised authority, was so badly supported that its voice was practically unheard. He would just as soon be called an associate as a member. He felt sure that the one title on the sign board or on a label would carry as much weight with the public as the other.

Mr. W. Gill (Secretary) observed that they had to take facts as they were, not as they used to be. They had a society brought into existence by the passing of the Pharmacy Act, and they must recognise that Society. He thought that to give their best support to the Society in London was the only way in which they could achieve what they wanted. He heartily agreed with Mr. Kemp's views on federation, and he would like to see the local associations not only in touch with the Federation, but with the Society in London. Unless they combined they really could do nothing.

Mr. C. A. Bolton (Vice-President) said that the reason chemists were worse off than formerly was because of their apathy. How could they get the members of the trade to take an interest in their own material welfare? Even the match girls and the cigarette makers did that, but they could not get chemists to look at things in the same way. Every man who stood outside the Pharmaceutical Society was a dead weight preventing them obtaining those privileges which were their right. He hoped that each member present would feel that the success of the Federation depended upon himself. The difficulties of obtaining legislative enactment had been referred to, but these things would never come until they were

united and they had said to the Pharmaceutical Society, "We have made our minds up on this point and are going to work for it."

Mr. Gibbs first replied. He said that the action of the Pharmaceutical Council with regard to the sale of poisons clearly showed that the days of close trade were over, and the sooner they recognised it and went on some workable ground the better. The remarks made during the discussion all seemed to tend in the same direction, and the only answer he had got was that was, that they were now worse off than a few years ago. That being so, they had better recognise the fact.

Mr. Kemp also spoke very briefly, stating that he had nothing to reply to.

The meeting closed with votes of thanks to the speakers and the chairman.

LEEDS CHEMISTS' ASSOCIATION.

The annual general meeting of the above Association was held in the Library, Leeds, on Friday, October 28, Mr. R. Reynolds (President) in the chair.

Mr. W. D. Pollitt (Honorary Secretary) read the following annual report:—"The Council, in presenting the twenty-sixth annual report, records, with regret, the death of an old member, Mr. T. B. Boulton."

"The library has been maintained in a condition of efficiency, small additions having been made during the year, and more use has been made of books and materia medica specimens by association."

"Your Council thinks that the Association has just claim for support from the members of the trade, and, amongst other reasons for that claim, we refer to the present state of pharmaceutical politics. It is highly desirable that associations such as ours should maintain their organisation, so as to be ready at any time to support the Pharmaceutical Society in its endeavours to enforce the principles of the Pharmacy Act of 1868, especially with regard to the retailing of preparations containing scheduled poisons."

The financial statement showed a balance in hand of £2 9s. 1d.

Votes of thanks were accorded to the Council of the Pharmaceutical Society for the gift of the *Pharm. Journ.*, and to the Executive Committee of the British Pharmaceutical Conference for the gift of the "Red Book" for 1893.

A cordial vote of thanks was given to Mr. S. J. Taylor (who had resigned the office of treasurer) for past services.

The following officers and Committee were elected for the coming year:—

President: Mr. Richard Reynolds.

Vice-President: Mr. E. Yewdall.

Hon. Treasurer: Mr. P. Jefferson.

Hon. Secretary: Mr. W. D. Pollitt.

Committee: Messrs. F. W. Branson, G. B. J. Day, S. Taylor, G. Ward, and G. W. Worland.

Auditor: Mr. E. Brown.

LIVERPOOL CHEMISTS' ASSOCIATION.

A meeting of the members of this Association was held on October 25, at the Royal Institution, in the City Street, Mr. M. Conroy presiding. Several members were elected, and regret was expressed that Mr. Parkinson, Local Secretary of the Pharmaceutical Society, was resigning that position, which he had held for a long period. Mr. J. Smith was elected president of the Association for the coming session, and afterwards a paper on "The preparations of the British Pharmacopoeia" was read by Mr. R. U. Cowley.

Scottish Transactions.

1ST ABERDEENSHIRE CHEMISTS' ASSOCIATION.

The annual meeting of the East Aberdeenshire Chemists' Association was held at Maud on Oct. 25. Mr. George Whyte, Fraserburgh, occupied the chair, and a letter of apology was read from Mr. McGregor, Ellon, the president, regretting his unavoidable absence. Mr. Tocher, the secretary, read the presidential retiring address, which dealt with the current topics in pharmacy. On the motion of the chairman, the secretary was directed to convey the hearty thanks of the meeting to the president. A discussion then took place on the Pharmacy Act, and on various proposed amendments which have been brought forward from time to time. Mr. John Johnston, Aberdeen, member of the Pharmaceutical Council, was present by invitation, and gave an address on the proposed pharmacy bill and its effect upon chemists and druggists. A discussion took place, in which Mr. Cruickshank, and Mr. Robert Whyte, Fraserburgh; Mr. Walker, Ellon; and Mr. Tocher, Peterhead, took part. On the motion of Mr. Robertson, a vote of thanks was heartily accorded to Mr. Johnston for coming so far to be present at the meeting. Mr. John Wilson, chemist, New Rochelle, New York, a native of East Aberdeenshire, was also present by invitation, and gave an account of the pharmacy regulations in the United States of America, which was much appreciated. Mr. John Grant, Methlick, was elected president for the ensuing year, and Mr. Tocher, Peterhead, was reappointed secretary.

Parliamentary and Law Proceedings.

PROCEEDINGS IN THE COURT OF CHANCERY.

MANDALL'S PATENT FOR LICORICINE.

The petition by the Pharmaceutical Society of Great Britain for the revocation of this patent was in a paper for hearing before Mr. Justice Chitty on Tuesday, October 27, but on it being stated that it was opposed, and that oral evidence would be required, the lordship directed that it should be put in the list of cases to be heard with witnesses. The hearing was therefore deferred. The patent (No. 6178 of 1893) is for a medicine (licoricine) for the cure of coughs, colds, croup, and bronchitis, which is composed of an infusion of liquorice root, Irish moss mucilage, gum arabic mucilage, glycerine, chloroform and morphine in the form of chlorodyne, syrup of squills, syrup of marsh mallow, ipecacuanha wine or antimonial wine, oil of aniseed, spirit of camphor, and benzoic acid.

POISONING CASES AND INQUESTS.

CARBOLIC ACID CASES.

Elizabeth Lee, aged 45, of Beswick Street, Salford, died on Tuesday, October 23, from the effects of taking carbolie acid. Verdict: "Suicide."—*Manchester Courier*.

Hannah Jenkins, aged 38, of 12, Laxey Street, Liverpool, died on Wednesday, October 24, also from the effects of drinking carbolie acid. Verdict: "Suicide. Not temporarily insane."—*Liverpool Mercury*.

Alfred Ernest Sinclair, aged 15, of Great Jackson Street, West Gorton, died on Sunday, October 28, after drinking carbolie acid and falling into a cellar. Verdict: "Died from dislocation of the spine and carbolie acid poisoning."—*Manchester Courier*.

DEATH FROM OVERDOSE OF ARSENIC.

William Horton, aged 31, commercial traveller, of Aston, Birmingham, died at Cardiff on Saturday, October 27, from the effects of an overdose of arsenic, alleged to have been taken to induce sleep (*sic*). Verdict: "Died from arsenic poisoning."—*Western Mail*.

Dispensing Memoranda.

[653.] In the following prescription the bismuth sometimes cakes at the bottom of the bottle:—

Bism. Subnit.	3ss
Liq. Calcis ad	3viii.
M. ft. mist.	

It has not been determined whether this is caused by the bismuth being excessively acid or the lime water weak, either or both producing a slightly acid menstruum; or the bismuth normal, that is, slightly acid, and the lime water full strength, thus forming an alkaline supernatant liquid. It would be interesting to know what takes place.

[654.]

R Cocain. Hydrochlor.	30 grains.
Vaselin. Alb.	1 ounce.
Ft. Unguentum	

The medical man wishes the salt to be used. Is it preferable to add oleic acid or not, and what is the solubility of cocain. hydrochlor. in vaselin. alb.?

W. F. G.

[655.] Can you give me any information as to how the following prescription for pills may be best dispensed:—

R Terebinth. Venet.	3i.
Ext. Hyococyami.	3ss.
Pulv. Rhei.	3ss.
Camphora.	gr. x

M. et divide in pil xxvj.

Sig. One three times a day.

IGNORAMUS.

Correspondence.

LEONURUS CARDIACA.

Sir.—This plant is noted by Babington, *rare*—Johns and Miss Pratt assigning for it respectively only two localities. For the first time in my experience I found it growing on a piece of waste ground that a few days afterwards was dug over as an allotment—planting it in a border it flourished remarkably well. Miss Pratt quotes an "old herbalist" who extols its virtues as superior to any other remedy, and having the power to "cause a merrie heart." The origin of the name seems obscure. The flowers grow in crowded whorls, and before their expansion suggest "aphides," in some country places of Kent termed "smother." Is it probable that the rustic etymology may have been "smother-wort?" Dr. Turton, M.D., in his medical glossary, gives "Leonurus, λεωνδρος, from λεων, a lion, and δρος, a tail—lion's tail;" "named from its likeness"—rather fanciful, it must be admitted. Anyhow, the therapeutic value of the herb is generally acknowledged, and Mr. Holmes has done good service to medicine in digging it out. Personally, I feel obliged to him for, being possessed (con-

genitally) of a heart that has puzzled all the doctors—"feeble in action, intermittent pulse; ought to give up business, etc." I naturally feel interested in any proposed remedy. Having given the infusion of motherwort a trial, I can confidently state it possesses tonic properties that are superior to the numerous drugs hitherto prescribed, and I firmly trust that Mr. Holmes may have the satisfaction of introducing a humble "indigen" to its true position as an ameliorator of human suffering, thus illustrating the text of a writer in the Apocrypha, "The Lord hath created medicines out of the earth; he that is wise will not eschew them."

Kingston-on-Thames.

R. GOODWIN MUMBRAY.

WEIGHTS AND MEASURES.

Sir,—Will you permit me to remark, touching Mr. Dott's interesting paper on "Weights and Measures," that he falls into the curious though popular error of assuming (gratuitously) that decimalists object to fractional divisions. There is no more objection to the gramme being divided into halves, quarters, or any other fraction considered convenient than there is to so dividing the grain, although practically it is found more convenient to use the decimal point. Then that "long-winded vocabulary. Well, I think even there, although a minor point, that gramme and litre are at any rate as musical and easy as say hundred-weight, quarter, kilderkin, puncheon, hoghead, let alone adopting the "parvil" of "Devoniansis." Even the cubic centimeter when written C.c. or C.cm. and vocally abbreviated into C.c. (se-se) is not unwieldy. Curiously enough Mr. Dott used an argument generally claimed by decimalists, that is that 8lbs. 13ozs. is easier to remember than 1725 grms., but it would be equally relevant to ask which is easier to remember, 18.3 Grms. or 8 dr. 1 scr. 8½ gr., which is putting it very moderately. When we compare the multiplication of such amounts as 1 lb. 13 ozs. 4 dr. 2 scr. by 17s. 4½d. with 118.42 × 17.45 we are struck with the immense superiority of a system which does away at one swoop with compound arithmetic. There is no reason why our own system of weights, measures, or coinage should not be used after being decimalised if the committee found it preferable. I think, too, the danger of missing the decimal point is over-stated. I have seen more mistakes made by confusing the 2 and 3 signs than with the decimal point, beside which a man who could deliberately mistake .01 Grm. of strychnine for ten times that quantity ought not to be trusted to calculate ¼ or ⅓ of a grain. I have in my own and other pharmacies for several years used for all purposes, except buying and selling, weights bearing simply the number of grains, thus 20, 80, 50, 60, 100, 120, 150, 250, 500, and 1000, and all entries in our prescription books are made in terms of grains and minims when the quantities are under 1 oz. Not only do my assistants take to it very readily, but in all cases prefer it. The fact is we have come to look on our old system of weights and measures as a sort of "Divine ordinance," but it is not that. It is an incoherent jumble of incompatibles, and I do not believe that a gentleman of Mr. Dott's intelligence honestly thinks it is the "perfect system" he says it is. We have only to remark how portions of this perfect system are becoming obsolete (e.g., the 3) to see that its abandonment is only a question of time, and that English people will eventually follow the example set by every civilised country in the world by adopting a decimal system.

Blackpool.

CHAS. H. TURVER.

Member of the Decimal Association.

SALE OF PROPRIETARY MEDICINES.

Sir,—In the Journal for October 20, Mr. Vizer writes on poisonous proprietary medicines, with a reference to Powell's balsam of aniseed. I have examined half-a-dozen bottles in stock of this proprietary, and find that three bottles have a small printed label pasted on to the wrapper with this wording, "This preparation, as made since 1824, contains, amongst other valuable pectoral ingredients, a very minute and harmless quantity of opium; and, therefore, to meet the requirements of the Act of Parliament, 1868, it is labelled Poison." The other three bottles have no label indicating their poisonous nature. This may be owing to an omission on the maker's part, or to the wholesale house

having procured a stock of the balsam before the maker began to affix the printed slip. I would recommend that the declaration as to the poisonous ingredient be printed as part of the wording on the wrapper, as is done by the makers of Dr. Collis Brown's chlorodyne. The printed slip on Powell's balsam could very easily be removed, and then no clue would be given as to its poisonous composition. I am at one with Mr. Vizer in the makers of proprietary medicines should be compelled to distinctly label any nostrum containing such poisons in accordance with the Pharmacy Act. A remedy suggested of wholesale dealers placing a distinguishing mark in their price lists against proprietary medicines containing poisons has to a certain extent been adopted by Messrs. May, Roberts & Co., of Clerkenwell Road. They insert in italics below each poisonous proprietary the words "saleable in the United Kingdom by qualified chemists only." This is a plan which can be imitated to advantage by other wholesale dealers.

"CALLEDONIA."

Answers to Correspondents, etc.

"Stammerer."—You will find the publisher's address in last week's Journal. See review on page 351. Any bookseller will procure the book for you.

"Ignoramus."—Refer to Journal of September 21, p. 282, for explanation of terms you mention. Possibly you may be able to find objections to them in the review you mention, which are not evident to the average reader, but our impression, after reading the review, is that they are regarded by the writer of it with distinct approval. Read it once more, carefully and critically, and avoid confusing generalities with particulars.

"Thymus."—Examinations in the subject are held in connection with the Science and Art Department, South Kensington, and certificates are awarded on the result. You cannot do better than get Hillhouse's translation of Strasburger's 'Handbook of Practical Botany' (See Sonnenschein and Co.).

Diary of the Week.

SATURDAY, NOVEMBER 3.

Pharmaceutical Football Club v. Melville, at Wormsley Farm, Shepherd's Bush, at 3 p.m.

MONDAY, NOVEMBER 5.

Society of Chemical Industry (London Section), at 8 p.m.

"The Composition and Constitution of certain Alloys," by the late Dr. C. R. Alder Wright.

"Note on Oxidised Linseed Oil," by W. F. Reid. Royal Institution, at 5 p.m.

General Monthly Meeting.

TUESDAY, NOVEMBER 6.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

WEDNESDAY, NOVEMBER 7.

Pharmaceutical Society of Great Britain.

Council Meeting, at 11 a.m.

THURSDAY, NOVEMBER 8.

Midland Pharmaceutical Association, at 8.30 p.m.

"Tinctures and Tincture-making," by H. W. Jones. Chemists' Assistants' Association, at 8.30 p.m.

"Sneezing," by Dr. Scaues Spicer. Edinburgh District Chemists' Trade Association, at 11 a.m.

"Correspondence with Board of Inland Revenue to certain so-called proprietary medicines."

Opening remarks by Chairman on "Proprietary Medicines;" "Conditions of Apprenticeship;" "Adherence to Official Standards for Drugs," etc.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bennett, Clegg, Cracknell, Gadd, Haensel, Hart, Hargreaves, Hesse, Hill, Laing, Miles, Mitchell, Mould, Mumbray, Pollitt, Prince, Robinson, Sage, Sharp, Shillinglaw, Smith, Stephenson, Tocher, Turver, Wright.

THE CHEMISTRY OF IPECACUANHA.

BY DR. B. H. PAUL AND A. J. COWNLEY.

Since the publication of our last paper on this subject* we have endeavoured to prepare larger quantities of the salts of the two bases we then described, and in the course of our experiments have been struck with the comparative facility with which the emetine hydrochloride crystallises in the presence of an excess of acid. Upon adding moderately strong hydrochloric acid to emetine it is immediately converted into a bulky mass of fine silky crystals, whereas the formation of crystals from a neutral aqueous solution of the salt does not take place until after some considerable length of time, and the solution has become very concentrated. This difference of behaviour suggested the possibility that an acid salt was formed, but on analysis of the silky mass of crystals that was not found to be the case. Considerable difficulty was experienced in obtaining the salt in a state fit for analysis, on account of the large quantity of mother liquor retained by the crystals. Drying by heat gave a salt that was neutral, containing 12·83 per cent. HCl as previously stated.†

On pressing the spongy mass of crystals between tubulous paper the material thus imperfectly dried gave the following results on analysis :—

	Found	Calculated for $C_{15}H_{23}NO_2 \cdot 2HCl \cdot 3H_2O$.
Emetine.....	67·62	73·28
HCl.....	12·79	10·78
Water (by difference)	19·59	15·96
	100·	100·

It appears evident from these results that no acid salt is formed, though the presence of free acid promotes the crystallisation of the neutral salt. The amount of hydrochloric acid in a dry acid salt having the composition $C_{15}H_{23}NO_2 \cdot 2HCl$ would be 22·74 per cent.

Cephaeline behaves in a somewhat similar manner. A neutral solution of the hydrochloride dries up over sulphuric acid to a varnish-like residue without any sign of crystallisation. But when the solution contains excess of acid, fine, transparent rhombic crystals are formed. In this case also the salt formed is not an acid salt, as seemed to be probable. When dried over sulphuric acid it gave the following results on analysis :—

Cephaeline Hydrochloride Crystallised from Solution containing excess of Hydrochloric Acid.

	Found.	Calculated for $C_{14}H_{20}NO_2 \cdot HCl \cdot 5Aq$
Cephaeline.....	72·0	72·11
HCl.....	11·2	11·25
Water (by difference).	16·8	16·64
	100·	100·

A dry acid salt having a composition corresponding to the formula $C_{14}H_{20}NO_2 \cdot 2HCl$ would contain 23·96 per cent. of hydrochloric acid.

Indications of this remarkable tendency to crystallise in the presence of excess of acid have previously been observed in the investigation of the ipecacuanha alkaloid by Dumas and other chemists.

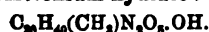
The current number of the *Archiv der Pharmacie* contains a communication from Dr. Kunz-Krause of Lausanne, in reference to the papers published in this journal on the alkaloids of ipecacuanha.* Dr. Kunz-Krause lays claim to priority in the publication of a description of the basic constituent of that drug, and of various conclusions as to its molecular formula, etc. The chief details of the results arrived at by Dr. Kunz-Krause in his investigation were stated in the following propositions, which appear at the end of the paper published by him in 1887:†

I. That emetine has the molecular formula $C_{30}H_{40}N_2O_6$, and yields a platinum salt, having the composition



II. That it is consequently a bi-acid base like quinine.

III. That it is a diamine (tertiary), since it yields, after addition of methyl, an ammonium base, methyl-emetonium hydrate :



IV. That emetine is very probably, like quinine, a derivative of chinoline.

These propositions are now republished by Dr. Kunz-Krause, supplemented by some others relating to the constitution of emetine, and they are referred to by him as representing the existing state of knowledge of this subject, for the elucidation of which Dr. Kunz-Krause claims priority. That claim, however, is at once superfluous and inadmissible, for the data we have given as the result of our observations upon the physical characters, composition and salts of ipecacuanha bases are totally incompatible with those given by Dr. Kunz-Krause, and the previous publication of his paper was duly acknowledged by us. It is not therefore a question of priority, but one of reality which has to be considered.

In the description of the results obtained in our study of ipecacuanha we furnished evidence of the existence of at least two distinct bases in that drug, the difference between them being marked by their physical characters, by their composition, and by their salts. This difference is especially indicated by one of the bases being crystallisable and freely soluble in caustic alkali, while the other one is uncrystallisable and insoluble in caustic alkali. Those observations were recorded with a full knowledge of the conclusions at which Dr. Kunz-Krause had arrived in 1887 : they did not raise any question as to the prior publication of his paper on the subject, and though they were of a nature to throw doubt upon his conclusions as to the individual nature and constitution of the base which he had described under the name of emetine, their publication is not, as he suggests, an "unjustifiable criticism" of his previous work. The reasons for the doubt as to the nature of the base are distinctly stated at the end of our last paper, and may be here briefly recapitulated.

The paper published by Dr. Kunz-Krause in 1887 contains internal evidence that the basic product obtained by him from ipecacuanha, and named emetine, was not a chemically individual substance, but an indefinite mixture of two or more of the

* See ante, p. 111.

† Ibid., p. 114.

* *Pharm. Journ.*, liii., 61, and liv., 111.

† *Archiv. der Pharm.*, [3], xxv., 461.

different bases which we have described. Thus, for instance, the sparing solubility of the substance in cold ether, its melting point, its capability of crystallising, and its comparatively considerable solubility in hot petroleum spirit, and even in water,* as well as its partial solubility in caustic potash† are characters which do not belong to the base isolated by Glénard and described by him under the name of emetine, or to the amorphous base of corresponding composition which we obtained. These are characters which approximate to, though they are not exactly the same as, those of the other base we have isolated and named cephaline.

The uncrystallisable base identical with that described as emetine by Glénard, is soluble in ether, but insoluble in caustic alkali, and very sparingly soluble in water‡. It is also very sparingly soluble in petroleum spirit, even with the aid of heat, and owing to its low melting point it readily aggregates into a mass, which is then so little acted upon by the solvent as to be almost insoluble.

Bearing that circumstance in mind, it is obvious that the process by which Dr. Kunz-Krause prepared the substance he described as emetine, viz., extraction by boiling petroleum spirit, was just of such a nature as to give a mixture consisting chiefly of cephaline with a small proportion of true emetine, and presenting characters belonging partly to one base and partly to the other. Analytical data relating to such an indefinitely mixed substance are necessarily of little value, however numerous they may be. Consequently the conclusions arrived at by Dr. Kunz-Krause as to the composition and constitution of emetine are wanting in foundation adequate for the purpose, and for that reason we abstained from entering upon a premature discussion of the views expressed by him as to the constitution of emetine, confining ourselves to a bare statement of the results of experiment.

The paper which has just been published by Dr. Kunz-Krause in the *Archiv* contains much that is irrelevant to the main issue above stated, and the settlement of that issue would only be obscured by entering into a discussion of these subordinate points. It may, however, be useful to give a comparative statement of the figures by which the percentage composition of the substances in question have been expressed.

	<i>Emetine.</i>		<i>Cephaline.</i>	
	Glénard. 1876.	Kunz. 1887.	Paul and Cownley.	Paul and Cownley.
	mean		mean	
Carbon ...	72.26	70.61	72.01	71.28
Hydrogen	8.12	7.93	8.86	8.69
Nitrogen.	5.35	5.50	5.75	6.24
Oxygen...	14.27	15.96	13.38	13.73
	100.	100.	100.	100.

We hope shortly to be able to publish further descriptions of the salts of these bases, together with an account of their physiological action.

* *Ibid.*, p. 465.

† *Ibid.*, p. 473.

‡ A solution containing only $\frac{1}{1000}$ part of the hydrochloride becomes turbid on addition of a drop of caustic soda solution.

THE TRINIDAD ASPHALTE INDUSTRY.

The famous pitch lake near the village of La Brea, in Trinidad, is probably the largest deposit of asphalt in the world. It occupies what is thought to be the crater of a mud volcano, and has an area of over 100 acres. Its depth is unknown, but borings have been made which show that at least in some places it is over 200 feet. The surface is, as a whole, so firm that it can be walked over with ease, though the rivulets and pools of water which are scattered over it at times impede progress. At one or two points, however, soft pitch is still welling up, accompanied with the evolution of sulphuretted hydrogen gas, and here a man sinks up to his knees in a very few minutes. Even the apparently solid asphalt is quite viscous, and hence the general level of the lake is slowly sinking as digging goes on. The movements taking place in the mass are illustrated by the fact that a couple of islands which were considered to be stationary have lately been discovered to be gradually moving. Besides the pitch lake there are in Trinidad some other asphalt deposits, which are, however, of no great importance. They consist of pockets of pitch, which are found in the land surrounding the lake. Whether they are the results of the overflowing of the lake at some former time, or whether they are of independent origin is a point which does not appear to be definitely settled, but it is pretty well agreed that the asphalt obtained from them is not the same as that from the lake. Physically it is less tough and viscous, while chemically it contains a smaller percentage of bitumen. Of late very little, if any, has been exported. The reason for this is partly, no doubt, its recognised inferiority for industrial uses, but more especially the fact that the concessionnaires have acquired all the ground in which land pitch exists with the exception of a little in the village of La Brea and some Crown land. From the latter, under the terms of the agreement, pitch may not be exported.

The Trinidad traffic in asphalt has only become important within comparatively recent times. Twenty-five years ago the total export was under 6000 tons. In 1882 it had risen to nearly five times that quantity, while in 1892 it exceeded 100,000 tons. The appliances for transporting the asphalt from the lake to the sea—a distance of about a mile and a half—have recently been greatly improved. Formerly it was conveyed in mule carts, and the arrangements for shipment were somewhat clumsy. Now there is an overhead tramway running down from the lake to the end of a long pier, where the material is tipped directly into the boats. By the time it reaches the end of its voyage it has run into a homogeneous mass, and has to be dug out in much the same way as it was originally from the lake.

The development of this asphalt trade is of considerable importance to the colony of Trinidad, seeing that the Government receives a royalty of 6s. 8d. on every ton exported. The income thus obtained is more than sufficient to pay the interest on the public debt, and has the additional advantage of costing very little to collect. The concessionnaires deposit

£10,000 with the Government at the beginning of the year, and pay royalties on the quantity exported over and above the 30,000 tons covered by the deposit.—*Times*.

THE PREPARATION OF COCAINE.

The complete separation of cocaine from the accompanying alkaloids found in the leaves is a troublesome and tedious operation, and has been superseded to a large extent by methods based on our knowledge of the constitution of these alkaloids.

It has been shown that the chief alkaloids found in the leaves are cocaine (methylbenzoyl-ecgonine), isatropyl-cocaine, and cinnamyl-cocaine, and they may thus be considered as built up from methyl-ecgonine by combination with different acid radicals.

'The principle of the process employed' consists in the decomposition of the accompanying alkaloids by acids, the formation of ecgonine by splitting off the different acid radicals as methyl esters, and the subsequent partial synthesis of cocaine from the ecgonine thus obtained.

The method employed is as follows:—The leaves are extracted by a suitable solvent, and the greater part of the cocaine is removed by fractional crystallisation. The alkaloidal residue, containing a little cocaine, is then decomposed by boiling with strong hydrochloric acid into ecgonine and the methyl esters of the different organic acids. Finally, the ecgonine is separated and purified, and then converted into cocaine. Two methods can be employed for this conversion: (1) The ecgonine is first benzoylated and then methylated by treatment with methyl iodide and soda, or, better, by passing dry hydrochloric acid gas into a solution of benzoyl-ecgonine in methyl alcohol (Einhorn); or (2) the methyl ester of ecgonine is first formed, and then benzoylated to form cocaine. In both cases we require to add the two groups, and for this two operations are necessary.

Einhorn has devised a method (*Bericht*, xxvii., 1523) which necessitates only one of these synthetical operations, and this depends on the fact above stated, that the different alkaloids may be viewed as consisting of methyl-ecgonine combined with different acid radicals, and instead of decomposing the total alkaloid into ecgonine, the methyl ester of ecgonine is obtained, which then only requires benzoylating to yield the required alkaloid. The method is as follows:—50 grammes of the accompanying alkaloids are boiled with 300 grammes of methyl alcohol and 100 grammes of pure sulphuric acid for 3 to 4 hours in a water-bath. The alcohol is then distilled off and the syrupy residue treated with a little water in which the methyl-ecgonine is dissolved, and the greater part of the organic acids precipitated as methyl esters. The aqueous solution is now extracted with chloroform, and then made alkaline with excess of potassium carbonate, when the ecgonine methyl ester separates as an oil, which is then easily extracted by chloroform.

A modification of this method consists in passing dry hydrochloric acid gas into a methyl alcohol solution of the accompanying alkaloids, and, after cooling, heating for two hours. The methylecgonine is separated by the same method as used when sulphuric acid is employed.

The yield is found to be theoretical, and the resulting methylecgonine was recognised as such by purification and the identity of the melting point of its hydrochloride with that previously recorded. It can be distilled with very little decomposition in a vacuum.

When the methyl alcohol is replaced by ethyl alcohol, the higher homologue of cocaine is obtained, and we have thus a simple method at command for forming any of the higher homologues by dissolving cocaine in the required alcohol, and saturating with dry hydrochloric acid gas and boiling for two hours.

The process above described depends on a very general method of preparation in organic chemistry, viz., the formation of a methyl ester by treatment with methyl alcohol in presence of sulphuric or hydrochloric acid. In this case the ecgonine is produced under conditions that at once induce the formation of methyl ecgonine, which then only requires benzoylating to yield cocaine.

CANADIAN BALSAM FIR.

While there has been little or no increase in the consumption of Canada balsam fir within the past five years, the supply has been gradually diminishing partly as a result of natural conditions, and partly because the work of gathering has been, to an extent, neglected. The collection of balsam fir is not a regular industry, but has been prosecuted by lumbermen and labourers in other fields, who devoted their leisure to it. So long as the balsam could be obtained near by the markets to which the gatherers bring it the supply was ample and regular, but with the cutting down of the Canadian forests for timber the source of supply has been further and further removed from commercial centres, and the collection of the balsam has not proved profitable enough, for a number of years past, to encourage those who heretofore engaged in it to continue to bring it to market.

In some years the supply has been larger than in others owing to the scarcity of other employment, and in view of the widespread distress among the labouring classes, including the Canadian lumbermen, during the past eighteen months or more, it would be natural to expect that these people would have turned their attention to the gathering of balsam as a means of livelihood. Such, however, does not appear to have been the case, for according to reliable reports the quantity collected this year was very small, not exceeding fifty barrels. This small yield was partly due to wet weather toward the end of the gathering season—late August and early September—but the chief reason for it is that the gatherers found it unprofitable to go so far into the interior for the balsam as they are now compelled to go.—*Drug Reporter*.

* Liebermann and Giesel. *Bericht*, xxi., 3196.
Einhorn and Klein. *Bericht*, xxi., 8335.

PROTEID POISONS.*

Proteid poisons have been obtained from both the vegetable and animal kingdoms. Thus among those obtained from plants, one may mention the proteids obtained from jequirity seeds, the proteid associated with or identical with the ferment papain of the papaw plant, and lupino-toxin from the yellow lupin.

The most important of the animal proteid poisons are snake poison; the proteids in the serum of the conger eel and other fish; and proteid poisons found in certain spiders. Poisonous proteids are also formed during ordinary digestive processes in the alimentary canal of every one of us from the proteids taken in as food. The peptones and the proteoses or albumoses (intermediate products in the process of hydration of which the terminal product is peptone) are fairly powerful poisons. 0.3 gramme per kilogramme of body weight injected into the blood will kill a dog, producing a loss of coagulability of the blood, a fall of blood pressure, a stoppage of secretions, and ultimately death by cessation of respiratory activity. Normally, animals are protected from this poison by the lining membrane of the alimentary canal, so that no proteose or peptone is found in blood or lymph even during the most active periods of digestion. The cells of this membrane possess many remarkable properties, but one of the most important is this power of regenerating albumin from peptone.

Allied to the albumoses of ordinary gastric activity are the similar products produced by bacteria. The way in which bacteria produce disease has long been a matter of dispute, but the problem appears to be approaching solution. Pathologists have at last turned their attention to the chemical side of the question, and shown that whereas in some cases the poisons produced by the growth of micro-organisms are alkaloidal in nature, in by far the greater number the toxic product is a proteid. The one which is best known, or at least attracted most attention, is the toxalbumose contained in Koch's tuberculin.

The foregoing list is far from complete, but one cannot conclude it without mentioning another class of proteid poisons: these are the nucleo-albumins obtainable by suitable methods from most of the cellular organs of the body. Originally discovered by Wooldridge, they were named by him tissue-fibrinogens, because they possess the remarkable power of producing coagulation of the blood within the blood vessels of a living animal. A very small dose will kill a rabbit or a dog, and death is as a rule produced by extensive clotting within the vessels, especially in the veins. Under certain conditions, however, especially in the dog, they produce the opposite result, namely, a loss of coagulability similar to that produced by peptone. Wooldridge termed this the "negative phase of coagulation."

A practical outcome of all this work is the discovery of alexines or protective proteids. These appear to belong to the nucleo-albumin class also. In small

doses they confer immunity on animals to larger doses of similar poisons, and thus the long-hidden secret of the *modus operandi* of vaccination and other forms of protective inoculation is at last beginning to be unravelled.

A NEW MICROSCOPICAL LABORATORY.

The opening of the new Microscopical Laboratory of the Philadelphia College of Pharmacy marks an epoch in the history of that institution. It means that, hereafter, practical work in the microscopical laboratory will be required in the same measure as practical work in the pharmaceutical and chemical laboratories.

The laboratory is situated on the fourth floor of the College buildings, facing east, and is about forty-five feet square. It is flooded on three sides with light from large windows, and the walls are painted a delicate buff tint.

The room is provided with ten tables, each accommodating ten students, so that one hundred students can be instructed at one time. It can be lighted by electricity, there being four lights to each table. So, if night-work becomes essential, ample light is assured. There are four hundred drawers for holding students' supplies, each of which is provided with a number-combination lock, for which, of course, no key is required.

The surface of each table has been treated with boiling paraffin, making it impervious to corrosive reagents. Lengthwise along the centre of the table is a line of twelve reagent bottles for each student, partially sunken in the counter, and each bottle is provided with a separate glass rod, so that the mixing of reagents is avoided.

For the use of the juniors, one hundred simple microscopes are on hand; for the seniors, there are one hundred compound microscopes. They are of the most approved pattern. A closet is provided for each when not in use. Wall-cases with tin canisters have been set up in which to keep material for work.

On the west side of the room, in the centre, is the lecturer's desk, with a large blackboard for demonstrations in the rear. Alongside is a lead-covered table for the preparation of reagents, maceration of vegetable tissues, etc., with a fume-hood to remove any noxious gases which may be generated.

Each junior student will have one exercise a week through the term, in the study of roots, stems, leaves, flowers, etc., and in the study of crude vegetable drugs. Each senior student will have one exercise a week with the compound microscope, in studying the structure of plants and crude drugs. Special courses for advanced students will be added as the demand for them arises, and as time permits.

The courses are open to all students of botany, whether students in pharmacy or not. The charge is the same to both, namely, \$15 for each course. A deposit to cover breakage is required of each student in the junior course, amounting to 75 cents, and in the senior course to \$2.50.—*Alumni Report.*

* Extracted from an article on "Snake Poison," by Professor W. D. Halliburton, F.R.S., in *Science Progress* for September.

CONTRIBUTIONS TO THE CHEMISTRY OF CERIUM.*

BY W. M. DENNIS AND W. H. MAGER.

(Continued from page 340).

II. QUALITATIVE TESTS FOR CERIUM.

Early in the work the necessity arose for testing various solutions and residues for the presence of traces of cerium, and a comparison of the different methods which have been proposed was made to ascertain which test was most distinctive and delicate.

Until 1864, when Gibbs† proposed his lead dioxide test for ceria, no satisfactory method for the qualitative detection of this earth was known. In 1882 Hartley‡ proposed a more delicate and also a more easily applied test, using ammonium acetate and hydrogen peroxide. In 1885 Lecoq de Boisbaudran,§ and also Cleve,|| observed that hydrogen peroxide gave to solutions of cerium salts, to which an excess of ammonium hydroxide had been added, a precipitate of the same colour as that yielded by Hartley's reagents; namely, an orange-red. Sonnenschein,¶ in 1870, had proposed the use of ceria as a test for strychnine, and Plugge,** in 1891, has reversed this, using strychnine as a test for ceria. Finally, Gibbs,†† in 1894, has proposed to substitute bismuth tetroxide for lead dioxide in his test.

Hartley appears to have been the only observer previous to Plugge to test the delicacy of the reactions proposed. He found that if a quantity of a cerium salt, equivalent to one Mgm. of the element, were dissolved in 100 C.c. of water, the addition of ammonium acetate and hydrogen peroxide gave a distinctly brown or orange-red precipitate which could be filtered off, dried, ignited, and weighed. "Hence we can separate one part of cerium from 100,000 parts of liquid."

To test the delicacy of these various reactions one-half gramme of ceric oxide was dissolved, as sulphate, in a litre of water. Each cubic centimetre of this solution would contain one-half Mgm. of ceric oxide. When one C.c. of this solution was diluted to 100 C.c., and five C.c. of the diluted solution was boiled with excess of lead dioxide and nitric acid (1:2), a faint yellow tint was to be observed, but four C.c. failed to yield a distinguishable colour; that is, 0.025 Mgm. can be detected in about seven or eight C.c. The bismuth tetroxide detected 0.017 Mgm. under the same conditions.

In testing Hartley's reaction, one C.c. containing one-half Mgm. was diluted to 100 C.c., each cubic centimetre then containing 0.005 Mgm. of ceria. When two C.c. of this solution was diluted so much that with the solution of ammonium acetate and hydrogen peroxide it formed about four C.c., a yellow colour was visible, especially on looking downward

into the test-tube held above a white surface; 0.01 Mgm. of ceric oxide, or rather the cerium salt equivalent to this, can, therefore, be detected. Ammonium hydroxide and hydrogen peroxide gave as distinct a colour with one C.c., that is, Boisbaudran's test is twice as delicate as Hartley's.

Next, Plugge's strychnine test was tried and proved to be as delicate as he claims. The strychnine solution is prepared by dissolving one part of strychnine in one thousand parts of sulphuric acid. The solution suspected of containing ceria, or a few cubic centimetres of it, is rendered alkaline by sodium hydroxide, evaporated to dryness, and a drop of the strychnine solution is added. One-tenth of a milligramme of ceria gives a distinct blue or violet colour, changing to red. One hundredth of a milligramme gives a faint blue tinge which rapidly fades. If oxalic acid be present it must be decomposed or the test fails. Boisbaudran's test is then the most delicate of any yet proposed.

Finally, known amounts of lanthana and didymia (mixed) and ceria in solution were mixed and Boisbaudran's test applied. A distinct coloration of the hydroxides was produced when 0.01 Mgm. of ceria was mixed with 0.1 gramme of lanthana and didymia in about 100 C.c. of solution.

To apply the test in the presence of a large excess of other rare earths, very dilute ammonium hydroxide solution should be employed, and this added drop by drop until the first permanent hydroxide remains after shaking. The hydrogen peroxide is then to be added—only a couple of drops are needed—and the mixture well shaken. By this means the weakly basic ceria is precipitated almost alone, and the orange-red colour cannot be disguised.

III. CEROUS CHLORIDE.

The ceric oxide, prepared according to the directions given in the first section, was purified from any thorium present by boiling the oxalate (prepared from the sulphate) with a concentrated solution of ammonium oxalate. Any thorium oxalate dissolved, was poured off and a similar solution poured over the residual cerous oxalate. The whole was then bottled and allowed to stand for some months with occasional shaking. The mixture was then brought to boiling and the liquid again poured off, the residual oxalate being washed with a similar solution. This washed oxalate was then dissolved in nitric acid, care being taken to ensure full decomposition, and it was then almost neutralised with ammonium hydroxide. Potassium hydronitride was then added* so long as it continued to throw down a precipitate. This was filtered off, leaving a solution of cerium nitrate containing only potassium and ammonium salts, with possibly traces of calcium. This solution was precipitated with ammonium hydroxide and washed by decantation until a litre of the wash-water left no residue on evaporation. The ceric hydroxide was then tested for calcium, potassium, etc., with the spectroscope, and proved to be free from all foreign material. This pure hydroxide has been employed to prepare salts of cerium.

* Dennis and Kortright, *Am. Chem. J.*, 16, 79.

* Read before the Rhode Island Section of the American Chemical Society, January 25, 1894. Reprinted from the *Journal of the Chemical Society*.

† *Am. J. Sci.*, [2] 37, 352.

‡ *J. Chem. Soc.*, 41, 202.

§ *Compt. rend.*, 100, 605.

|| *Bull. Soc. Chim.*, [2] 43, 57.

¶ *Ber. d. chem.*, Ges., 3, 531.

** *Arch. d. Pharm.*, 229, 558.

†† *Am. Chem. J.*, 15, 546.

As this work has been in reality only preliminary to an extended study of cerium, many of the already known salts were prepared in order to become familiar with their characteristics, but of these there is no need to speak at length.

A salt, which may probably be rightly claimed to be a new compound, was prepared while endeavouring to obtain cerium tetrachloride. This latter should be capable of existence if cerium is properly placed in the periodic system. Every other element in group IV of that system forms such a chloride, not even excepting lead.* Among other attempts made, one was as follows: A concentrated solution of cerous chloride, obtained by dissolving ceric chloride in hydrochloric acid and evaporating, was placed in a wash-bottle surrounded by a freezing mixture (snow and salt), and dry chlorine gas run in. This was rapidly absorbed, and after a short time a white crystalline mass settled out. This was placed on a porous porcelain plate to remove the greater part of the liquid, and then the following experiments were tried with different portions:—

An attempt was at first made to dry it to constant weight over dry caustic potash in vacuo. A large, but irregular, loss of weight occurred and the crystals evidently effloresced. On exposing it to the open air again it gained in weight till almost as heavy as at first.

An attempt to dry it over calcium chloride gave a similar result. A portion was then dried in air, dust being excluded.

	Grammes.
Weight of sample taken	2.9824
" " " after 72 hours	2.9801
" " " " 118 "	2.9790
" " " " 142 "	2.9786
" " " " 166 "	2.9786

The chloride therefore assumes a constant weight in air.

In analysing this air-dried chloride the cerium was first precipitated from the aqueous solution of the salt by ammonium hydroxide. The precipitate was so gelatinous that it was difficult to wash it free from chlorides, and the oxide obtained by ignition of the precipitate was not of a pure yellow colour. The percentages of cerium obtained in two analyses were 38.01 and 38.19.

In two other samples the cerium was thrown down by ammonium hydroxide and hydrogen peroxide was added. The orange-coloured hydroxide thus formed was not as gelatinous as that formed with ammonia alone, and was much more easily washed, but on ignition of the precipitate the resulting ceric oxide was of a pale pink colour. This colour may have been due to the presence of a small amount of a higher oxide, for the results—38.01 and 37.93 per cent. cerium—while not agreeing as well as could be wished, were too high (see analysis below). The chlorine was determined by precipitation as silver chloride, and the water by the method suggested by Kraut.†

	Calculated for $\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$.	Found.
Ce	37.63	37.97
Cl	28.54	28.58
H_2O	33.83	33.88

The above analysis showed that the compound formed by passing chlorine into a cold saturated solution of cerous chloride was merely a finely crystalline form of cerous chloride, and not a ceric chloride. Inasmuch then as the formation of the compound was probably due not to the oxidizing action of the chlorine, but to its dehydrating power, it seemed reasonable to expect that dry hydrochloric acid gas would accomplish the same result. The hydrochloric acid gas was made by the action of concentrated sulphuric acid upon solid ammonium chloride, the apparatus of Norblad being used for this purpose. Upon passing the gas into a cold concentrated solution of cerous chloride, the same white finely crystalline compound separated as with the chlorine. This was dried in the air to constant weight and then analysed. In determining the cerium, the orange-coloured hydroxide was precipitated by ammonium hydroxide and hydrogen peroxide but, before filtering, the solution was heated just to boiling. The suspended hydroxide changed to a bright yellow colour, but it did not become gelatinous, and was easily washed. On ignition it yielded a ceric oxide of the usual pale yellow colour.

	Calculated for $\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$.		Found.
Ce	37.63	37.70	37.71
Cl	28.54	28.41	28.45
H_2O	33.83	by diff. 33.89	33.94

The crystalline form of the chloride was kindly determined by Mr. A. S. Eakle, of the Geological Department of the University, who states that "the cerous chloride is orthorhombic in crystallisation."

The above chloride seems to be distinct from that obtained by Jolin* and by Lange,† for which the formula $2\text{CeCl}_3 \cdot 15\text{H}_2\text{O}$ is generally given.‡ The chloride may be made by dissolving ceric hydroxide in hydrochloric acid and evaporating on the water-bath until the solution becomes quite viscous. This solution placed in a desiccator while hot solidifies on cooling to a crystalline mass of a yellow colour. If these crystals be allowed to stand in the air they lose their colour, and a glassy coating appears to form over the surface. The differences between the results obtained by Jolin and by Lange, and the variation of each of their analyses from the calculated percentages, made it seem desirable to repeat the analysis of chloride prepared by Jolin's method to see if better results could not be obtained. A sample of their chloride was therefore prepared by us and analysed, but the results showed as great a variation from the theory as those already mentioned.

	Calculated for $2\text{CeCl}_3 \cdot 15\text{H}_2\text{O}$.	Jolin.	Lange.	Magee.	Calculated for $\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$.
Ce	36.74	36.89	37.37	36.37	37.63
Cl	27.87	28.40	28.80	28.65	28.54
H_2O	35.39				33.83

(To be continued).

* *Monatsh. f. Chem.*, 14, 506.

† *Ztschr. anal. Chem.*, 2, 242.

* *Bull. Soc. Chim.*, [2] 21, 153.

† *J. prakt. Chem.*, 82, 129.

‡ *Gmelin-Kraut, Dammer and others.*

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, NOVEMBER 10, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the Editor, 17, Bloomsbury Square, London, W.C.

Correspondent Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brembridge, 17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

THE business transacted by the Council at the meeting last Wednesday was for the most part of a routine nature. The reports of the several committees did not raise any questions for discussion, and were unanimously adopted.

In connection with matters of finance the PRESIDENT mentioned that though the balance in hand to the credit of the Benevolent Fund, amounting to £547, might seem large, there will be heavy calls in January, for meeting which more will be required.

On the recommendation of the Benevolent Fund Committee, one grant of twenty pounds, one of thirteen pounds, and three grants of ten pounds each were ordered to be paid.

In connection with the annuities the TREASURER expressed regret that the number of annuitants to be elected in December could not be extended from four to seven. The VICE-PRESIDENT, in reply said that this feeling of regret was shared by the Committee, but under existing circumstances it did not feel justified in putting extra burdens upon the Fund.

In reference to the recent death of Mr. EDWARD HORNER, it was resolved, on the motion of the PRESIDENT, that a letter of condolence should be sent to his widow on behalf of the Council. Besides occupying a prominent position in the wholesale trade and in other capacities in the city, Mr. HORNER was one of the founders of the Society, and for some years acted as one of the auditors. Our readers will remember that Mr. HORNER was present at the jubilee dinner of the Society in 1890, and was on that occasion the last surviving founder. The omission to refer to his death at the last meeting of Council was due to some uncertainty as to

whether the announcement which appeared in the papers related to the old friend and founder of the Society.

After the formal appointment of local secretaries for the ensuing year, it was resolved that superintendents of written examinations should be appointed at the same centres as last year, and that these appointments should be offered to the local secretaries at those centres. The appointment of assistant local secretaries was deferred until next month, until the names of those chosen by the local secretaries had, as their assistants, been submitted to the Council for approval.

A report was presented stating the centres at which Preliminary examinations have been held during the past year, with the number of candidates at each, and it was ordered to be entered upon the minutes (see page 386).

A resolution was passed that the meetings of the Boards of Examiners, in 1895 and 1896, should take place in January, April, July, and October.

At the suggestion of the founder of the Manchester Scholarship, and on the recommendation of the General Purposes Committee, it was resolved that the first three books of Caesar's Commentaries shall be added to the subjects for examination for this scholarship, as alternative to the first three books of the *Æneid*.

In reference to the opening of the new premises in Edinburgh on the 30th inst., it was resolved that a conversazione is to be held at the Society's house in Edinburgh on that occasion, and that the Executive of the North British Branch be authorised to take the requisite steps by issuing invitations in the name of the PRESIDENT, Vice-President and Council of the Society.

The resolution adopted by the Chemists' Assistants' Association as to the provision of a course of post graduate lectures and laboratory demonstrations during the coming winter and submitted to the Council was referred to the Library, etc., Committee for consideration.

The portion of the General Purposes Committee relating to legal proceedings stated that many penalties had been paid without trial, some judgments have been obtained, and other cases are awaiting trial. Proceedings were ordered to be taken in several other cases which have been reported to the Committee.

EVENING MEETING IN LONDON.

Professor REYNOLDS GREEN, M.A., Sc.D., will give an illustrated lecture on "The Nervous System in the Vegetable World" at the evening meeting of the Pharmaceutical Society on Wednesday next, November 14. The President, Mr. MICHAEL CARTEIGHE, will take the chair at eight o'clock prompt.

PREVENTIVE MEDICINE.

THE diphtheria antitoxin is still on its trial, but the trial has been adjourned *sine die* by the failure of the supply of material. The public are thus left with breathing-time in which they may inform themselves of the nature and scope of the latest project of scientific medicine, and pharmacists are given leisure in which they may learn the mode of preparation of the new claimant to a place in the *materia medica*. The public are almost as cautious as the scientists in forming their opinions in the present instance. Pity it was not the same in the case of the potent, but, alas! not remedial tuberculin!

After the bacillus of diphtheria was first discovered by LOEFFLER much circumspection was displayed before it was admitted to be the cause of the disease. It was found to be constantly present on the surface, that is in the oldest parts, of diphtheritic membrane. Later, ROUX and YERSIN found that certain animals when inoculated with pure cultures of the bacillus contracted an affection presenting all the peculiarities of diphtheria in man: false membranes, intense inflammation, and in many cases the peculiar diphtheritic paralysis. Thus the micro-organism satisfies all KOCH's postulates, and must be regarded as the *causa vera* of the disease. The bacillus is always accompanied by multitudes of streptococci, which, by the toxins they produce, doubtless assist in producing the phenomena of the disease. The next step in the evolution of the antitoxin was a discovery made by ROUX and YERSIN. These observers found that old and strongly alkaline cultures of the bacilli in broth, freed from the micro-organisms by filtration, possessed highly poisonous characters. The filtrate when injected beneath the skin of guinea-pigs, pigeons, etc., caused intense inflammation and diphtheritic paralysis. Such filtrates evaporated in vacuo at a temperature of 40° C. to one-third of their bulk, and dropped into absolute alcohol acidified with acetic acid, yield a flaky grey precipitate which is readily soluble in water, and can be purified by re-precipitation and dialysis. Thus is obtained a white powder which gives the chief reactions of an albumin and possesses the same poisonous properties as the original filtrate. The purified product is thus a typical "toxalbumin."

In 1889 ROUX, speaking to the Royal Society, was able to formulate a further advance in knowledge, thus:—"The immunity which we could only give by the introduction of a living virus we can now effect by the introduction of a chemical substance into the tissues, and these vaccine substances are exactly those which have been observed in infectious diseases as being the cause of death. In large quantities they kill, in small they confer immunity." The next important step

towards the present position was made by BEHRING and KITASATO, who found, in 1890, that the blood of animals which had been rendered refractory to tetanus by the method just referred to was capable of destroying the poison of tetanus both in test-tubes and after injection in rabbits and mice suffering from the disease. This important property of the blood of animals rendered proof against tetanus was found to hold good of many other affections, including diphtheria, and even for snake-poison. It is not known how the serum acts on the toxalbumin of diphtheria, but it is surmised that a substance is formed by the cells of the immunised animal which is capable of destroying the poison. This substance is the "antitoxin." Whether the antitoxin acts directly by a chemical reaction, or indirectly through the cells of the body is not settled definitely. But the latter hypothesis is the more probable, since the amount of antitoxin required to immunise animals of different species varies even when the animals are of the same weight. This hypothesis has also the support of an observation made by F. KLEMPERER, who found that the yolk of the egg of an immunised hen was anti-toxic, whilst the white of the same egg was not. We have in a former article (October 13, 1899) sketched the mode of preparation of the antitoxin serum, and are glad to know that a fresh supply is being prepared at the Institute of Preventive Medicine in London. This will enable fuller statistics to be provided on which a final judgment may be pronounced. For the purpose of statistics it will be better to exclude all cases except those in which the bacillus of diphtheria has been found by cultivation.

THE NEW JOURNALISM.

IN the Journal for October 13 last an article on "Higher Education for the Pharmacist," by Professor JOHN M. FRANCIS, was reprinted from the *Pacific Druggist*, and duly acknowledged as having been taken from that source, where it was published as original matter. We now find, however, that the article originally appeared in the *Bulletin of Pharmacy*, in which paper it was specially prepared by the author, and we desire to express regret for inadvertently giving credit where not due. Such venial errors are at times unavoidable in the face of the peculiar system followed by many editors, who seem to prefer to take responsibilities they have not incurred rather than quote the source of their "original" articles, translations, and abstracts. In pharmaceutical journalism we are probably the greatest sufferers by this practice, which is indulged in much too freely by some of our transatlantic contemporaries. Whilst only too pleased to find our subject-matter regarded as of sufficient importance to be worthy of more or less extensive reproduction, we venture to submit that it is not too much to expect

proper acknowledgment to be made in every instance. In such cases as the one which has given occasion for the publication of this note, apologies are due to those who are misled by the omission to furnish such acknowledgment, no less than to the original publisher of the information. It may occasionally happen, in the pressure of business, that the omission is purely inadvertent, but it is sufficient, to say the least, to see that journals claiming reputation persistently and continually ignore the most elementary notions of courtesy and honesty.

ADVICE TO STUDENTS.

It has been a frequent cause of complaint that a numerous instances youths had entered upon the practice of pharmacy, as apprentices, whilst possessing but the haziest notions as to what would be required of them before they could become registered as chemists and druggists. More than this, their parents or guardians, and sometimes, unfortunately, even those to whom they were apprenticed, have been unable or disinclined to afford them enlightenment. To the end that more definite ideas should prevail, and every apprentice have the opportunity of ascertaining what are the essential requirements before it becomes too late to change his vocation should he feel himself unqualified to proceed on his chosen path, special articles were published in the "Students' Number" of the Journal, for the 15th September last. These articles have now been reprinted by the Council of the Pharmaceutical Society in pamphlet form, together with information of interest to pharmaceutical students regarding the scholarships, prizes, examinations, etc., and copies of this "Advice to Students" may be obtained by those interested on application to the Registrar, 17, Bloomsbury square, London, W.C.

NEW HALL AND LABORATORIES IN EDINBURGH.

A MEETING was held at the Pharmaceutical Society's house in Edinburgh on Thursday, the 5th ult., to consider arrangements in connection with the forthcoming opening of the new premises, and it was resolved that on the evening preceding the opening there should be a dinner at the Royal Hotel, at which the PRESIDENT, Vice-President, and Secretary of the Society, with other guests, should be entertained. A small committee was appointed to carry out the arrangements, and it was agreed that the chair should be taken on that occasion by Mr. J. LAIDLAW EWING, with Mr. CHARLES KEER, of Dundee, and Mr. W. L. CURRIE, of Glasgow, as Vice-Chairmen. Particulars will be found in our advertisement columns, page v. At the Council meeting on Wednesday, the PRESIDENT mentioned that invitations to be present at the dinner had been sent to the members of Council. In complimenting the Committee of the Executive, which has worked so zealously in carrying out the new buildings, the PRESIDENT said he hoped they might reflect credit upon Edinburgh, and be the means of advancing the cause which Scottish pharmacists and the Council have equally at heart.

CONVERSAZIONE IN EDINBURGH.

WE understand that the new premises connected with the Pharmaceutical Society's house in Edinburgh will be completed very shortly, and that the

formal opening of them will take place on the 30th of this month. The new buildings comprise a spacious examination hall and two other rooms, which are to be used for the examinations in chemistry and practical pharmacy. A full description will appear in the Journal at the time of the opening. On that occasion there will be a *conversazione* (see advt., p. v.), at which the PRESIDENT, Vice-President, and Council of the Society request the honour of the company of members, associates, and students of the Society, and at the Council Meeting the PRESIDENT expressed a hope that as many of the members of Council as could conveniently do so would attend the reception.

NOTES.

The opening meeting of the School of Pharmacy Students' Association will be held on Thursday, November 15, at 7 p.m., when the introductory address will be given on the occasion by Mr. ROBERT HAMPSON, Treasurer of the Pharmaceutical Society.

THE annual *conversazione* in connection with the Chemists' Assistants' Association will be held at the Portman Rooms, Baker Street, on Thursday, 15th inst., commencing at 8 p.m. There will be an exhibition of electric, photographic, and microscopic appliances, followed at 9 p.m. by a concert, and at 10.15 by dancing.

WE report a conviction at Dumfries, under the Sale of Food and Drugs Act, for the sale of simple carbonated water as soda or potash water (p. 390). This is understood to be a test case, proceedings having been instituted against several individuals.

THE additions to the Owens College Medical School, Manchester, formally opened on Tuesday last by the Duke of Devonshire, include two large lecture theatres with accommodation for 350 and 250 students respectively; laboratories for practical and chemical physiology, histology, pathology and pathological chemistry, bacteriology, toxicology, etc.; a research laboratory; galvanometer, optical, photographic, and other rooms for special purposes.

THE Liverpool Chemists' Association held a meeting, on the 28th ult., to discuss certain B.P. remedies, the report of which has only now reached us. Unfortunately the notes sent of Mr. COWLEY's paper were too fragmentary to be of much practical use, but the abstract given at page 389 fairly represents as much of them as was intelligible.

ALDERMAN W. GOWEN CROSS, of Shrewsbury, Vice-President of the Pharmaceutical Society, having been selected to fill the office of Mayor of that borough for the ensuing year, his name would be submitted on Friday, November 9, for election in the ordinary course.

MR. H. BARTLETT, of Banbury, local secretary to the Pharmaceutical Society, has again been returned a member of the local corporation in the Conservative interest.

OWING to pressure on our space we are compelled to defer the publication of several notes.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, November 7, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Gostling, Greenish, Grose, Hampson, Hills, Martin, Martindale, Newsholme, Richardson, Schacht, and Young.

The minutes of the previous meeting were read and confirmed.

ELECTION OF MEMBERS.

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Burrows, Harry Southgate.
Davies, Herbert Paget Cheltenham.
Gillett, Francis John Fairfield.
King, Charles Edward Berkhamsted.

ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered (or paid as Students) their subscriptions for the current year, were elected "Associates" of the Society:—

Amias, Albert Edward London.
Angel, Edward Charles London.
Appleyard, Percy Keighley.
Ault, Percy Mansfield.
Brack, David George South Shields.
Bryant, Nicholas J. Andrew Truro.
Charlesworth, Chas. Edward Manchester.
Cleghorn, James London.
Coward, Miles Kewwick.
Gibson, George Shaw West Hartlepool.
Gilmour, William, jun. Edinburgh.
Jenkins, Morris William St. Clears.
Jones, William Miall Aberystwith.
Marshall, John George Alfreton.
Massey, Cecil Spalding.
Mirtles, Arthur Houldsworth Laaswade.
Mitchell, Henry Searle Truro.
Morrey, George Market Drayton.
Moultrie, George Briggs Eastleigh.
Neathercoat, Harry William Ely.
Pendlebury, James Manchester.
Potter, Henry Arthur Peckham.
Rist, William King Southampton.
Scrubby, John Charles London.
Smith, Charles Llandudno.
Stratton, William George Uckfield.
Swaffin, John Phillips Dartmouth.
Taylor, Charles John Sandgate.
Thomas, Hugh William Carnarvon.
Thomas, John Oliver London.
Tutt, George Francis Ashford.
Wardley, Thomas Dalton-in-Furness.
Watson, David Glasgow.
Webb, Joseph John London.
White, Henry Fox Clifton.
Williams, David Isaac Llanwrtyd Wells.
Williams, John Bagillt.
Woodliffe, Henry Grayson Bridlington.

ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Moore, Thomas Henry Grimsby.
Skinner, Arthur Edward London.
Wilson, Robert William Sunderland.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

RESTORATIONS TO THE REGISTER.

The names of the following persons were restored to the Register of Chemists and Druggists:—

Alfred Boyce, Lyndhurst House, Worthing.
William George Duck, 12, St. John Square, Cardiff.
Frederick Gibson, The Mount, Fleetwood.
George Johnson, Sutton Coldfield.

REPORT OF FINANCE COMMITTEE.

The report of this Committee was of the usual character, and recommended the payment of sundry accounts.

The PRESIDENT (as Chairman of the Committee), in moving the adoption of the report and recommendations, said there was nothing special to call attention to, either as regards the receipts or payments. The balance in hand to the credit of the Benevolent Fund was £547, which might seem relatively large, but a great deal more than that would be required to pay the annuitants in January, and the grants to be made in the meanwhile. No addition had been made to either the Donation account or Orphan Fund account.

The motion was unanimously agreed to.

REPORT OF BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to the widow (64) of a member, who has had seven previous grants amounting to £80. (Cosham, Hants).

£10 to a registered chemist and druggist (61) partially crippled, and unable to stand for long at a time. (Goole).

£13 to the widow (61) of a registered chemist and druggist suffering from chronic ulceration of the leg. She has had nine previous grants amounting to £73. (Crewe).

£10 to a registered chemist and druggist (71), who had a grant of £10 in October, 1893. He has a wife (61) to support, and an invalid daughter with three children lives with him, her husband having lost all his property, and being now out of employment. (London).

£20 to a member, who was for many years a local secretary. He had to assign everything for the benefit of his creditors. He is badly ruptured and quite unable to work. (Barry).

Three other cases were deferred for further consideration, and one was not entertained.

The VICE-PRESIDENT, without comment, moved the reception and adoption of the report.

Mr. HAMPSON said he much regretted that he had not been supported in his suggestion to the Committee that seven annuitants should be elected next month instead of four, seeing that since the Committee made its recommendation three annuitants had passed away. He wished it could have been done, as it would save a great deal of trouble and expense to the candidates.

The VICE-PRESIDENT said it was hardly necessary to make any reply to his friend, Mr. Hampson, beyond saying that the question was settled last month. The Committee did not feel justified, looking at the

state of the Fund, in throwing any extra burden upon it. They would all have been glad if they could have elected seven, or even more.

The PRESIDENT said it might be hoped that there would be better prospects next time.

The motion was then agreed to.

VOTE OF CONDOLENCE.

The PRESIDENT apologised to the Council for not having at the last meeting referred to the death of one of the founders of the Society, and a gentleman very well known in its early history, who was also personally known to himself (the President) when, some thirty years ago, as an auditor, he performed one of the first of his services to the Society. He referred to Mr. Edward Horner, the announcement of whose death he saw in the papers, but for the moment was not sure that it referred to their old friend and founder, as he had since ascertained was the case. Mr. Horner was one of those men whose superior education and sterling common-sense marked him in the city as being a really important—he had almost said a great—man in connection with large public works, gas companies, water companies, and the like. In respect to these his advice was constantly sought, and for a number of years he was chairman of what, if his memory served him aright, was the old Phoenix Gas Company, whose offices in his (the President's) early days were near Blackfriars Bridge. He died at a patriarchal age, leaving a large family, and possessed robust health throughout his life, partly, perhaps, attributable to his habit of living always in the country and not in the city where his work was concentrated, and the result seemed to have justified the mode of living. Many might remember him as present at their jubilee dinner, where as the only representative of the founders of the Society he made the last speech probably that he delivered in public in connection with the Society. He had thought it his duty thus to refer to their friend's passing away in order to show that they had not lost their respect for the man and his character. He proposed that a letter of condolence be sent to his widow.

The VICE-CHAIRMAN said he would second that, and on its being put it was carried unanimously.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
July . . .	Day . . .	394	23	3	15
	Evening . . .	99	11	1	5
August . . .	Day . . .	91.	7	0	4
September . . .	Day . . .	90	13	3	7

	Circulation of Books.	Total.	Town.	Country.	Carriage paid.
July	177	97	80	19s.	10½d.
August	131	58	73	17s.	10½d.
September	125	49	76	18s.	7½d.

Donations to the Library had been announced (*Pharm. Journ.*, October 13, p. 299), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that Gould's *Illustrated Dictionary of Medicine, Biology, and Allied sciences*, be purchased.

The Librarian had reported that the undermentioned works were missing at the annual revision:—

Fowler's "Medical Vocabulary."

Squire's "Methods and Formulae."

The Librarian had presented a report on the annual meeting of the Library Association, held at Belfast.

Museum.

The Curator's report had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
July	Morning	462	35	1	18
	Evening	51	7	1	2

Donations to the Museum had been announced (*Pharm. Journ.*, October 20, p. 319), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

Applications for specimens had been received from Professor Johnson, of the Science and Art Museum, and from Dr. Duffy, Professor of Materia Medica at the College of Surgeons' Museum at Dublin.

A set of dried specimens of indigenous medicinal plants had been forwarded to the Three Towns and District Association at Plymouth, and a letter of thanks had been received from the Secretary of the Association.

Duplicate specimens of drugs had been forwarded to the Colonial Museum at Haarlem.

The Committee recommended that the pamphlet, "Advice to Students," containing educational matter reprinted from the Journal, be printed for use in the Secretary's office after revision by the President.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. He said the business at the last meeting was of a purely formal character, and he need not detain the Council by any remarks upon it. The little pamphlet referred to was designed to take the place of the "Hints to Students," written originally by Jacob Bell.

LOCAL SECRETARIES.*

The PRESIDENT said this was the month in which it was usual to appoint local secretaries, and the list having been gone through in the usual way, he moved the appointment of the following gentlemen, which was carried:—

District.	Local Secretary.
Aberdeen	Strachan, Alexander.
Aberystwith	Wynne, Edward P.
Abingdon	Smith, William F.
Airdrie	Harvie, John.
Altrincham	Foden, Joel.
Andover	Bienvenu, John.
Arbroath	Robertson, John.
Ashbourne	Bradley, Edwin S.
Ashford	Ingall, Joseph.
Ashton-under-Lyne	Bostock, John W.
Aylesbury	Palmer, Edwin T.
Ayr	McGregor, Adam.
Banbury	Bartlett, Hubert.
Banff	Alexander, William.
Bangor	Jones, Owen.
Barking	Ridley, Charles H.
Barnet	Young, R. Fisher.
Barnsley	Eastwood, Lewis.
Barnstaple	Goss, Samuel.
Barrow-in-Furness	Chapman, Leonard P.
Bath	Appleby, Edward J.
Bedford	Taylor, James B.
Belper	Calvert, James.

* Local Secretaries are appointed in all towns in Great Britain (except London and Edinburgh) which return a Member or Members to Parliament, and in such other towns as contain not less than three Members of the Society or Associates in Business.

District.	Local Secretary.
Berwick.....	Lyle, William.
Beverly.....	Hoatson, Charles.
Birkenhead.....	Brookes, Alfred Fincher.
Birmingham.....	Thompson, Charles.
Bishop Auckland.....	Dobinson, Thomas.
Blackburn.....	Critchley, Thomas.
Blackpool.....	Laurie, John.
Blandford.....	Groves, Richard H.
Bodmin.....	Cardell, Richard T.
Bolton.....	Blain, William R.
Boston.....	Grimble, Albert.
Bournemouth.....	Toone, John A.
Bradford (Yorkshire).....	Remington, George.
Brecon.....	Meredith, John.
Brentford.....	Wood, Alexander.
Bridgnorth.....	Deighton, Thomas Milner.
Bridgwater.....	Basker, John Anthony.
Bridlington.....	Purvis, John B.
Brighton.....	Gwatkin, James Ross.
Bristol.....	Stroud, John.
Burnley.....	Cowgill, Brian H.
Burslem.....	Hewitt, Joseph F.
Burton-on-Trent.....	Wright, George.
Bury St. Edmunds.....	Clark, Owen A.
Buxton.....	Wright, Robert.
Camborne.....	Tonking, Charles H.
Cambridge.....	Deck, Arthur.
Canterbury.....	Bing, Edwin.
Cardiff.....	Munday, John.
Carlisle.....	Hallaway, John.
Carmarthen.....	Lloyd, Walter.
Carnarvon.....	Jones, John.
Castle Douglas.....	Veitch, Andrew.
Chatham.....	Morgan, Alfred William.
Chelmsford.....	Metcalfe, Wilson.
Cheltenham.....	Barron, William.
Chester.....	Shepherd, William F. J.
Chesterfield.....	Windle, John T.
Chichester.....	Long, William Elliott.
Chippenham.....	Coles, John Coles.
Chorley.....	Hill, William.
Cockermouth.....	Scott, Walter S.
Colchester.....	Cordley, William Bains.
Coldstream.....	Elliot, William M.
Coventry.....	Hinds, James.
Crewe.....	Mason, Edgar.
Cromer.....	Hoare, William Parker.
Croydon.....	Clarke, Josiah.
Dalkeith.....	Storie, Robert.
Darlington.....	Robinson, James.
Dartford.....	Goff, Walter E.
Darwen.....	Shorrook, Ralph.
Deal.....	Green, John.
Derby.....	Cope, John A.
Devizes.....	Edwards, Thos. Roberts.
Devonport.....	Rendle, Richard H.
Dolgelly.....	Williams, Richard Wynne.
Doncaster.....	Howorth, James.
Douglas (Isle of Man).....	Radclyffe, John C.
Dover.....	Bottle, Alexander.
Droitwich.....	Harris, Stephen.
Dudley.....	Gare, Charles Hazard.
Dumfries.....	Allan, William.
Dundee.....	Hardie, James.
Dunfermline.....	Seath, Alexander.
Duns.....	Gunn, William.
Durham.....	Sarsfield, William.
Ealing.....	Curtis, Frederic G.
Eastbourne.....	Crook, Herbert.
Eccles.....	Howie, William Lamond.
Egremont (Cumberland).....	Ireland, Edward J.
Elgin.....	Robertson, William.
Enfield.....	Gange, George.
Epping.....	Rowland, Thomas W.
Exeter.....	Lake, John Hinton.

District.	Local Secretary.
Falkirk.....	Murdoch, David.
Falmouth.....	Newman, Walter Francis.
Faversham.....	Laxon, Matthew.
Finchley.....	Freeman, Frederick Wm.
Flint.....	Jones, Owen Williams.
Folkestone.....	Lea, Frederick James.
Forfar.....	Fowler, George R.
Frome.....	Green, Edmund C. F.
Gainsborough.....	Surfleet, Arthur George.
Galashiels.....	Ross, William.
Gateshead.....	Maillard, Ralph W.
Glasgow.....	Currie, William L.
Gloucester.....	Slinn, Harry E.
Goole.....	Timm, Edmund.
Grantham.....	Whysall, William.
Gravesend.....	Clarke, R. Feaver.
Great Grimsby.....	Cook, Robert.
Greenock.....	McNaught, Archibald.
Guernsey.....	Nickolls, John B.
Guildford.....	Long, Alexander J. T.
Haddington.....	Watt, James.
Halifax.....	Seely, Herbert W.
Hanley.....	Cornwell, Thomas C.
Harrogate.....	Davis, R. Hayton.
Harrow.....	Gunn, Samuel John.
Harwich.....	Worts, Augustine.
Hastings and St. Leonards.....	Tharle, Charles A.
Hawick.....	Maben, Thomas.
Helensburgh.....	Harvie, George.
Hendon.....	Goldfinch, George.
Henley-on-Thames.....	Batchelor, Charles J. H.
Hereford.....	Williams, Walter.
Hertford.....	Lines, George.
Hexham.....	Gibson, John Pattison
Hitchin.....	Ransom, William.
Honiton.....	Dyer, Edward H.
Horncastle.....	Kemp, Herbert W.
Hornsea.....	Morrow, Charles.
Houghton-le-Spring.....	Rowell, Robert H.
Huddersfield.....	King, William.
Hull.....	Bell, Charles Bains.
Huntingdon.....	Baxter, Robert.
Huntly.....	Chalmers, George.
Hyde.....	Wild, Joseph.
Hythe.....	Lemmon, Robert Alce.
Ilfracombe.....	Crang, Walter.
Ilkley.....	Worfolk, George W.
Inverness.....	McRitchie, David.
Ipswich.....	Anness, Samuel Richard.
Jersey.....	Cole, George.
Keighley.....	Kershaw, Arthur N.
Keith.....	Pirie, James.
Kendal.....	Severs, Joseph.
Kilmarnock.....	Borland, John.
King's Lynn.....	Palmer, William J.
Kingston-on-Thames.....	Walmsley, Samuel.
Kinross.....	Dow, William.
Kintore.....	Keith, Alfred G.
Kirkcaldy.....	Storarr, David.
Kirkwall (Orkney).....	Stewart, Duncan.
Knaresborough.....	Lawrence, William P.
Knutsford.....	Silvester, Henry T.
Lancaster.....	Vince, James.
Leamington.....	Barrett, Josephus T.
Leeds.....	Reynolds, Richard.
Leicester.....	Clark, Walter Beales.
Leigh (Lancs.).....	Bennett, John William.
Leighton Buzzard.....	Richmond, Robert.
Leith.....	Garvie, Alexander.
Leominster.....	Sandiland, Robert B., Junr.
Lewes.....	Higham, Thomas.
Leytonstone.....	Bennett, Cornelius.
Lichfield.....	Perkins, John Jaquest.
Lincoln.....	Birkbeck, John Thomas.
Liverpool.....	Smith, John.

District.	Local Secretary.
Llandudno	Winter, Joseph.
Llanrwst	Jones, Owen.
Longton	Prince, Roland.
Loughborough	Charles, Wm. Frederick.
Louth	Dennis, Fred Woodrow.
Lowestoft	Clarke, Geo. Ernest.
Ludlow	Woodhouse, George.
Luton	Duberley, George S.
Maidenhead	Walton, Ralph.
Maidstone	Stonham, William B.
Maldon	Crick, George E.
Malton	Buckle, James.
Malvern	Mander, Alfred.
Manchester, etc.	Kemp, Harry.
Mansfield	Patterson, Douglas J.
March	Davies, Peter Hughes.
Margate	Harvey, William Sutton.
Market Harborough ..	Maynard, Henry R.
Melton Mowbray	Wing, Geo. N.
Merthyr Tydvil	Smyth, Walter.
Middlesborough	Robson, J. Crosby.
Middleton (Lancs.) ..	Parker, James H.
Montrose	Davidson, Alexander.
Morecambe	Kell, John James.
Morpeth	Schofield, Fredk. E.
Newark	Cherrington, Geo. W.
Newcastle-on-Tyne ..	Clague, Thomas M.
Newcastle-under-Lyme	Poole, Weston.
Newmarket	Barrow, Frank Arthur.
Newport (Mon.)	Garrett, Thomas P.
Newton Abbot	Bibbings, John Henry.
Newtown	Owen, Edward.
Northampton	Bingley, John.
Northwich	Humphreys, Griffith.
Norwich	Sutton, Francis.
Norwood	Birch, Henry C.
Nottingham	Bolton, Charles A.
Nuneaton	Iliffe, George.
Oakham	Wellington, James.
Oban	Robertson, Alexander.
Oldham	Bates, Henry.
Oswestry	Evans, John.
Otley	Lockwood, Thomas.
Oxford	Prior, George Thomas.
Paisley	MacCowan, Robert Thos.
Peebles	Lindsay, Robert.
Penrith	Cowper, Joseph.
Penzance	Shakerley, Benjamin.
Perth	Donald, David.
Peterborough	Heanley, Marshall.
Peterhead	Tocher, James F.
Petersfield	Edgeler, William B.
Plymouth	Hunt, Freeman W.
Pontefract	Bratley, William.
Pontypridd	Arnott, Daniel.
Portobello	Allan, David (Musselburgh)
Portsmouth, etc.	Brewis, Thomas.
Preston	Stuart, William.
Prestwich	Mercer, Allan.
Ramsey (Hunts)	Palmer, Frederick Wm.
Ramsgate	Baily, Edward.
Reading	Bradley, Charles.
Reigate	Woodward, Moses M.
Rhyl	Lawrence, Geo. Richard.
Richmond (Surrey) ..	Thacker, William.
Richmond (Yorks) ..	Walton, E. Bridges.
Ripon	Parkin, Joseph Brooks.
Rochdale	Higbley, William.
Rochester	Wyatt, Charles Frederick.
Romford	Lasham, John William.
Ross	Matthews, Thomas A.
Rothessay	Duncan, William.
Rugby	Brown, Frederick P.
Runcorn	Weston, John H.
Ruthin	Rouw, Theodore J.

District.	Local Secretary.
Ryde	Pollard, Henry Hindes.
Rye	Waters, William Allen.
Saffron Walden	Gilling, John.
St. Albans	Ekins, Arthur, E.
St. Andrews	Kermath, William R.
St. Austell	Binks, Burcham.
St. Helens	Wallbridge, John George.
Salisbury	Atkins, William Ralph.
Scarborough	Whitfield, George.
Sevenoaks	Pain, Edwin.
Sheffield	Ward, William.
Shipley	Dunn, Henry.
Shrewsbury	Cross, William Gowen.
Slough	Griffith, Richard.
Southampton	Dawson, Oliver R.
Southend-on-Sea	Dawson, George R.
South Molton	Swingburn, Richd. Hy.
Southport	Righton, James.
South Shields	Noble, John.
Spalding	Bell, E. Wightman.
Stafford	Averill, John.
Stalybridge	Simpson, Allwood.
Stirling	Sharp, William.
Stockport	Orton, Wm. Billing.
Stockton-on-Tees	Brayshaw, Thomas.
Stoke-on-Trent	Adams, Frank.
Stone, Staffs.	Jacks, Frederick.
Stonehouse (Devon) ..	Maitland, Frank.
Stourbridge	Selleck, William R.
Stowmarket	Gostling, George James.
Stranraer	Ker, Richard.
Stratford	Holford, Thomas C.
Stratford-on-Avon ..	Hawkes, Richard.
Streatham	Shacklock, James H.
Stroud	Coley, Samuel James.
Sunderland	Ranken, Charles.
Swaffham	Bell, Frederick R.
Swansea	Grose, Nicholas M.
Sydenham	Wilson, Alexander W.
Tain	Fowler, Donald.
Tamworth	Allkins, Thomas Boulton.
Tavistock	Gill, William.
Teddington	Stacey, Peter.
Teignmouth	Maunder, William.
Tiverton	Havill, Paul W.
Torquay	Shapley, Charles.
Totnes	Morse, Charles H. S.
Tottenham	Tanner, Alfred E.
Treherbert	Richards, Thomas.
Truro	Percy, Thomas Bickle.
Tunbridge Wells	Howard, Richard.
Twickenham	Peake, Henry F.
Uxbridge	Coles, Arthur.
Ventnor	Littlefield, James W.
Wakefield	Chaplin, John Henry.
Walsall	Elliott, George.
Walthamstow	Saunders, Arthur.
Warrington	Greenough, Hugh F.
Warwick	Pratt, Henry.
Waterloo	Pearson, William.
Watford	Chater, Edward Mitchell.
Wednesbury	Gittoes, Samuel James.
Wellington (Salop) ..	Hall, Joseph.
Wellington (Somerset)	Windeatt, George John.
West Bromwich	Roberts, George.
West Ham	Barnes, W. R.
Westbury	Paine, Charles.
Weston-super-Mare ..	Hall, Edwin.
Whitby	Stevenson, John.
Whitehaven	Kitchin, Archibald.
Wick	Miller, Kenneth.
Wigan	Phillips, Jonathan.
Wimbledon	Spencer, William George.
Winchester	Chaston, Alfred Edward.
Windsor	Oldham, William.

District.	Local Secretary.
Wokingham	Rednall, William R.
Wolverhampton	Gibson, Frederic John.
Woodbridge	Betts, Alice Stephen.
Worcester	George, Henry.
Worthing	Cortis, Arthur Brownhill.
Wrexham	Edisbury, James Fisher.
Wycombe	Wilford, Josiah.
Yarmouth, Great.....	Poll, William S.
Yeovil	Wright, Alfred.
York	Sowray, Joseph.

The PRESIDENT said that with reference to some changes in the list he ought to mention that they had lost the services of Mr. Kinninmont, of Glasgow, who was unfortunately suffering from impaired health, having recently had to resign his position on the Board of Examiners from the same cause. Many of them had been associated with him for many years, and though they had sometimes criticised his action with regard to pharmaceutical politics, they all felt that he was a typical pharmaceutical chemist, and did credit to the craft. He was a very capable man of science, and if he had enjoyed more robust health would no doubt have done even more than he had for the Society. Mr. Parkinson, of Liverpool, had been local secretary for some years, and deserved the thanks of the Society. Mr. Barnard Proctor, of Newcastle, had only held office a year or two, but he had written a characteristic letter, in which he said he was getting an old fogey, and hoped he had found it out early enough not to make a fool of himself. Mr. Weston, of Ventnor, had retired from business, and Mr. Coldwell, of Malvern, had also retired, and was succeeded in business and in office by one of the Society's Bell scholars. Several other gentlemen had thought it their duty from various reasons to resign their positions, and he might say with regard to them all that the Council appreciated the services they had rendered, and thanked them accordingly.

SUPERINTENDENTS OF WRITTEN EXAMINATIONS.

It was resolved that superintendents of written examinations be appointed in the same centres as last year, and that the appointments be offered to the local secretaries at those centres.

ASSISTANT LOCAL SECRETARIES.

The PRESIDENT said it was proposed to appoint a certain number of assistant local secretaries in some of the larger centres, but the nominations had not yet all been received, and therefore this would be deferred till next month. The usual plan was for the local secretaries themselves to submit names for the approval of the Council.

DIVISIONAL SECRETARY.

The PRESIDENT moved the appointment of Mr. H. H. Presbury, 30, Church Street, Camberwell, as Divisional Secretary for Dulwich in the place of Mr. Silvers, who had unfortunately died at a comparatively early age from cancer. The motion was carried.

REPORT OF EXAMINATIONS.

October, 1894.

	Candidates.		
	Examined.	Passed.	Failed.
England and Wales:—			
Major	26	11	15
Minor	228	78	150
Modified	1	0	1
Total	—255	—89	—166
Scotland:—			
Major	2	2	0
Minor	91	45	46
Total	—93	—47	—46

First Examination.

Examined.	Passed.	Failed.
300	141	159

22 Certificates were received in lieu of the Society's examination.

FIRST OR PRELIMINARY EXAMINATIONS.

The following list of centres at which Preliminary examinations had been held during the past year, with the number of candidates at each, was ordered to be entered on the minutes.

List of Centres and Table of Attendances of Candidates at each Centre.

	1892. Jan., Apr., July, Oct.	1893. Jan., Apr., July, Oct.	1894. Jan., Apr., July, Oct.	Total number of atten- dances at each centre at 12 exami- nations.
ENGLAND AND WALES.				
Aberystwith.....	6	4	7	17
Birmingham.....	58	80	90	228
Brighton.....	18	4	16	38
Bristol.....	27	37	38	102
Cambridge.....	24	13	18	55
Canterbury.....	10	13	17	40
Cardiff.....	24	38	36	98
Carlisle.....	32	48	54	134
Carmarthen.....	30	32	36	98
Carnarvon.....	18	27	26	71
Cheltenham.....	5	12	12	29
Darlington.....	17	31	28	76
Exeter.....	26	21	19	66
Hull.....	26	16	22	64
Lancaster.....	18	28	13	59
Leeds.....	64	68	61	193
Lincoln.....	34	42	19	95
Liverpool.....	55	71	58	184
London.....	144	165	169	478
Manchester.....	119	123	131	373
Newcastle.....	39	31	47	117
Northampton.....	14	14	4	32
Norwich.....	23	20	34	77
Nottingham.....	49	45	57	151
Oxford.....	13	14	9	36
Penzance.....	10	5	14	29
Peterborough.....	25	15	14	54
Plymouth.....	14	20	24	58
Sheffield.....	29	34	28	91
Shrewsbury.....	16	19	18	53
Southampton.....	38	32	44	114
Worcester.....	3	8	9	20
York.....	27	23	24	74
SCOTLAND.				
Aberdeen.....	63	70	60	193
Dundee.....	61	45	43	149
Edinburgh.....	96	110	111	317
Glasgow.....	77	92	92	261
Inverness.....	7	14	28	49

Total number of attendances at 5 examinations.

Douglas, I. of Man.....	10
Guernsey.....	4
Jersey.....	2
Kirkwall.....	4

CERTIFICATES IN LIEU OF THE PRELIMINARY EXAMINATION.

The PRESIDENT said an explanation came before the Board of Examiners at its last meeting from Mr. L. Ellul, a Maltese gentleman, asking that a certificate

of matriculation at the University of Malta should be accepted in lieu of the Preliminary examination. The Board of Examiners recommended that the certificate be accepted, but could not do so without the sanction of the Council. He therefore moved that the Board be empowered to accept the certificate in the case of Mr. Ellul.

Mr. ATKINS asked if the University of Malta would be put on the list of approved bodies.

The PRESIDENT said no; it was considered better to deal with these cases as they arose.

The motion was agreed to.

MEETINGS OF BOARDS OF EXAMINERS.

The PRESIDENT said it had been suggested that the months of January, April, July, and October should be appointed for the meetings of the Boards of Examiners in 1895.

This, on being put to the meeting, was carried.

GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitors, stating the progress made with cases placed in their hands. A large number of defendants had paid penalties before trial, in others judgment had been obtained, and some were awaiting trial.

Several new cases of infringement of the Pharmacy Acts were reported to the Committee, and proceedings were recommended.

The legal portion of the report was as usual taken in Committee.

The Committee recommended that the local list of subscribers to the Benevolent Fund, hitherto published in the Calendar, be omitted in the next issue. Also that the Council meetings in January and May, 1895, be held on the second Wednesdays of those months, and that the annual meeting be held on May 22.

The Manchester Pharmaceutical Association Scholarship.

A letter had been received from the founder of this scholarship, suggesting the desirability of certain alterations in the conditions, and the Committee, in accordance therewith, recommended that the first three books of Caesar's Commentaries be added to the list of subjects for examination, as an alternative to the first three books of the *Æneid*.

The report and recommendations of the Committee were received and adopted, and a special resolution was passed authorising the Registrar to take proceedings against the persons named.

OPENING OF THE SOCIETY'S NEW HALL AND LABORATORIES IN EDINBURGH.

The PRESIDENT said that they had received an intimation that the new Hall and Laboratories in the Society's house in Edinburgh, which had been in the course of erection during the past eight or nine months, would be finished in about a fortnight. It had been suggested that opportunity might advantageously be taken of the proceedings to hold a reception or sort of house warming in the new premises. He knew how zealously the Committee of the Executive which had had charge of the building had worked, and he thought it had been very appropriately suggested that the reception should be held by the Council in the Society's house on the occasion of the opening of the premises on Friday, November 30, and he hoped as many of the members of the Council as could conveniently do so would attend. This was a subject which the Executive had no power to deal with without instructions from the Council, and he would suggest that they might properly pass a resolution—as he would ask them to do—that a conversation be held, and the Executive for General Purposes authorised to take the necessary steps for issuing

invitations and to carry out the details. Although he himself had not had the opportunity of inspecting the premises, some of his colleagues had, and he understood from them and from the Editor of the Journal that the laboratories and rooms were extremely well arranged and most appropriate to the purposes in view. He trusted they might reflect credit on Edinburgh, and be the means of advancing a cause which their northern friends had equally at heart with themselves, and he doubted not they would appreciate the practical interest the Society would show in the matter. He therefore suggested the following proposition:—

"That a conversation be held in the Society's house in Edinburgh on Friday, November 30, on the occasion of the opening of the Society's new hall and laboratories in York Place, and that the Executive of the North British branch be authorised to take the requisite steps for carrying this resolution into effect, and to issue the invitations in the name of the President, Vice President, and Council of the Pharmaceutical Society of Great Britain."

The TREASURER accordingly proposed, and Mr. Greenish seconded, the adoption of this motion, which was carried unanimously.

DINNER OF SCOTTISH PHARMACISTS.

The PRESIDENT then added that the local members and associates of the Society in Edinburgh proposed to give a complimentary dinner the night before the reception, and they had graciously invited every member of this Council to attend. He suggested that the receipt of this courteous invitation be promptly acknowledged by the Members of Council.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The PRESIDENT said that Mr. Morley, the hon. sec. of the Chemists' Assistants' Association, had forwarded for the consideration of the Council of the Pharmaceutical Society a copy of a resolution adopted by the Chemists' Assistants' Association at a meeting held on October 18, the result of a discussion raised by the reading of a paper by Mr. E. H. Gane, entitled "The duties of the Pharmaceutical Society as an educational body"—"That this meeting of the Chemists' Assistants' Association is of opinion that a course of post-graduate lectures and laboratory demonstrations would be appreciated and supported, and requests the Council of the Pharmaceutical Society to consider the advisability of providing such a course during the coming winter." He suggested that this matter be referred to the Library Committee for consideration, and this was agreed to.

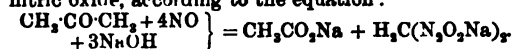
A letter was also read from the Secretary of the Nova Scotia Institute, thanking the President and Council for their courtesy in sending a copy of the Journal.

Proceedings of Societies in London.

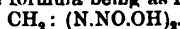
CHEMICAL SOCIETY.

The opening meeting of the session was held on Thursday, November 1, the President, Professor Armstrong, F.R.S., in the chair. Before proceeding to the reading of papers, the President suggested that instead of reading the qualifications and the names of proposers of candidates for election into the Society, only the names of the candidates should be read. This received approval from the Fellows present, and after about forty names had been read and other formal business transacted, Mr. MacDonald gave an account of the work done by himself and Professor D. O. Mossan on "The Action of Nitric Oxide on Sodium Ethylate." This was a preliminary notice, necessitated by the publication (*Ber.* xxvii., 1507) of a

paper covering the same ground, by Traube. Nitric oxide gas is absorbed by sodium ethylate, and the sodium salt of a new acid produced, and from the analysis of various other salts which were prepared the authors arrive at the formula for the acid— $\text{CH}_2\text{N}_2\text{H}_2\text{O}_4$. The acid itself when prepared from the copper salt is found to be unstable. They also found this acid produced when nitric oxide was passed into a mixture of sodium amalgam and alcohol. Traube found that a similar reaction occurred between acetone, caustic soda and nitric oxide, according to the equation:



The acids obtained by the authors and Traube are identical. In conclusion, they gave the probable formula for the acid based on the reactions and the fact that the acid gave Liebermann's reaction for the nitroso group, the formula being as follows:—



The next paper was by Mr. A. P. Laurie, M.A., on "The Electro-motive Force of Alloys in a Voltaic Cell." These experiments were conducted in order to throw light on the vexed question—the composition of alloys, whether chemical compounds or mixtures. If in a voltaic cell the copper and zinc elements are attached to a Thompson's Electrometer, an electromotive force is noticed. If, however, the zinc be replaced by copper, little or no force is produced, but if to the Cu is added a little zinc by mechanical means, *e.g.*, deposition on the surface or mechanical attachment, the E.M.F. at once rises to the maximum. If, however, a chemical compound is formed, the E.M.F. does not so rise. It is possible then by noticing the E.M.F. to determine whether alloys contain chemical compounds or are mere mixtures. In this way the author showed that only one alloy, tin-gold, is a chemical compound, the others, tin-bismuth, lead-bismuth, etc., being mixtures. This supports previous conclusions derived from studies of the electrical conductivity of alloys. He also found evidence that in certain alloys there seemed to be something of the nature of solution between the metals.

The last paper read was by Dr. Bone on the incomplete combustion of gaseous carbon compounds, and dealt with the incomplete combustion of mixtures of acetylene, oxygen, nitrogen, etc., after which the meeting terminated.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, November 1, the President, Mr. R. H. Jones, in the chair, a paper was read on "Recent Advance in Photography" by Mr. E. W. Hill.

After a brief account of the early history of photography, the author drew attention to several new developers which had been introduced of late years to take the place of "Pyro," and amongst the number he mentioned "Eikonogen," glycine, amidol, hydroquinone, etc. He then described somewhat in detail the use of "Isochromatic plates" in photographing coloured objects. When a photograph is taken of a coloured object, *e.g.*, a picture or group of flowers, it is noticed that none of the effect of light and shade due to colour is reproduced. This is on account of the difference of effect produced by the same ray of light on the retina of the eye and on the silver salt in the photographic film respectively. The yellow rays, for example, possess the greatest illuminating power, but act only feebly on the silver salt. Thus, on an ordinary plate the portion acted on by the rays of the greatest illuminating power suffers the least chemical change, and in the resulting print is quite black. If, however, the gelatin emulsion of haloid silver salts is treated with eosine, and the so-called "pink emulsion" spread on the plates, on the light being allowed to pass through a screen of transparent red

glass before reaching the sensitive film, the lights and shades obtained in the photographs by this method approximate much nearer to the actual effects produced than those obtained by the use of ordinary plates. It is thus rendered possible by the use of these isochromatic plates to photograph oil paintings, etc., and specimens of photographs taken with ordinary and isochromatic plates of the same object were passed round. The principle of "spectrum" photography was then explained, how by using a background of mercury in contact with the film a negative was obtained which showed all the colours of the spectrum in their correct tints. Since this method only yields one negative, and this cannot be reproduced, it is clear that the method must be greatly improved before it is of any practical value. Another method has been used for obtaining "photographs in colours," by means of which any number of duplicates can be obtained. The principle consists in obtaining three negatives by the use of screens of the three primary colours—red, blue, and yellow. From these negatives three plates are produced by zincography, and the paper is printed in the different colours superposed on one another by the zinc plates obtained from the negatives. Reference was then made to the application of photography in astronomical science, to the photographic chart of the heavens now in progress of formation, and the discovery of binary stars and their movements by the spectroscope, such a movement resulting in the displacement of lines of the spectra which are photographed. The application of photography in "high-speed photography," such as the production of photos of the splash of drops and that of a rifle bullet in motion, showing a pad of compressed air in front of the projectile, was briefly noticed, and the author concluded his paper by a brief reference to the different methods of photo printing and the use of the camera in medicine.

The President said that chemists should possess some knowledge of photography, since amateurs frequently came to them for advice as well as to be supplied with poisons which could be obtained from them alone. Messrs. Morley and Crouch commented on the relations between electricity and light as worked out by Hertz and Clerk Maxwell, and Mr. Hart followed with a few remarks on lenses, noticing in particular a new form, the "Telephotograph lens," by means of which photographs of objects at a distance could be obtained of large size without using long extension cameras, *e.g.*, in yacht photography. Mr. Jowett made a few remarks on the help photography had given to astronomy, in particular with regard to those interesting objects—nebulae. Mr. Sage, referring to the eosine required to prepare the pink emulsion, said that the eosine of commerce varied very much. Mr. Hill having briefly replied, the meeting terminated.

ROYAL MICROSCOPICAL SOCIETY.

A meeting of this Society was held on October 17, the Rev. Edmund Carr in the chair. Dr. W. H. Dallinger, F.R.S., described a new model microscope which had been made by Messrs Watson, and Messrs. Ross exhibited examples of their "Eclipse" microscopes. Mr. R. T. Lewis exhibited some parasites which had been found upon a penguin from Isipingo, Durban. Dr. H. Stolterfoth's paper "On the Genus *Coccythron*" was read by Professor Jeffrey Bell. Mr. E. B. Green read a paper "On some Parasitic Growths on the Root-hairs of Plants," concerning which Mr. A. W. Bennett made some remarks. Professor Bell called attention to the loss the Society had suffered by the death of Dr. G. E. Blenkins, a former secretary. Mr. F. Chapman gave a *résumé* of part of his paper on the "Foraminifera of the Gault of Folkestone."

Chairman and Professor Bell made a few remarks on Chapman's contribution. Owing to the absence of the author, Mr. Nelson's paper "On the Measuring of the Refractive Indices of Various Media" was deferred to the next meeting on November 21.

WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

At a meeting of the Committee, held on October 31, the following gentlemen were elected officers for the ensuing year:—President, Mr. R. H. Parker; Vice-president, Mr. J. O. Hyslop; Hon. Treasurer, Mr. H. Mathews; Hon. Secretaries, Mr. Herbert Crackall and Mr. A. Dyson.

Provincial Transactions.

BRIGHTON JUNIOR ASSOCIATION OF PHARMACY.

This Association held a musical and social meeting on Wednesday, November 1, under the chairmanship of Mr. W. H. Gibson. There was a large attendance, and the contributions to the programme were very numerous and well rendered. Mr. E. Hedgcock officiated at the piano. Great credit is due to the energetic Hon. Secretary (Mr. F. A. Crowhurst) for the successful evening.

LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.

On Thursday evening, November 1, at the University College, Liverpool, an interesting historical lecture was delivered to a large number of members of the above Society, by Mr. Charles Sharp, F.L.S., entitled "The Land of Green Ginger." At the close of the evening a hearty vote of thanks was accorded to the lecturer.

LIVERPOOL CHEMISTS' ASSOCIATION.

At a general meeting of this Association on Thursday, October 28, Mr. M. Conroy in the chair, five new members were elected.

Mr. John Smith referred to Mr. Parkinson's retirement from the office of local secretary for the district, and thought he ought not to be allowed to sever his official connection with the Pharmaceutical Society without being thanked by the chemists of Liverpool in the faithful and energetic manner in which he had executed his duties. He knew that he expressed the general feeling when he said that they greatly regretted that Mr. Parkinson had arrived at that decision.

The chairman, Mr. Cowley, and others endorsed what had been said, and a vote of thanks to Mr. Parkinson was heartily accorded.

Mr. John Smith was elected President for the ensuing year.

Mr. R. C. Cowley then read a paper on "Some Drugs and Chemicals of the B.P."

In this the drugs were dealt with more especially in reference to the approaching revision of the British Pharmacopoeia. Gum acacia, B.P., it was suggested, means the gum of *Acacia senegal* from Senegal, and the geographical source should be specified accordingly, as climatic difference produced variations in the gum. Vinegar should be omitted from the B.P., or the quantity of total solids be mentioned. Acid, hydrobrom. dil. if made from PBr, could be free from H_2SO_4 , and this alternative method of preparation should therefore be official. Acid, lactic, should be described less vaguely, and more stringent tests be imposed to ensure its purity. Adeps op. should be free from cotton-seed oil, and a test run. Cataplasmata might be omitted. Chysaron should be more explicitly described. Confections

of opium, pepper, scammony, and turpentine are nearly obsolete. Ergot should be as fresh as possible. Fluid extracts contain more of the active principles than infusions, and are therefore preferable. Solid extracts should be standardised. Ferri arsenias usually contains a large proportion of ferric arseniate, which is less soluble than the ferrous salt. Ferri carb. sacch. should be renewed frequently. Ferrous salts should be determined by potassium permanganate instead of the bichromate, and reduced iron by mercuric chloride. Glycerin of tragacanth was often too hard for a pill excipient. Infusions should only be used when fresh. Lin. terebinth. should have its consistence specified. Lupulin should not yield 15 per cent. of ash. Manna might be distinguished by the amount of mannite present. Pil. phosphori should have an improved formula. Reference was also made to the occasional presence of methylated spirit in spirit. æth. nit.; the methods of preparation of syrups and tinctures; the suitability of paraffins as the vehicle in ointments, etc., etc.

The Chairman said that Mr. Cowley had covered a lot of ground, and had provided excellent food for discussion. Some of the suggestions offered were good, but others he could not altogether approve of. It would be difficult to insist that certain drugs or their preparations should not be employed if kept in stock beyond a stated time. The list of fluid extracts should be enlarged, as they were really excellent preparations, and much superior to infusions. He did not see any good reason for departing from the bichromate test for ferrous preparations; he used it extensively, and always found it satisfactory. Percolation was undoubtedly a very useful method of exhausting certain drugs, but on the whole the B.P. methods were very satisfactory. He would give no encouragement to the use of water for displacing spirit. It was important for various reasons that tinctures should be of full alcoholic strength, and this could not be guaranteed where water was used for displacement. He would be glad to see a test for the presence of methylated spirit under spirit of nitrous ether.

Mr. Wokes had found that glycerin of tragacanth along with a few drops of syrup was a better excipient than the former alone. A small quantity of chloroform was an excellent preservative for infusions. He recommended one part of heavy magnesia and two of the light for pulv. rhei co. Percolation was not satisfactory with all tinctures, and he had found that displacement by water was useful in some of the rectified spirit tinctures, but the process required to be carefully watched.

Mr. J. Smith thought recipes for poultices were no more required in the Pharmacopoeia than for beef-tea. The fluid extracts could, he believed, be made more satisfactory by percolation than by boiling or maceration. As to tinctures, unless the drug was in a fairly fine powder percolation alone was quite inadequate. The relative value of percolation and maceration depended entirely upon the state of division of the drug, and this was also the case with displacement by water, which would probably answer well in the case of a powder. He considered the paraffin bases very suitable for some ointments. Respecting names of new remedies, he remarked that the B.P. authorities had never made proprietary articles official.

Mr. Buck commented upon several of Mr. Cowley's suggestions, and proposed the use of a little more water in the preparation of turpentine liniment.

Mr. Hornblower thought that as the confections were still used to no small extent they were likely to remain in the Pharmacopoeia, and that the directions for making the cataplasmata were a guide as to what poultices should be. He endorsed the chairman's remarks as to the difficulty, perhaps the impossibility,

of carrying out restrictions as to limit of time after which drugs should not be used. His experience was that B.P. syrup did crystallise, and he attributed that to the greater purity of sugar which now contains less water. He was in favour of the maceration and percolation process for tinctures as now ordered. Displacement by water was quite useless when operating with large quantities. He considered it important that tests for methylated spirit in spirit of nitrous ether should be included in the Pharmacopoeia.

Mr. Cowley, in replying, said that many of the members had greater experience than himself in manufacturing, and had been able to offer much useful criticism. The chairman and Mr. Hornblower had dealt very effectively with many of the subjects of his remarks. He regretted that, having to come forward at short notice, and being unable from unavoidable circumstances to make the experiments he wished, he had to submit his paper in an incomplete form.

Messrs. Maw, Son and Thompson exhibited some pharmaceutical apparatus at the meeting, including a set of aluminium grain weights, metallic pill machine, piping press, a French tincture press, ointment mixer, etc., etc.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The first ordinary meeting of this Association was held on Thursday, October 1, Mr. John Foster, Vice-President, in the chair, the President being unable to attend. The discussion of the resolution submitted at the meeting held on June 28 last, by Mr. J. Anderson Russell, and adjourned from that meeting, was again brought forward. The seconder, Mr. D. S. Robertson, had communicated his inability to be at the meeting, and Mr. Russell was requested to reintroduce the business. Mr. Russell, in a few words, referred the members to the report of former meeting in the *Pharmaceutical Journal* of July 7, and shortly recapitulated the clauses of the resolution.

Mr. Laing said the business before the meeting was the adoption or rejection of Mr. Russell's motion. If they were content with the present condition of things there was no use in discussing it. He was not content, and would support it. It asked for the registration of open shops for the sale of all drugs, and confined the sale to registered druggists.

Mr. Moir said in some parts he entirely agreed with Mr. Russell. That all persons engaged in pharmacy be registered he entirely agreed with, also that open shops be registered, and that registration be maintained under an annual registration fee, which was quite right. But the fourth clause, that medicines be compounded or distributed by registered graduates only, he was not so sure about. He would be very grateful for it if it were granted, but he was firmly persuaded no legislature would grant it, no sensible men would listen to it.

Mr. Robb considered that the legislature would do very little on the lines of Mr. Russell's resolution. It sought to encourage free trade and not monopoly. We had got into many vexatious things through the '68 Act. He thought education a good thing for everyone, and no one could get too much of it, but so far as conducting their businesses was concerned, the Society's educational plans were of no service. He would rather be reactionary, do away with the Pharmacy Acts, and have free trade not hampered in any way.

Mr. Boyd said the proposed resolution omitted mention

of limited companies, and they led to a very unsatisfactory state of things. He would like to get a better footing, but he disagreed with having an annual fee, it would just be like a state of slavery. He had been connected with the Pharmaceutical Society since passing his First examination, and had a regard for it, but he would not agree to give it power to erase names from the Register. If they went to Parliament seeking a monopoly, they would surely lose the privileges they already enjoyed.

Mr. J. Bruce thought the motion should be withdrawn, lest they be made the laughing stock of the country.

Mr. Robinson said the motion did not rest itself into anything palpable enough. He thought some benefit might be gained if the sale of poisons was as closely watched as the sale of spirits, so that sales could be traced in all instances. He would like a clause giving sole control of the poison schedule to registered persons only, who should get the remuneration for distributing poisons.

Mr. Moir suggested that the motion should be reconsidered by Mr. Russell, the penal clause amended, and again submitted to the Association. This was put to the meeting and agreed to.

Mr. David McNey, Thornhill, joined the Association, and the business was concluded.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

DEFECTIVE SODA AND POTASH WATER!

In Dumfries Sheriff Court, on November 2, William Graham Johnstone, chemist, Dumfries, was charged with a contravention of the Sale of Food and Drugs Act by selling to the inspector as soda water the bottles of carbonated water, which contained sodium carbonate of soda, and other three bottles as potash water, which contained no bicarbonate of potash. W. Thomson, solicitor, tendered a plea of guilty on his behalf, accompanied with the explanation in regard to the first charge, that this was the beverage usually sold as soda water, and that prepared as described in the British Pharmacopoeia it would contain so much alkali as to be not only disagreeable to the taste but injurious when employed as a beverage. In regard to the potash water, he stated that soda water had been given instead through the fault of the apprentice. Sheriff Campion imposed a penalty of £5 and a guinea of expenses.—*Scotsman*.

POISONING CASES AND INQUESTS.

CHILD POISONED BY MORPHINE.

Elizabeth Cannon, aged 14 months, of John Edward Street, Redditch, died on Thursday, November 1, from the effects of an overdose of morphine contained in a cordial. Verdict: "Death by misadventure."—*Manchester Guardian*.

CARBOLIC ACID CASES.

On October 31, a little girl named Bain, living at Ramsey, Isle of Man, drank some carbollic acid from a half-pint beer bottle and died a few hours afterwards.—*Evening News and Post*.

Thomas Price, aged 18, of Hughes Street, Ardsley, died on Wednesday, October 31, after taking carbollic acid. Verdict: "Suicide whilst insane."—*Manchester Courier*.

Reviews and Notices of Books.

ATTS' DICTIONARY OF CHEMISTRY. Revised and entirely rewritten. By M. M. PATTISON MUIR, M.A., and H. FORSTER MORLEY, M.A., D.Sc., assisted by eminent contributors. Vol. IV., with Addenda. Pp. 922. London: Longmans, Green, and Co.

The general character of the work, which is now completed by the publication of this volume, has already been described in previous notices of the other volumes, and it may be added that, in this respect, the volume now issued fully supports the high appreciation which the 'Dictionary of Chemistry' has already received. The first 102 pages are devoted to continued description of the phenyl compounds, one of which were dealt with in the third volume. Phosphorus and its compounds occupy the next fifty pages. Then follows an interesting general article of 96 pages on Photographic Chemistry, by Professor Raphael Meldola, and the description of compounds related to phthalic acid occupy twelve pages. Immediately following is an article of one hundred pages treating of the physical methods used in chemical investigation which are now becoming of such great importance. The several sections into which this article is divided are written by Dr. Capstick, Mr. George Gladstone, Professor Hartley, Professor Ostwald, and Mr. Muir. The next fifty-six pages are occupied with articles on various subjects, including the compounds of Platinum, Potassium, Propyl, etc. A comprehensive article of sixteen pages on the Proteids is written by Professor Halliburton. The following 142 pages contain miscellaneous articles, extending from Protocatechuic acid to Solanine, and including Selenium, Silicon, Silver, Sodium, and their compounds. An article of twenty pages on Solutions is written in two sections by Professor Arrhenius and Mr. Pickering. Another of six pages on Specific Volumes is written by Professor Thorpe. Then follow articles on Starch (six pages) and Sugars thirty-six pages, by Mr. Sullivan, those in the intermediate space including Stearic acid, Strontium, Strychnine, and Succinic acid, and their compounds. Sulphur and its compounds occupy ninety-two pages; Tannins, written by Dr. Ideal, six pages; Terpenes, written by Professor Tilden, twelve pages, and the remaining 222 pages are chiefly occupied by articles on Thallium, Thorium, Tin, Titanium, Toluic compounds, Tungsten, Uranium, Urea, and Uric acid, Vanadium, Water, Xylene compounds, Yttrium, Zinc, Zirconium, and an addendum extending over twenty-five pages contains brief accounts of some of the chief work done in descriptive organic chemistry since the publication of the previous three volumes of the Dictionary.

It is no disparagement of the general excellence of the matter in the volume to select for special mention a few articles on Proteids, Starch, and Sugars. The existing chemical knowledge of the substances related to albumin is still very imperfect in comparison with the interest attaching to them as materials connected with the manifestation of organic activity, both

in plants and animals. But the amount of work that has been done with a view to unravel their constitution is very considerable, and the references given to original memoirs on the subject, in the course of the article in which the proteids are described, will be very serviceable to those who desire more detailed information than can be comprised in a dictionary article.

The articles on Sugar and Starch relate to a branch of chemistry which has recently received important advance, and they furnish a comprehensive summary of the work done, such as might be expected from the writers' intimate acquaintance with the subject.

The articles on Terpenes and Tannin are in like manner excellent and useful summaries of chemical research. The article on Solutions deals with a very interesting and important subject which has recently engaged the attention of chemists from two opposite points of view, and in order that they may both be presented to the reader, part of the article has been written by the originator of the hypothesis of electrolytic dissociation, while the other part has been written by one of the leading supporters of the hydrate hypothesis.

Considering the vast number of descriptive data which have to be embodied in a work of this kind, it may be open to question whether such a subject as that of solutions, and more especially the one of physical methods, might not be advantageously dealt with in a separate work, as already suggested in regard to the articles on analogous subjects in previous volumes. That some such division of the subject matter might be desirable is indicated by the remark of one of the Editors, that an account of what has been done in the department of organic chemistry since the previous volumes of the Dictionary was published would occupy many hundred pages. But whatever opinion may be entertained on this point, it is beyond question that, in the Dictionary, chemists are now in possession of a very useful work of reference, for providing which the publishers, editors, and contributors are entitled to a large measure of appreciation and gratitude from those who have need of such a work.

THE NATURAL HISTORY OF PLANTS. By KERNER and OLIVER. Part 6. Pp. 561 to 672. Illustrated. 2s. 6d. nett. London: Blackie and Son. From the Publishers.

In this part of the work we are introduced to the study of the ultimate structure of plants—protoplasm and its constructive activity being considered at length. Plant-forms as completed structures next engage attention. Thus, the progressive stages in complexity of structure from unicellular plants to plant-bodies are described; then the form of leaf-structures—cotyledons, scale-leaves, foliage-leaves, and floral leaves; and last, the forms of stem-structures. The illustrations are, as usual, well calculated to elucidate the text, and a coloured plate represents the manner in which prickly-pears grow on the plateau of Anahuac, Mexico.

New Books and New Editions.

The following are amongst the most recent scientific and technical publications:—

INDEX KEWENSIS. AN ENUMERATION OF THE GENERA AND SPECIES OF FLOWERING PLANTS. Compiled by B. DAYDON JACKSON. Part III. 42s. to subscribers. Oxford, Clarendon Press.

CARBON PRINTING. No. 8 of the Amateur Photographer's Library. By E. J. WALL. 1s. Hazell, Watson.

THE ROYAL NATURAL HISTORY. By RICHARD LYDEKKER, B.A., F.R.S., etc. Illustrated. 9s. Vol. II. F. Warne and Co.

LIFE AND MIND ON THE BASIS OF MODERN MEDICINE. By ROBERT LEWINS, M.D. W. Stewart and Co.

POPULAR NATURAL HISTORY FOR BOYS AND GIRLS. By W. J. GORDON. 2s. 6d. The Religious Tract Society.

A TREATISE ON CHEMISTRY. By SIR H. E. ROSCOE and C. SCHORLEMMER. Vol. I.—the Non-Metallic Elements. New edition, completely revised by Sir H. E. Roscoe, assisted by Drs. H. G. Colman and A. Harden. Illustrated. 21s. Macmillan.

Obituary.

Notice has been received of the death of the following:—

On October 27, Richard Flowerdew, Chemist and Druggist, Eye. (Aged 53.)

On October 31, Samuel Rhodes, Chemist and Druggist, Penrith.

On November 2, Richard Procter, Chemist and Druggist, Penarth.

On November 5, Ralph Burton, Chemist and Druggist, Manchester. (Aged 61.)

Correspondence.

SALE OF PROPRIETARY MEDICINES.

Sir,—The method suggested in Mr. Vizer's letter re the sale of proprietary medicines is not the one I would suggest—to relieve the retailer of the responsibility of selling an article containing a scheduled poison without affixing a poison label and the name with address of seller. Holding the view that I do of the seller being, in the first instance, the manufacturer of such an article, I would suggest that a memorial be obtained from the qualified chemists and druggists in business on their own account (through the local secretary of each division) and presented to the Council of the Pharmaceutical Society, requesting it "By virtue of the powers vested in the Society, under the Charter of Incorporation and the Pharmacy Act, to give notice to the manufacturers that any preparation containing a scheduled poison shall have it stated on the wrapper outside the bottle, with the name of the article, the word 'poison,' and name and address of the maker, with a label containing the same information on the bottle no matter how small a quantity of poison the preparation may contain." Any breach of this Act shall render them liable to proceedings under the Act, to be followed by the name and address of the offender, together with the date of sale, being gazetted as in the case of bankrupts. This last should be done because the Society is precluded from publishing such offences if penalties are paid into court, from fear of such publication being construed as a libel. With reference to our esteemed President's views as to our finding out whether such articles contain a scheduled poison for ourselves—seeing that we have an analyst (Mr. Eastes) who can come forward to give evidence in these prosecutions, I maintain that he should be employed to do this for us, and if he finds a case where the Act is infringed, upon his report to the Council pro-

ceedings should be taken. Until company trading is an end to by the prosecution of unqualified managers, directors, and such prosecutions are made public, so will there be disaffection in the ranks of qualified men keep aloof from belonging to the Society, saying, "The Society does not protect our interests."

Torquay.

W. J. RAWLIN.

THE NOMENCLATURE OF OFFICIAL REMEDIES.

Sir,—I cannot let the very able letter of "Devotion" in your issue of October 27, pass without giving it my earnest approval. I agree with it *in toto*, and hope each suggestion he has made will be considered at the revision of the British Pharmacopoeia. As I am a progressionist in pharmaceutical matters, I do not shall not be thought retrogressing if I would suggest some of the old titles, which are now expunged, to be re-introduced. May I suggest that in these days, so many, and in some cases nervous, patients can read medical man's prescription, that instead of liquor *calis*, liquor *arsenici hydrochloricus*, liquor *arsenici hydrargyri iodidi*, liquor *morphine hydrochlor.*, liquor *morphine acetatis*, the terms liquor *solutio solventis mineralis*, liquor *Donovani*, liquor *meconii hyd.*, and liquor *meconii acetat.* be accepted? I have many instances of leading medical men always using these terms.

Ramsgate.

W. F. GAIN.

Diary of the Week.

SATURDAY, NOVEMBER 10.

Pharmaceutical Football Club v. Breweries, at Wobolt Farm, Shepherd's Bush, at 8.15 p.m.

TUESDAY, NOVEMBER 13.

Royal Photographic Society, at 8 p.m.

"A simplified form and improved type of Photographic Lens," by H. Dennis Taylor.

Presentation of the Society's Medal.

WEDNESDAY, NOVEMBER 14.

Pharmaceutical Society of Great Britain.

Library, Museum, School, and House Committee, at 11 a.m.

Evening Meeting in London, at 8.30 p.m.

"The Nervous System in the Vegetable World," by Professor Reynolds Green.

Manchester Pharmaceutical Association, at 7.30 p.m.

"Eighteen Months' Work on the Pharmaceutical Council," by J. Bymer Young.

Smoking Concert, at 9 p.m.

Edinburgh Chemists', Assistants', and Apprentices' Association.

Opening Meeting.

THURSDAY, NOVEMBER 15.

Chemical Society, at 8 p.m.

"The Alkaloids of *Corydalis cava*. 1. *Corydalis* Part IV. 2. *Corydalis*," by Professor J. I. Dobbie and A. Lander.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

"Nostrums," by J. Gilbert Jackson.

"Retail Prices," by B. H. Mitchell.

Linnean Society of London, at 8.30 p.m.

"A Revision of the British Copepoda belonging to the two Genera *Bradya* and *Kicinosoma*," by The Scott.

"Recent observations on the plant yielding *Blas* (*Cannabis sativa*)," by Dr. D. Prain.

Chemists' Assistants' Association, at 8 p.m.

Annual Conversazione at the Portman Rooms.

Glasgow Pharmaceutical Association.

"The early History of Botany," by Professor Kay.

School of Pharmacy Students' Association, at 7 p.m.

Election of Officers.

Introductory Address by R. Hampson, Esq.

FRIDAY, NOVEMBER 16.

The Quekett Microscopical Club, at 8 p.m.

Ordinary Meeting.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Antcliffe, Blackburn, Blair, Clague, Clarke, Conroy, Hill, Jones, Lunan, Marsden, McLoughlin, Morley, Paine, Robins, Stemmler, Thompson, Thomson.

EIGHTEEN MONTHS' COUNCIL WORK.*

BY J. RYMER YOUNG.

In venturing to address you on the subject of the Pharmaceutical Society and its doings, I should explain that your indefatigable secretary settled the matter by saying that I ought at least to take my fair share in the work and deliberations of this Association, a suggestion which applies with not less force and pertinence to many more of our members, who might in all conscience bestir themselves with advantage to their personal good and to the general weal. The *dolce far niente* attitude, so greatly affected by pharmacists, is of course luxuriously easy and comfortable enough, but very treacherous. One is apt to find after these "Rip Van Winkle" intervals of indolent repose, that we have slumbered a little too long—the times have gone ahead of us, whilst we are left woefully behind.

Not much better than the chronic sleeper, is the eternal grumbler—a plant of perennial growth and, like the poor, always with us. This is the individual who is ever prepared to find fault with, and censure, everything that everybody or anybody does, or attempts to do, in the interest of the trade or its organisations. He is never prepared, under any circumstances, either to propound schemes, invent remedies, or suggest methods of any real utility; nor is he willing even to encourage with his sympathy and support those who, in their own way—good, bad, or indifferent—are doing their level best to put things, and keep them, in the middle of the road.

It was at first my idea to talk this evening on some one of the many complex scientific subjects relating to our calling. But your secretary has views of his own, and sticking to them like a leech he will not be shaken off. Give us an opportunity for a general discussion on ordinary trade topics! That was his mandate, and so it becomes my brief.

I do not forget, of course, that Pharmacy Acts and examinations, company trading and poison regulations have all had your frequent and careful attention. Still, the troubles that so beset the "mind pharmaceutic," the anxieties and worries that come of illegitimate competition, the consciousness that our remuneration, always absurdly inefficient and inadequate, is, nevertheless, a constantly diminishing quantity—all these, and other matters, are still before us, in painfully bold outline, haunting our mental vision like a perpetual nightmare. Perhaps, therefore, we might do worse than once more devote a few minutes to their discussion.

It is now about eighteen months since I had the privilege of becoming a member of the Pharmaceutical Council, for as a privilege and honour I have always regarded it. I keenly appreciate the fact, and acknowledge with extreme pleasure, that the result of the election, as concerns myself, was entirely due, primarily, to the splendid way in which my candidature was initiated and supported by this Association and its officers, and indirectly to the valuable help from kindred associations which Manchester friends were willing and able to secure in my interest. This district has emphatically demonstrated that it can secure the election of its nominee, whenever the members of this Association

choose to interest themselves in the matter in an active manner. The fault is entirely your own if you are inefficiently represented, either in point of quality or number. It has always been to me a source of satisfaction that you never required from me conformity to any particular policy or line of conduct. I have never felt that I was regarded as a mere delegate with limited power of a purely automatic character. Indeed, I may say frankly that I could not possibly have joined the Council on any such conditions. True, there was a tacit understanding that my sympathies were in accord with a policy of action and progress, rather than of ultra-respectable stagnation, and in the exercise of my privilege as your representative at Bloomsbury Square, I have invariably voted as my judgment dictated. I have never hesitated to express my views with perfect candour on any subject that came before the Council, without any thought as to whether such views were palatable, heterodox, or popular. At the same time a little discussion on things in general will help me to gauge your ideas and wishes, to ascertain your opinions, and so assist very materially in formulating and possibly modifying my own.

I need hardly remind you that most important changes will very soon take effect regarding the examinations. In the first place, it has been decided that no examiner shall retain office for more than four consecutive years, and further, that no examiner shall be eligible for re-election until the expiration of not less than one year. The appointment is, of course, an annual one, and an examiner need not necessarily be continued in office for more than twelve months, but the provision which makes retirement compulsory after four years, is, I think, a wise one, since it makes occasional alteration in the complexion and personnel of the Boards possible without involving friction or annoyance to those retiring. That there should be in existence a constant but gradual process of addition and elimination I am convinced is highly desirable, not only in the case of the Board of Examiners but in that of the Council itself.

In the second place it has been decided to strengthen the Board by the appointment, in the purely scientific subjects of chemistry and botany, of a limited number of professional teachers as examiners in those two departments. Their duties will be confined to those subjects only. It is not for one moment to be inferred that the present staff is either inadequate or incompetent in these particular branches, but it is argued, with much show of logic and probability, that gentlemen constantly engaged in teaching botany and chemistry are in a much better position to know what may reasonably be expected from candidates seeking the diploma of the Society. The art of examining—for art it is—is not necessarily possessed by the profound scholar, or the skilled scientist.

The whole matter was exhaustively investigated by a thoroughly representative committee, whose subsequent report was of such a nature that I had no hesitation in supporting it. At the same time I should not feel disposed to carry this innovation further than the two subjects named. In pharmacy, materia medica, and dispensing, there can be no better examiner than the pharmacist pure and simple.

It is hardly likely that anyone here can have

* Address to the Manchester Pharmaceutical Association, delivered on Wednesday, November 14.

failed to notice with surprise, if not positive consternation, the very high percentage of failures amongst candidates for qualification, especially the Minor. Although I am informed that it is not higher than in the case of most of the scientific and medical examinations, still the amount of rejection does seem enormous, and I determined to try to find out for myself how this deplorable state of affairs came about. With that end in view, I passed the greater portion of a day in the Examination Hall, where I met with every possible courtesy, and saw a number of candidates examined. I can safely say, from what I saw and heard there, that the secret of most of this wholesale "slaughter" is the appalling ignorance and astounding stupidity of the candidates themselves, many of whom are so utterly unprepared that one could not seriously suppose they ever imagined it possible to get through. Indeed, I am given to understand that many do actually enter with the sole idea of seeing what the ordeal is like—sheer waste of money and wanton waste of time.

It cannot be denied that among those who succeed in satisfying their examiners, some are distinctly brilliant, and answer with the greatest ease the questions that so effectually bowl over the great majority.

First and foremost, the early education of many candidates must have been lamentably bad. Faulty grammar and erratic spelling, shaky composition and miserably weak descriptive powers, were all unmistakably indicative of defective early training, and the conviction was irresistibly forced upon me that the special education of the pharmacist depends very largely upon the general education received before the study of pharmacy is commenced at all—the education of home, school, and association. My opinion is that a still higher, nay a much higher, standard is required as regards the Preliminary, which should certainly be passed before apprenticeship. The youth who finds it difficult to pass a much harder examination than the present Preliminary has surely mistaken his vocation. He will be wise in recognising his error whilst yet on the threshold only of his career, and whilst there is yet time to seek a more congenial calling.

I am strongly inclined to think that a compulsory curriculum of study would greatly tend to improve matters, and to ensure thoroughness and solidity of preparation in the scientific and practical subjects—though I am by no means sure that pharmacy with such restrictions, superadded to those now existing, would offer sufficient reward to attract the type of men we want in our midst. That is a matter of opinion, but with this we really ought to have no concern. It is our plain duty to maintain a high standard of qualification whatever the consequences may be, and it is not less our duty to make this elevated standard attainable and possible. I am prepared to believe that it might have the effect of checking somewhat the number of men who are seeking entrance into our business. But seeing that the business is already inordinately crowded, I do not see that this result need embarrass existing chemists, who can have no possible object, advantageous to themselves, in the wholesale manufacture of opponents. At any rate, if we had fewer, we should have very much better men, and that would be ample compensation. The system

by which candidates persistently neglect every opportunity for acquiring knowledge during their apprenticeship, and then expect a coach to make modern Solomons of them, by some magic rub of Aladdin's lamp, in a few weeks' high pressure, hurry-and-scurry work, is largely accountable for the almost idiotic answers frequently heard during examination; some of those related to me by examiners (mostly pharmaceutical) are amusing enough to bear repetition.

One candidate said that benzoin should always be rejected if it had any white pieces in it. The natives collecting it were in the habit of pushing pieces of chalk into the soft places. Another made argent. nit. by putting silver into nitric acid, and allowing it to crystallise out when it had ceased working. This answer is refreshingly brief, but lacking a little in detail.

A botanical examinee, in naming a dandelion leaf, said that "*Dens leonis*" meant lion's den, an answer more than once heard in the Examination Hall. Another, when asked to describe the male and female organs of a plant, frankly expressed his surprise that they had any. Another thought musk was obtained from the "muscat," but whether the "muscat" of Alexandria he could not say. Still another individual said that aq. camph. was made by floating a piece of camphor on the surface of the water, the air assisting the camphor to dissolve. Probably the candidate was in this instance relying on his practical knowledge, for many of us have seen it made that way, but it is not the B.P. method. Avidupois was the name of a man. Cream of tartar was the precipitate which came to the top when salts of tartar was dissolved in water. Nitrate of silver pills should be coated to prevent them dissolving and injuring the coat of the stomach. Cold water is used in making infusion of calumba, because hot would dissolve the gelatin. Pepsin is made by scraping the back of a pig. Another candidate was not quite certain whether verdigris was the sulphate of iron or zinc. The examiner kindly gave him three months to consider this matter and others, about which he was also equally at sea.

And so every examiner could give numerous instances of answers not less absurd and grotesque, all more or less the result of imperfect reading and hasty, ill-considered, slipshod work. The probability is that a good many of these men had undergone a process of "cram." I don't use the word in any offensive sense. Considering the quality of the material upon which the private tutor has to operate, one can only wonder that so many pass, and that so few are rejected. A man who has mental food thrust into him by a pharmaceutical expert quicker than he can assimilate it, is to my mind crammed. Intellects differ, of course, and one man may, and sometimes does, pick up and assimilate more information in three months than another does in three years, but, speaking generally, quickly acquired knowledge is very evanescent. Even though a crammed man may scramble through the clutches of the examiners he gets little permanent good out of his ill-assorted meal; his superficial work soon takes wing, and he straightway forgets what manner of man he was.

I have by no means any desire to depreciate the services of the professional coach, usually intelligent

gent and smart, with whom patience must indeed be a virtue. In the present state of affairs the common is a positive necessity to many, and he supplies that for which there is, unfortunately, a demand. Before dismissing this question of examinations I should like to remind you that Mr. Martindale considers the Board ought not to be content with a merely theoretical knowledge of the metrical system of weights and measures, but that candidates should be required to show practical familiarity with their use. A recommendation to that effect was recently passed by the Council, but, to my surprise, the examiners did not see their way to adopt it. England is the only first-class power that has refused to adopt a rational system—almost ancient in Germany, France, and Austria—and still chooses to struggle on with her cumbersome, grotesque muddle of terms and quantities, none of which are a constant multiple of anything else. If it is reasonable to expect candidates to know anything at all about the metric system, surely we may reasonably expect that knowledge to be of a practical character, if it is to be of any use. We might as well content ourselves with theory in pharmacy, chemistry, or botany. It is the book pharmacist who bungles the emulsion, the expert at equations who puts borax into the pot, nit. drawer, and the theoretical botanist who makes inf. gent. co. with rad. belladonna. We all know these purely theoretical men, they "come from Sheffield." I need hardly say that this matter will crop up again, and, I hope, with more satisfactory results.

You need not be reminded that the Council has for the third time represented to the Privy Council the absolute necessity for adding carbolic acid to the Poisons Schedule. However, that august body, I regret to say, in the fulness of its wisdom, has not seen fit to acquiesce. You are aware, too, that the Council is quite powerless in the matter, and can make no alteration or addition to the Schedule without the authority and consent of the Privy Council. That body has been fully informed, it has been conclusively shown, that more deaths are caused by carbolic acid than by any other poison now included in the Schedule. The number of accidental poisonings has increased, and recommendations from coroners and juries are becoming quite frequent. I know that wisdom percolates very slowly into the brain of the permanent official, "who moves in a mysterious way" and is not altogether as other men, but public opinion cannot much longer be resisted, nor can public safety be much longer ignored. In the meantime we can only go on with our periodical applications, each one of which becomes stronger and stronger with accumulated evidence of urgent necessity and disaster. The only reason vouchsafed for refusing to schedule carbolic acid is—that being so much in popular demand public convenience would suffer, and that any restriction placed upon its sale might be especially harmful whilst epidemics were prevalent, when disinfectants should be easily obtainable. Under the circumstances you will see the little use asking that mineral acids shall be included in the Schedule. Yet the careless way in which these acids are distributed to the public would fully justify their inclusion.

A somewhat singular omission occurs in the Poisons Schedule as it now stands, and is one of many instances that might be quoted to show the

necessity for its entire revision. Cantharides and all fluid vesicating preparations of it are included. This does not, however, include cantharidin, which, therefore, may be sold without let or hindrance by anyone who chooses.

You will have noticed that an unsuccessful attempt has been made by Mr. Hampson and others, including myself, to make some decided alterations in the system by which applicants for annuities from the Benevolent Fund are elected.

It is at present the duty of the Benevolent Fund Committee to select from the applications made such cases as appear to be thoroughly deserving and eligible. A list of these is presented to the Council for confirmation, and becomes a "list of approved candidates." The number is quite arbitrary, and is nearly always in excess of the number of annuities for disposal. The result is a sort of scramble, which is anything but edifying. A postal canvass is instituted by people in the most destitute circumstances. The candidate who is too poor to expend a considerable amount of money, and is without influential friends to push his case, has little chance of success, at any rate in the first instance. On the other hand, the candidate who is really better off in possessing powerful friends who spare neither labour nor expense, quite probably heads the poll, though he may never have contributed a fraction to the Fund.

Mr. Hampson suggests as a remedy that, instead of compiling a long list of approved candidates, the Committee should select only a number corresponding with the actual number of annuities to be conferred, in other words, that the candidates deemed most eligible should be elected. If the Committee is to be trusted in selecting, say seven or eight out of ten or a dozen applicants, I cannot see why it could not go a step further and select three or four, as the case may be, out of the seven or eight.

This would mean taking the election completely out of the hands of members of the Society and subscribers to the Fund, and placing it entirely in those of your Executive. How far this may be wise is, of course, open to discussion. A large majority of the Council, though agreeing with us on the question of principle, voted against Mr. Hampson's motion on the ground that taking the election out of the hands of the subscribers themselves would injuriously affect the inflow of subscriptions—that is to say, the Benevolent Fund would suffer.

The Benevolent Fund is a splendid institution, conducted on most democratic lines, most economically and, may I say, lovingly managed. Members and non-members, subscribers and non-subscribers are all equally eligible to participate in its benefits, the only test being that of poverty and merit. It has been of incalculable benefit to scores and scores of our less fortunate brethren, "broken with the last straw," and down in heart as well as estate. This Fund has indeed strong claims on sympathy and support.

In April last the Law and Parliamentary Committee asked for authority to introduce into Parliament a Draft Bill, called The Pharmacy Act Amendment Act, 1894. The object was to render every person whose name appears on the Register of Chemists and Druggists eligible as a member of the Society, to make students associates, and to

provide for the retirement of one third of the Council every year by rotation instead of ballot. This proposal was met by an amendment from Mr. Harrison to the effect that it was not expedient to attempt further legislation until the whole question could be considered.

The Bill claimed to be nothing more than a step in the way of consolidation, and it was unanimously admitted that the introduction of controversial matters at the present time would be utterly futile. Discontent has been expressed as to the constitution of our Society. Time after time it has been urged that there should be perfect equality between pharmacist and chemist and druggist members, and that membership of Council should be as possible for one as for the other. For all this the proposed Act provided, but with the restriction that the Council shall not at any time contain more than ten members who are not pharmaceutical chemists. This restriction seemed to me most desirable and reasonable, yet, notwithstanding its distinctly broad and democratic nature, it has met with a good deal of opposition. The suggested change in the method of retirement of seven members of Council each year, by rotation instead of ballot, is very desirable. Under the present system, a member who is only just beginning to feel his feet, as it were, is liable to be thrown out by the chances of ballot, after only twelve months' experience. Under the proposed system he would be safe for three years, during which time he would have a fair opportunity to justify his election. There is, moreover, something decidedly objectionable in the "ballot," it smacks too much of the lottery and bazaar, too much of "pitch and toss," and really is a little undignified.

Another objection was that the Bill made no provision for exemption from jury service, but this was designedly omitted as certain to provoke opposition. Opinions differ, even on the jury question. Whilst one bemoans his liability, Mr. Martin considers that he is at a disadvantage in being disqualified by Act of Parliament from jury service; at the same time he thought exemption should be granted to the chemist who desired it.

Though myself exempt, and very much too human not to appreciate my good luck, I am strongly of opinion that exemptions are already far too numerous. Ministers, magistrates, lawyers and their chief clerks, doctors, civil servants, military men and officers, town councillors, dentists, surgeons and many others, including pharmacists, make up an enormous number (chiefly belonging to the educated classes) of exemptions. It is hardly fair to leave such important work as jury service to the ill-informed and illiterate, and then find fault, as we often have to do, with idiotic verdicts, which are an outrage on common sense. Yet I perfectly understand that exemption is much wished for by chemists and druggists, many of whom are sometimes put to extreme inconvenience by the receipt of the Queen's writ, and I should certainly vote for and support any measure which gave the exemption desired, quite irrespective of my own personal feeling in the matter.

The amendment was lost, and a resolution carried unanimously that the Bill should be proceeded with when, in the judgment of the Law and Parliamentary Committee, the time and circumstances seemed propitious. When such a time may be

expected is difficult to surmise; at any rate the present moment does not seem to invite experiments in that direction. The Bill is simply one of "consolidation"; it makes no pretence to be anything more, it makes no provision for the burning questions that occupy the mind of the aggrieved chemist, but it is suggested that it would improve our influence materially with the younger generation, who, as the President has stated, are at the present moment the greatest supporters of the Society. From that class there would very probably be a considerable increase in the fighting power of our institution, paving the way for better things, and that would be a step in the right direction. It seems to me a right and proper thing, in accordance with the democratic spirit of the age, to extend and amplify the pharmaceutical franchise, whether the newly enfranchised exercise it in the best possible manner or not.

We all know what a popular Pharmacy Bill would be like. A single clause, making it impossible for seven men to do what is illegal for the individual, would content the most exacting of our body. That is not more than would be fair and reasonable, but it is, I fear, much more than we shall obtain, at any rate for a long time. It is absolutely settled that what we know as company trading is legal. To say that such a ruling is in complete discord with justice and common sense, is only another way of saying that the thing was settled by the House of Lords; nevertheless, settled it is. Possibly our chance will come when that asylum of antiquated obstructives is improved off the face of the earth.

Before leaving this matter, let me remind you, in justice to some good men now no longer with us, that the Pharmacy Act of 1868 is not what the original promoters wanted and worked for. The Pharmacy Act, 1868, was the compromise forced upon them by a powerful outside opposition. To that unwise opposition, and to the Widows Clause, we owe company trading.

If a dead chemist may carry on business by putting a qualified man in charge, why may not a live grocer, or seven grocers, do the same? That is just the argument which has been used, and with great effect.

If ever the introduction of a Pharmacy Bill is attempted, with the serious intention of abolishing company trading, chemists will do well to make up their minds that they will have to relinquish the Widows Clause. It could not reasonably, logically, and honestly be retained, and it has already done us an immense amount of harm.

When we can present to the House of Commons a rational, workable Bill, dealing in a business-like manner with education, curriculum, consolidation, and company trading—when we can show that such a Bill is backed up and supported loyally and enthusiastically by every chemist on the Register, and not simply by the few who belong to the Society—then, and not until then, shall we deserve success and possibly attain it.

Probably in no other occupation is there such want of internal organisation—such utter neglect of existing facilities for combined action in the interests of the entire body. The advantages in this respect offered by the Society, both for purposes of protection or defence, could not well be surpassed, and yet only a paltry proportion of qualified

chemists have recognised that membership offers possibilities of self-government and trade protection such as the adherents of few occupations have at their disposal. To quote from the *Pharmaceutical Journal* of April last:—"It is a common mistake to regard the Pharmaceutical Society as a body which governs the trade, although the majority have no connection with it, and probably no small portion of the hostile feeling entertained by some is based upon that misconception as much as upon the circumstance that the Society is entrusted, on behalf of the public as well as the trade, with the duty of testing the qualification of persons desirous of obtaining legal qualification."

Need I say that such an idea is altogether erroneous. There is, of course, a vast power of government vested in the Pharmaceutical Society, but that power can only be exercised by the members of the Society, and its capability of governing the trade will consequently be greater or less in exact proportion as its membership is co-extensive with the number of chemists on the Register. In other words the machinery of the Society is especially designed to provide for self-government, and to say that the Society has neglected to do this or that for the benefit of the trade, is only another way of saying that the majority of chemists have chosen to neglect every opportunity offered them to take action in their own interests. It is in their power to completely alter the Society and its doings, whenever the trade chooses to combine and work for that particular purpose.

Those who read their trade journals cannot fail to have noticed with what vigour and energy the multitude of law-breakers who have found it pay to violate the provisions of the Pharmacy Act have been sought out and prosecuted. This is a matter upon which the Society may be congratulated, as well as upon the fact that, with very few exceptions, the prosecutions have been thoroughly successful. Practically the contest is over—no persons other than registered chemists and druggists may sell proprietary medicines containing an appreciable quantity of poison, and it has been laid down very emphatically that one-tenth of a grain of morphine in an ounce mixture is, in the eyes of the law, a poisonous preparation.

Since the law has been clearly defined as to the distinction between the old and almost obsolete patent articles, which are few and unimportant, and the ordinary run of proprietary medicines, whose name is legion, there have been several bare-faced and impudent attempts to evade the provisions of the Act by endeavouring to secure "patents" for nostrums containing scheduled poisons, and in this way legalising their sale by unqualified persons. The Council has been extremely alert to this very obvious trick, and, I am glad to say, by its promptitude and firmness has succeeded in rendering these attempts abortive. So far, every such patent applied for has been withdrawn or revoked.

Since the Society has for two or three years been contending, with almost invariable success, that many proprietary medicines now before the public, are in the meaning of the Act, "poisons," seems only reasonable, logical, and indeed necessary that these nostrums should be labelled as such—every bottle or package should have on

the word "poison." I am sorry to say there is a considerable amount of laxity in this particular, and it is quite within the range of possibility that, before long, you may hear of action being taken under the 17th section of the Pharmacy Act.

That section provides that it is unlawful to sell any poison unless it is distinctly labelled with the word poison, and the name and address of the seller attached. It is worthy of note that this applies to wholesale, as well as retail transactions. We have all need to be keenly on the alert concerning the sale of poisons. It should never be forgotten that it is the very essence of a chemist and druggist's business from a legislative standpoint. It will be well to realise that except for that provision there would never have been any registration at all, much less anything approaching to legislative protection. It is undoubtedly our duty in the interests of the public, as it is distinctly in the interests of chemists themselves, that we should jealously maintain our rights and privileges in this respect with constancy and vigour.

To some extent my remarks this evening may be regarded as a sort of stewardship account, presented for your consideration and possible disapproval, but at any rate I have furnished you with sufficient subject matter to discuss.

Much of the Council business, indeed the greater portion of it, is purely routine in character, and sometimes, perhaps, a little monotonous; on the whole, however, the work is distinctly pleasant and interesting. There are, naturally enough, sometimes differences of opinion, but we are emphatically respectable. Courtesy invariably prevails, and never does the tone of debate degenerate to the level of modern parliamentary rhetoric, or town council oratory. As a new member, full of the mental crudity, which comes, I am told, of inexperience, I have good reason to be grateful for the kindness and forbearance always extended to me.

One of the subjects that occupied the attention of the Council at its last meeting was a note containing certain suggestions affecting the Manchester Scholarship, and, as you already know, it met with handsome treatment. Surely the young men of Lancashire and Cheshire will not imperil the existence of this Scholarship by further indifference as to its great value and usefulness. If eventually the Scholarship should be withdrawn and the fund devoted to some object or purpose where the kindness of the donor will be better appreciated, the apprentices of this district will have to bear the blame of their own unaccountable blindness and folly.

In conclusion, and in anticipation of your criticism, let me suggest that it serves no good purpose to rake up mistakes and omissions of a quarter of a century ago, unless, indeed, it be to learn a lesson therefrom. "Sufficient unto the day is the evil thereof." We live in the present and in the immediate future. There is work enough to do, and work enough for all, "though the labourers are few," and I may say without presumption that the Council can be relied upon to discharge its legitimate share conscientiously and intelligently.

(The discussion on this address will be found at page 409.)

Pharmacy Act, 1868.

RECTIFICATION OF THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS.

We are requested by the Registrar to publish the following list of persons whose names will be erased from the Registers unless they communicate with him on or before December 30 next.

Those marked () are Pharmaceutical Chemists.*

Ablington, Leonard Yates ..	London Road, Newcastle-under-Lyme.	Clark, Alexander Gibson ..	28, M-lville Terrace, Edinb.
Ackerman, Henry	480, Commercial Road, Landport.	Clark, Shadrach	38, Bridge Street, Warrington.
Addison, Robert	2, Oxford Place, Castle Road, Scarborough.	*Clarke, Arthur Henry	Wantage.
Agger, Joseph Edward	4, Eldon Street, Barnsley.	Cobden, Alfred George	The Infirmary, East Dulwich Green, London, S.E.
Akhurst, William Edward ..	33, High Street, Peckham, London, S.E.	Coke, Richard Sweet	114, Fore Street, Devonport.
Alexander, Adam Rankine ..	52, Main Street, Newton, Ayr, N.B.	Cole, William	263, Manchester Road, Bradford, Yorks.
Allbridge, William	89, Summer Lane, Birmingham.	Coley, William Henry	71, Beech Avenue, Sherwood Elm, Nottingham.
Allbridge, Wm. Edward	59, Summer Lane, Birmingham.	Collier, William, jun.	79, South Street, Sheffield.
Allen, George	Pinhead, Dyssart, Fifeshire.	Collins, Richard Pugh	86, Well Street, South Hackney, London, N.E.
Allport, Henry Phillips	6, Snow Hill, Birmingham.	Colman, William	45, Percival Street, Chorlton-on-Medlock, Manchester.
Allport, Samuel	6, Snow Hill, Birmingham.	Cook, Robert	3, Cowan Street, Hillhead, Glasgow.
Amery, John	10, Nevill Street, Southport.	Cooke, Charles Samuel	Longfleet, Poole, Dorset.
Amphlett, Edmund	8, Malchacon Street, Worcester.	Cookson, Joseph	115, Bridge Street, Bradford, Yorks.
Andrews, George James	Bendon Villa, Bendon Valley, Wandsworth, London, S.W.	Cooper, John Henry	213, Marylebone Road, London, N.W.
Andrews, John William	68, Powis Street, Woolwich, London, S.E.	Cooper, John Thornhill	62, Denmark Road, Greenhay, Manchester.
Appleyard, Francis Henry ..	76, Lambeth Road, London, S.E.	Coppock, Henry Jones	East Street, Bridport, Dorset.
Aston, James Jevons	9, Bull Ring, Birmingham.	Corder, Ebenezer Porter	2, East Terrace, West Ham East, London, E.
Bagshaw, Charles	9, Halifax Road, Rochdale.	Cotter, Cornelius	62, Culvert Road, Battersea Park Road, London, S.W.
Bail, Edwin	Wallgate, Wigan.	Cox, Edmund George	244, Kennington Road, London, S.E.
Banks, Edward Cundell	7, Fairbridge Street, Middlesbrough-on-Tees.	Cragg, Thomas	2, Victoria Villas, Chestnut Road, Tottenham.
Barbor, Daniel Stone	126, Alderney Street, Pimlico, London, S.W.	Crocker, Thomas Basley ..	63, Hill Park Crescent, Plymouth.
Barcham, Henry	High Road, Stamford Hill, London, N.	Crooke, Charles Gibbins ..	New Meeting Street, Birmingham.
Barker, Charles Dexter	76, Turnmill Street, London, E.C.	Crossland, George	111, Brierley Street, Stalybridge.
Barron, Alexander	8, Neville Street, Southport.	Cubitt, Charles	Adelaide Square, Bedford.
Bates, William	26, St. Andrew's Square, Hastings.	Cupples, Thomas	Stanstead Abbots, Herts.
Bell, George	Townhead, Lockerbie, N.B.	Cuthbertson, James	Darvel, Ayrshire.
Bell, Henry	51, High Street, Gosforth, Newcastle-on-Tyne.	Dauncey, George	80, Wigmore Street, London, W.
Bell, William	12, Geneva Road, Seacombe, Cheshire.	*David, John	Swansea.
Bellerby, Michael	25, Shield Street, Newcastle-on-Tyne.	Davies, Ellis Thomas	Caerwys, Flint.
Bence, Frederick Herbert ..	14, The Beacon, Exmouth.	Davies, John Twister	Caerwys, Flint.
Bishop, Thomas	Bosnes, Llanthwysfa.	Davies, Thomas	47, Albert Edward Road, Liverpool.
Black, Charles Jeffery	4, Braid Place, Newington, Edinburgh.	Davies, Thomas William ..	89, Shenley Road, Camberwell, London, S.E.
Bladon, William George	Blackmoor House, Malvern Wells.	Davies, William	54, Broad Street, Hereford.
Bolton, Edgar Benjamin	8, Upper High Street, Winchester.	Davis, Ifor	Castle Road, Roath, Cardiff.
Bond, Peter Gillard	18, Tavistock Street, Bedford Square, London, W.C.	Dawson, John William	94, High Street, Lincoln.
Bowen, James	44, Thorne Road, Clapham, London, S.W.	Day, Charles Estcourt	632, Old Kent Road, London, S.E.
Bowler, Samuel	332, Deansgate, Manchester.	Denton, Charles Hughes ..	1, Booth's Yard, St. James's Road, Halifax, Yorks.
Bowler, Samuel John	42, Gt. A. C. c. Street, Manchester.	Devereux, Arthur James ..	Beaconsfield, Bucks.
Bowron, John	Brunswick Square, Penrith.	Dixon, Franklin	Ferncliffe, Middles.
Bradley, Edward	13, St. Ignatius Square, Preston.	Dodgson, William	5, Lower Street, Stockton-on-Tees.
Bradley, John	8, Nurwood Street, Spring Bank, Hull.	*Dowdeswell, Jonathan ..	1, Queen's Road, South Wimbledon, Surrey.
Breese, Thomas	Cathedral Close, Norwich.	Down, Elgar	55, Harleyford Road, London, S.E.
Brend, Kenneth Benjamin ..	41, St. Helen's Road, Swansea.	Draper, Arthur Longfellow ..	10, Lorne Street, Leith Walk, Edinburgh.
Brett, Frederick John	King Street, Leicester.	Draper, Henry Foulger	High Street, Chippenham, Wilt.
Brice, Ernest	20, Newark Street, Leicester.	Dring, William	St. Neots, Hunts.
Bromfield, John Pidgeon ..	Honiton, Devon.	Drummond, George	Edinburgh.
Brown, Angus Sinclair	67, Nelson Street, Great Grimsby.	Eades, John Westmacott ..	80, Camberwell Road, London, S.E.
Budgett, Arthur Edward ..	6, Wellington Street, Strand, London, W.C.	Elam, Benjamin	196, Oxford Street, London, W.
Budgett, Charles Stevens ..	2, Greyhound Place, Streatham, London, S.W.	Elliott, George Henry	99, North Road, Plymouth.
Bullock, Robert	Buckhurst Hill, Essex.	Ellis, William	Adderbury, Oxon.
Burdett, Edgar	130, Petre Street, Sheffield.	Ellis, William	89, Exchange Street, Sheffield.
Burge, Samuel	79, Fore Street, Exeter.	Evans, Arthur Edwin Sharp ..	137, Tufnell Park Road, London, N.W.
Burrell, John Benjamin	77, High Street, Croydon.	Evans, David	79, Abbey Road, St. Johns Wood, London, N.W.
Bussell, Henry James	125, High Street, Burton-on-Trent.	Fallowfield, Jonathan	36, Lower Marsh, Lambeth, London, S.E.
Butterfield, Richard Brigham ..	16, East Parade, Haworth Road, York.	Fenny, John	Stockton-on-Tees.
Butterfield, Thomas Alexander ..	53, High Street, Sutton, Surrey.	Fenton, William	17, Fulham Road, London, S.W.
Caldwell, John	4, Elinwood Avenue, Belfast.	*Ferguson, William Kennedy ..	7, Townsend Road, Lansdowne Road, Tottenham.
Carter, Frederick Paul	Victoria Drug Hall, Montreal, Canada.	Fieldsend, John Francis ..	8, Southgate Place, New Southgate.
*Chabot, Frank	70, Prescott Road, Fairfield, Liverpool.	Fitton, Robert	80, New Street, Huddersfield.
Chappelow, Thomas Henry ..	Seaford Cottage near Worksop.	Flawitt, Charles Thomas ..	Mottingham

- Greenhill, James Donaldson Randolph Street, Buckhaven.
 Griffiths, John Wilmot 1, Rathbone Street, Barking Road, London, E.
 Hadfield, John Hurst Walton-le-Dale, Preston, Lancs.
 Hanbury, William 49, Park Lane, Norwich.
 Hands, Ernest Yildfield Hall, near Walsall.
 Harries, David 37, Trinity Square, London, S.E.
 Harrington, Richard Beau 161, Denmark Street, Radford Boulevard, Nottingham.
 Harris, Waddelow Chambers 17, Eekstein Road, Clapton Junction, London, S.W.
 Harrison, James Deptford House, Sunderland.
 Harrison, John Burtgill, Warcop, Westmoreland.
 Harrison, Thomas Nicholson 9, Ashgate Road, Broomhill, Sheffield.
 Hartley, Thomas 25, Westbourne Terrace North, London, W.
 Hartwood, Thomas Henry New Quay, Cornwall.
 Haworth, William 22, Victoria Street, Blackpool.
 Healy, Arthur 9, Bull Ring, Birmingham.
 Henderson, Christopher 19, Woodchurch Lane, Birkenhead.
 Heron, Frederick Chambers 40, Southampton Buildings, London, W.C.
 Hick, Henry 136, Bockett Street, Leeds.
 Hicke, Henry John 3, High Street, Horncastle.
 Hill, John Thornhill, Yorks.
 *Hilton, Ivor Ajax Robin 52, Ivanhoe Road, Denmark Park, London, S.E.
 Hine, Alfred Ernest 9, Manley Terrace, Kennington Park, London, S.E.
 Hodgkinson, Peter James 50, Bold Street, Alexandra Road, Moss Side, Manchester.
 Hogg, George 41, Marchmont Crescent, Edinburgh.
 Holt, James Hartley 58, Sandy Lane, Skelmersdale.
 Holtham, Charles 2, Westminster Chambers, London, S.W.
 Honeyman, Edmund 104, Dalry Road, Edinburgh.
 How, William 52, South Street, Dorchester.
 Howell, Evan John 23, Telephone Road, Southsea.
 Howell, Walter Septimus 70, Herbert Road, Plumstead, London, S.E.
 Hubbard, John 13, St. Ann's Road, Brixton, London, S.W.
 Hudson, John William 25, Jennings Street, Hull.
 Hulley, John 97, Manchester Road, Heaton Norris, Lancs.
 Humphreys, Thomas Henry Rhin Smith 106, Fenchurch Street, London, E.C.
 Hurry, James Henry St. Mary's Street, Bungay, Suffolk.
 Hutchinson, George Pottery Lane, Forth Banks, Newcastle-on-Tyne.
 Inglis, James 8, Cumberland Street, Edinburgh.
 Innes, James 4, Steels Place, Edinburgh.
 Jackson, David Middleton Junction, Chadderton, near Oldham.
 Jacobs, William Henry 100, Newtown Row, Birmingham.
 James, Alfred 162, Bow Road, London, E.
 *James, Charles Frederick 5, Star Street, Paddington, London, W.
 James, Henry Arthur 6, Crozier Street, Westminster, London, S.W.
 James, William High Street, Hucknall Torkard, Nottinghamshire.
 Jeanes, George 12, Emily Terrace, Putney.
 Johnson, Samuel 67, St. Mary's Terrace, Manningham, Bradford.
 Johnstone, David 30, Dale End, Birmingham.
 Johnstone, Donald Forbes 33, St. Patrick Square, Edinburgh.
 Johnstone, William Hope 149, Shields Road, Byker, Newcastle-on-Tyne.
 Jones, Walter Robert Parish Offices, Edmund Street, Birmingham.
 Joy, Francis John Jessopp Cardiff.
 Jubb, William Officer 80, Queen Street, Hull.
 Juler, Richard Roan 43, Fowls Street, Woolwich, London, S.E.
 Keane, Edward 31, Stall Street, Bath.
 Keith, Albert William 25, Haddington Place, Edinburgh.
 Kemp, John 7, Park View Terrace, Stanford Road, Brighton.
 Kemp, William 81, Inkerman Terrace, Belfast.
 Kendrick, Alfred 47, City Road, London, E.C.
 Kent, Edward 59, Wood Lane, Shepherds Bush, London, W.
 King, Robert 91, Caledonian Road, London, N.
 Kirkby, Robert Serpentine Road, Kendal, Westmoreland.
 Kitching, Samuel 6, Prospect Street, Hull.
 Knight, Angus Arthur 4, Repton Street, Manchester.
 Knowles, Richard 80, Newton Street, High Park, Southampton.
 Lambert, Thomas 10, Ashton New Road, Bradford, near Manchester.
 Lane, William 288, Holloway Road, London, N.
 Law, James 41, Stone Street, Maidstone.
 Lawson, Edward James High Street, Whitstable.
 Lear, George Hill 373, Coventry Road, Birmingham.
 Lees, John 13, Columbia Place, Clydebank, Glasgow.
 Lester, Theodore Christopher Hull.
 Lewis, Edward 37, Egerton Street, Chester.
 Lewis, Edward 21, Woodchurch Lane, Prenton Road W., near Birkenhead.
 Lewis, Henry Thomas Alcester, Warwickshire.
 Lewis, Richard George 84, Powis Place, Aberdeen.
 Livesey, William 52, Ranelagh Street, Liverpool.
 Llewellyn, Thomas 300, Bute Street, Cardiff.
 Lloyd, Frederick Ruggie Suffolk Lane, Upper Thames Street, London, E.C.
 Lodge, Arthur William 26, West Street, Horsham.
 Low, Joseph 280A, Commercial Road, London, E.
 Lowe, Walter 22, Brighton Street, Manchester.
 Lucas, Isaac 13, Plymouth Street, C-on-M., Manchester.
 McConnal, Alan Appleby, Westmoreland.
 McGill, Roderick 49, Thistle Street, Glasgow.
 McKenzie, James 20, Roseweath Place, Edinburgh.
 Macpherson, Mary Crich, Derbyshire.
 McVitie, John Brough 97, Sauchiehall Street, Glasgow.
 Malcolm, Alexander 18, South Frederick Street, Edinburgh.
 Male, Trevan Bersey 12, Endsleigh Place, Plymouth.
 Manning, Hannah London Road, Tickenham, Middlesex.
 Marshall, Arthur Willis 160, Upper Brook Street, Manchester.
 Marston, Samuel 278, Belgrave Gate, Leicester.
 Masters, George Cheesman 17, Albion Road, Lewisham High Road, London, S.E.
 Maw, Solomon Gervas 189, Fitzwilliam Street, Sheffield.
 Mellor, John 134, Petre Street, Ellsmere Road, Sheffield.
 Meynell, John Wicks Moor, near New Mills, Cheshire.
 *Miller, Thomas 19, Bernard Street, Leith.
 Mitchell, Charles Edward 18, Rose Street, Bolton.
 Monkton, George Joseph 7, Line Terrace, Canhall Road, Leytonstone.
 Moon, George Mapperley, Derbyshire.
 Moorhouse, Edward Dobson 153, Chester Road, Hulme, Manchester.
 Morgan, Edward 17, Wheeler Street, Leeds.
 Morris, John Friar Street, Worcester.
 Mortimer, Henry Thomas 24, St. Nicholas Street, Leicester.
 Muir, George McCartney He'naburgh.
 Murch, Edward 13, Park Street, Brighton.
 Murphy, Thomas Higher Bridge Street, Bolton, Lancs.
 Murray, Alexander 27, Cromwell Street, Stornoway, Ross-shire.
 Murray, John 14, Douglas Terrace, Edinburgh.
 Nairne, Charles 228, High Street, Perth.
 Newton, Thomas 41, Hedon Road, Hull.
 *Nicholls, Reginald Edward 44, St. Pauls Road, Highbury, London, N.
 Nield, Richard 40, Fern Acre Terrace, Cheetham Hill, Manchester.
 Norriah, George 91, Clarendon Road, Notting Hill, London, W.
 Notcutt, William Brighty Church Road, St. Leonards-on-Sea.
 Nutman, George Robert 25, Welford Road, Leicester.
 Owen, James 103, Bloomsbury Street, Birmingham.
 Owles, Thomas 16, Sloane Street, Manchester.
 Parkin, George Anthony 8, Micklegate Bar Without, York.
 Parkinson, Charles Melita Villa, Mornington Road, Leytonstone.
 Parks, Henry 137, Horninglow Street, Burton-on-Trent.
 Parry, Alfred 18, Prince Regent Lane, Barking Road, London, E.
 Parry, Marian 3, Clarence Road, Bristol.
 Parry, Thomas Jones Ebenezer, Carnarvon.
 *Pasnin, Thomy Mauritius.
 Pater, Joseph Brewster Heathville Road, Gloucester.
 Paul, Andrew 39, Abercorn Street, Glasgow.
 Peach, Edward 13, Webber Road, Blackfriars, London, S.E.
 Peake, Charlotte Bedworth, Warwickshire.
 Peat, William Henry 46, Stamford Street, London, S.E.
 Percival, Thomas 20, Paterson Street, Glasgow.
 Peterkin, James 13, Cal'n Street, Edinburgh.
 Phillipson, Frederick E. 10, Fildes Street, Corporation Road, Great Grimsby, Lincs.
 Pike, Charles Brixham, Devon.
 Platt, Charles Rowley 4, Bolton Street, Piccadilly, London, W.
 Porter, Clement William Terrace, Harpurhey, Manchester.
 Porter, Thomas William Preston, Lancs.
 Prisco, John 11, Jonson's Place Harrow Road, London, W.

- Price, John Rhys High Street, Chippenham, Wilts.
 Price, Thomas Uloek 81, Mallinson Road, Capham Junction, London, S.W.
 Frotheroe, Francis Richard Henry Lydney, Gloucestershire.
 Quarmby, Thomas William Leyland House, Wexham.
 Rackham, George Wenbaston, Halesworth, Suffolk.
 Radcliffe, Robert C. ygil Abernaw Villa, Chestnut Road, Tom Moseley, Birmingham.
 Rastrick, George Thomas Geoloe, Victoria, Australia.
 *Rastrick, Robert Joseph 87, Gloucester Street, Belgrave Road, London, S.W.
 Richards, John Maentwrog, Merionethshire.
 Richards, Richard Henry 866, Albany Road, Camberwell, London, S.E.
 Richardson, James 87, Queen Street, Port Elizabeth, Cape Colony.
 Ridley, Henry 156, Newgate Street, Newcastle-on-Tyne.
 Ridley, Joseph Whittle 156, Newgate Street, Newcastle-on-Tyne.
 Rigby, James 8, Mount Pleasant, Waterloo, Liverpool.
 *Riley, Charles Reynolds Elm Tree Lodge, South Lambeth Road, London, S.W.
 Ring, Edward James 21, Springfield Road, St. John's Wood, London, N.W.
 Roberts, Anthony Tucker 21, Buckingham Road, Brighton.
 Roberts, Charles Marsden, near Huddersfield.
 Roberts, Robert 185, Upper Hill Street, Liverpool.
 Roberts, Thomas Aneurin Conway, Carnarvonshire.
 Robertson, Donald Bervie, Kincardineshire.
 Robertson, George Smith 17, Dundas Street, Edinburgh.
 Birrell 139, Princes Street, Edinburgh.
 Robertson, James Dalgety Prospect House, Corbridge.
 Robson, Matthew 13, Rosevale Street, Partick, Glasgow.
 Ross, William Neil 19, Cardwell Street, Bolton.
 Rostron, William 241, Hyde Park Road, Headingly Leeds.
 *Rowell, John George 26, Barbby Street, West Ham, London, E.
 Rowlett, Thomas Charles 105, Bow Road, London, E.
 Sadler, Thomas Barnack, Northamptonshire.
 Sanderson, James Boyer 71, Parade, Birmingham.
 Sanderson, Thomas 2, Parade, Northampton.
 Saul, William Benjamin 20, Eden Street, Oldham.
 Schofield, Samuel Woodale Pl., Provost Road, Dundee.
 Scoot, Henry Fife 16, Bristol Place, Edinburgh.
 Scroggie, John Henderson 11, M'crieff Terrace, Edinburgh.
 Scatter, William Charlbury, Oxon.
 Season, Robert 4, Braid Place, Edinburgh.
 Shad, James Sellar 207, Great Lister Street, Birmingham.
 Sherlock, James Town Clock House, Gosport, Hants.
 Simpson, Samuel Market Square, Buckingham.
 *Sirett, George Beynon 118, Long Acre, London, W.C.
 Slade, Thomas Bates 82, Martin Street, Leicester.
 Slater, Joseph 27, Union Street, Ryde, I. of W.
 *Smees, Walter Wallis 22, St. Leonard Street, Edinburgh.
 Smith, Andrew Lees 15, Abbotsford Place, Glasgow.
 Smith, Catherine Love Brook Street, Derby.
 Smith, Charles Albert 55, Myrl Street, Liverpool.
 Smith, John 7, High Street, Runcorn, Cheshire.
 Smith, Peter 8, Greenway Road, Corcoran Road, Bristol.
 Smith, Thomas Ipswich.
 Smout, Charles Hickford 18, Great Hampton Street, Birmingham.
 Snape, John George High Street, Dorking, Surrey.
 Solly, Stephen Francis The Green, Mortlake, London, S.W.
 Somers, Robert Walter Elm Tree Cottage, Burton Pidsae, Hull.
 Spencer, John 185, Gooch Street, Birmingham.
 Spencer, Robert 100, Whiteladies' Road, Clifton, Bristol.
 Spink, Harry Laing 84, Pittfield St., Hoxton, London, N.
 Speckley, George 55, King Henry's Walk, Mildmay Park, London, N.
 Stapleton, William Waller Sheffield, Beds.
 Stead, John High Street, New Whittington, Derbyshire.
 Stead, Thomas Albert Formby, near Southport.
 *Steel, David 25, Lothian Road, Edinburgh.
 Steel, John Bridge Street, Kilbirnie, Ayrshire.
 Stevenson, David Archibald 2, Portland Villas, Addlestone, Surrey.
 Storey, Theophilus 7, Pilgrim St., Newcastle-on-Tyne.
 Strachan, John 14, Gullford Street, Russell Square, London, W.C.
 Strawn, Vincent 85, I-lington, Liverpool.
 Strickett, John High Street, Peckham, London, S.E.
 Stubbs, George Darlington.
 Stubbs, Tyson 175, High Street, Deal, Kent.
 Stuckey, William George 33, Ladbroke Grove Rd., London, W.
 Sturges, William Thomas 80, Shepherds Bush Green, London, W.
 Swift, Charles Edward Great Bridge, Staffordshire.
 Talbot, Hugh Sidmouth, Devon.
 Talbot, Thomas Henry 106, Fenchurch Street, London, E.C.
 Tate, John Lister Park Lane, Wakefield.
 Taylor, Joseph Walter Boston, Mass., U.S.A.
 Taylor, Arthur Bertie 27, Meeting-House-Lane, Peckham, London, S.E.
 Taylor, Benjamin 160, Briggate, Leeds.
 Taylor, Frederick Hayden St. James Street, Kings Lynn.
 Taylor, James Johnston 18, Duncan Street, Drummond Place, Edinburgh.
 Taylor, John 42, Walker Terrace, Gatehead.
 Taylor, Robert Scott 49, London Rd., H-eley, Sheffield.
 Thompson, Thomas 15, Rungate, Stockton-on-Tees.
 Tiffany, John William 85, Brunswick Street, Halifax.
 Tipper, Jonathan Edward High Street, Evesham, Worcestershire.
 Todd, Levi 154, Moss Lane East, Manchester.
 Tozer, Frederick Early Chestnut Villa, Addlestone, Surrey.
 Trounson, Francis 1, Morrib Terrace, Penzance.
 Truscott, William Hearle 70, New Bond Street, London, W.
 Tuck, William James Sultan Road, Portsmouth.
 Tupholme, John James The Terrace, Spilaby.
 Tyas, William Henry 11, Diamond Place, Coldbath End, Harrogate.
 Tyrrell, Thomas Henry 24, Wellington Street, Luton, Beds.
 Urquhart, Roderick Edinburgh.
 Veitch, William 45, Harold Street, Burley Fish, Leeds.
 Waddington, Samuel Court House, Weaver, Walsley, Cheshire.
 Walker, John Callow 122, Lordship Lane, E Dulwich, London, S.E.
 *Walker, Joseph Be'grave Road, Dresden, Staff.
 Walklate, John Thomas Liverpool Road, Stoke-on-Trent.
 Wanless, Frederick Adolphus 16, Claremont Street, Manchester.
 Watson, Albert James 257, High Holborn, London, W.C.
 Watson, John Lichfield Road, Aston, Birmingham.
 *Watton, Edward High Street, Bromsgrove.
 Weall, George Alexander The Fosse, Leicester.
 Welch, Geo George Richard 8, Stanley Street, Southsea.
 Julians 5, High Street, Penicuik, N.B.
 Welsh, Thomas 34, Upper Jackson Street, Hales, Manchester.
 Wheeler, Alfred 9, Lower Market Street, Brighton.
 Whewell, William Edmund The Sheep Market, Market Harborough.
 White, Arthur James 14, Werrington Street, London, N.W.
 White, William Thomas 17, Kennington Road, London, S.E.
 Whitehead, John Warburton 88, Brunswick Street, Chorlton, Medlock, Manchester.
 Whitaker, William 7, High Street, Runcorn, Cheshire.
 Whitwell, Ann Thirsk, Yorks.
 Wilde, Francis London Street, Andover.
 Wilks, Robert Sheep Street, Skipton, Yorks.
 Williams, Evan David 161, New Cross Road, London, S.E.
 Williams, George 70, Ledbury Road, Baywater, London, W.
 Willison, William Henry 11, West Pembroke Place, Kent Court Road, Kensington, London, W.
 Wilson, George 8, Ebenezer Terrace, Enfield Town.
 Wilson, Joseph 9, Ivgate, Bradford, Yorks.
 Wilson, William Mainland Park Hill Villa, Church Hill End, Walthamstow.
 Wingrave, Joseph 4, High Street, Coventry.
 Winship, James 40, East Street, Southampton.
 Witherington, Thomas James 8, Foregate Street, Worcester.
 Witney, Frederick Harcourt 14, Spa Road, London, S.E.
 Wolfendale, Richard Tutbury, near Burton-on-Trent.
 Wood, Albert Edward 4, St. Catherine's Terrace, Borne-on-Sea, Hants.
 Wood, Benjamin 78, Northgate, Halifax, Yorks.
 Wood, William 78, Northgate, Halifax, Yorks.
 Woodstock, Charles Edmund Bradly Green, near Congleton.
 Wright, Harry 7, Commercial Buildings, Street, Bradford, Yorks.
 Wright, Joseph Pretty 154, Station Street, Burton-on-Trent.
 Young, Dixon 42, Maple Street, Newcastle-on-Tyne.
 Young, William Herbert 85 Baker Street, London, W.
 Younger, Robert Edward Northgate Street, Ipswich.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, NOVEMBER 17, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

THE ART OF PRESCRIBING.

THE decline in the art of prescribing among medical practitioners of the present day has frequently been discussed at medical and pharmaceutical meetings. The general opinion seems to be that it is due chiefly to two causes—the abolition of the old system of apprenticeship in medicine, and the expansion of the medical curriculum in various directions to the exclusion of pharmacy and materia medica. The opportunity of gaining an intimate knowledge of drugs formerly afforded during the period of pupillage is now replaced by a course of about three months' instruction in pharmacy enforced in a more or less perfunctory manner. At the same time the principles which underlie the proper exhibition of medicines are almost entirely omitted from the course of medical education, it being assumed that sufficient opportunity of acquiring the necessary knowledge is afforded during the time spent in attending hospital practice. This opportunity is, however, reduced to a minimum by the custom of prescribing and dispensing from a hospital pharmacopœia or formulary, the object being to save the prescriber's time and economise labour in the dispensary.

Persons familiar with the administration of hospital pharmacy, and aware of the staff usually provided, will appreciate the difficulty of coping with the amount of work involved in dispensing medicines for hundreds of patients daily. In the larger general hospitals three hundred or more out-patients will be sent to the dispensary from the various consulting rooms during a period of about three hours: it is obvious that four or five dispensers would be unable to accomplish the work in the time available under such conditions as obtain in an ordinary pharmacy. The hospital phar-

macopœia, therefore, may serve a useful purpose in accelerating the serving of patients, by providing formulæ for the exhibition of certain more or less routine remedies for common ailments. The prescriber simply writes the name of the preparation, e.g., *mist. quin. cum ferro*, and states the dose; the dispenser then supplies the patient with the required quantity from a bulk previously prepared according to the formula in the hospital pharmacopœia. The prescriber also saves the time required for writing out the prescription in full, but this acts greatly to the detriment of medical education in prescribing. The students attending hospital practice see various mixtures, pills, &c., ordered merely by name, and frequently know neither the ingredients, doses, nor the means adopted to combine the constituents into a presentable form. To this want of knowledge many observers attribute the increasing use of nostrums and ready-made preparations in medical practice, and from this point of view the hospital pharmacopœia does considerable harm. If it be used too freely the medical student sees little or no real prescribing, and this deficiency in his education oppresses him throughout his after career as a medical practitioner.

The abolition of the hospital pharmacopœia altogether would no doubt do much to promote a better state of affairs, but this would necessitate the increase of the dispensary staff to such an extent that the hospital authorities would hesitate to sanction the change, involving, as it would, a considerable increase of expenditure. If the hospital authorities could be induced to face the increased cost of dispensary administration, it would be better for medical education that the prescribing and dispensing in our general hospitals should be rendered altogether independent of the use of the ready-made medicine, for which formulæ are given in hospital pharmacopœias. It may be maintained by some, however, that the hospital pharmacopœia, if embracing only the commonest remedies and therefore limited in size, may serve its purpose without, at the same time, crippling the teaching of prescribing in the hospital. Certainly, in hospitals for special diseases, which are usually attended only by qualified medical men, less harm is done by the use of a so-called hospital pharmacopœia, and the special form of medication required better justifies the use of medicine prepared according to specially constructed formulæ.

PHARMACEUTICAL MEETINGS.

SECRETARIES of pharmaceutical associations throughout Great Britain are requested to send early intimation of any meetings to be held in their respective districts, for publication in the "Diary of the Week." To ensure prompt attention all notices and reports should be received not later than Wednesday morning in each week.

PROFESSOR GREEN'S LECTURE.

The lecture, delivered by Professor GREEN on Wednesday evening, a verbatim report of which will be published in next week's Journal, opened with a definition of a nervous system, which was shown in its simplest form to be the means possessed by an organism either of originating movements, &c., by changes in its living substance without any external cause, or of receiving impressions from without and responding in some way to those impressions. A distinction was further drawn between the actual response and the transmission of molecular disturbance leading to it, or, in other words, between nervous and muscular or other visible mechanism. The nervous system essentially consists of three parts: one concerned in the communication to the organism of influences from without, the so-called afferent or sensory mechanism; one concerned in the production of the various efforts of the body, the efferent or motor nervous tracts; and a central one originating the latter, or co-ordinating this with the former. One of the simplest animals, *Amoeba*, and one of the simplest plants, *Aethalium*, were then compared and shown to have very similar arrangements in this respect. The chief importance of a nervous system was pointed out to be the placing of the organism possessing it in harmony with its environment, and enabling it to adopt itself to changes in the latter. The environment of the plant was briefly described, and its advantages and dangers sketched. The general sensitiveness of the plant was then discussed and illustrated, and its power of responding to external stimulation shown to depend on a certain condition known as "phototonus," which is easily disturbed, with serious results.

The question of the special sensitiveness of plants to particular forms of disturbance or stimulation was then examined in some detail. The susceptibility which plants possess was shown to be most easily manifested by movements of growing organs, though it is also seen in some adult ones, by movements, secretion, &c. By a series of instances it was shown that varying powers of appreciating light gave the impression of a rudimentary vision. The localisation of the power, and the nature of its manifestation were then examined, and the extreme sensitiveness of some plants pointed out. Similar powers of response to other forms of stimulus were then discussed, and various plants shown in different ways to be possessed of rudimentary powers of touch, taste, smell, and muscular sense, or sense of equilibrium. A rudimentary power of reflex action was claimed by Darwin for certain tentacles of *Drosera*. This was discussed and illustrated.

ALKALOIDS OF IPECACUANHA.

At the evening meeting on Wednesday, Dr. PAUL exhibited a number of specimens prepared dur-

ing the course of his work on the chemistry of ipecacuanha. These included emetine hydrochloride crystallised from dilute hydrochloric acid and water respectively, cephaline hydrochloride crystallised from weak hydrochloric acid, and several other exhibits illustrating the very different solubility of emetine and cephaline in water and petroleum spirit.

CHEMISTS' BALL.

A MEETING was held at 17, Bloomsbury Square, on the 5th inst., to make arrangements for the forthcoming ball. The following were elected to form the committee:—Mr. M. CARTEIGHE, Chairman; Professor JOHN ATTFIELD, Treasurer; Mr. A. J. PHILLIPS, Hon. Sec., 156, Cromwell Road, S.W., with Messrs. BOWEN, BREMERIDGE, T. H. FRANCIS, T. C. W. MARTIN, J. H. MATHEWS, A. J. MERRELL, A. C. PRESTON, J. STYLE, and JOHN C. UMNEY. It was decided to hold the ball at the Portman Rooms, on Wednesday, January 16, 1895, and circulars have been issued inviting gentlemen to act as stewards. Any who have not replied and may be desirous of having their names on the stewards' list will oblige the Honorary Secretary by communicating with him as soon as possible.

INVENTION OF LUCIFER MATCHES.

A MOVEMENT is on foot to erect a statue at Stockton-on-Tees to the inventor of lucifer matches, JOHN WALKER, a druggist in that town, who died in 1857. As mentioned in an article in the *Pharmaceutical Journal*, by Mr. BARNARD S. PROCTOR ([3], ii., p. 41), WALKER supplied prepared matches which were ignited by being drawn between the folds of a piece of sand paper. The matches consisted of thin slips of wood about 2½ inches long, and the thickness of cardboard, dipped in a composition containing antimony sulphide and potassium chlorate. They were sold in boxes of fifty with a piece of sand paper, at the price of one shilling per box.

THE PHARMACOPŒIA AS A STANDARD.

NOR the least important point in Mr. BOA's address to the Edinburgh District Chemists' Trade Association is his reference to the growing tendency to substitute for pharmacopœial preparations supposed "improvements" on these. The main object of having a national pharmacopœia is undoubtedly to secure uniformity in medicinal preparations, so that wherever a prescription is dispensed the product may be the same, and, whether or not a modified formula or process yields an improved article, pharmacists are not justified in adopting the modification generally unless, and until, it receives official sanction. Whilst there is every reason for endeavouring to ascertain methods by which better preparations may be obtained, there is no legitimate ground for ignoring the Pharmacopœia in respect of what it renders official.

RECTIFICATION OF THE REGISTER.

UNDER the Pharmacy Act of 1868, section x, the Registrar is authorised to keep a correct register of chemists and druggists, and to this end is empowered to erase the names of all registered persons who shall have died, and from time to time to make the necessary alterations in the addresses of persons registered under the Act. If, after the Registrar has sent two registered letters to any such person at an interval of six months, no reply be received, within three months of the date of the second letter it is lawful for him to erase that person's name from the Register. In the case of the individuals whose names are published in the list on pages 398-400 of the present issue of the Journal no replies have been received to the registered letters sent, and unless they communicate with the Registrar on or before December 31 next, their names will be erased from the Register accordingly. Divisional and local secretaries, and friends of any of the persons mentioned, are requested to assist in making the Register as accurate and complete as possible by attracting the attention of interested parties to the list, or furnishing such information regarding them as may be in their power to the Registrar, 17, Bloomsbury Square, London, W.C.

FORTUNES LEFT BY DOCTORS.

UNDER this heading the *Daily Telegraph* of Tuesday last gives some interesting statistics regarding the amount of personalty left by medical practitioners within recent years. Sir WILLIAM WITHERY GULL, who is said to have admitted that he had made over £13,000 in one year, left £344,023 in personalty; Dr. THOMAS RHODES ARMITAGE, £217,420; Sir ANDREW CLARK, £203,970; Sir OSCAR MOORE PASSY CLAYTON, £147,746; Dr. LAWRENCE TRENT CUMBERBATCH and Dr. GEORGE DIXON LONGSTAFFE, each £107,000; whilst fifty-five other medical men, who have died within the past five years, left sums varying from £88,401 to £2402, only five being below £10,000.

ROYAL SOCIETY ELECTIONS.

THE list of those recommended by the President and Council of the Royal Society for election into the Council for the year 1895, at the anniversary meeting on November 30, is as follows:—President, Lord KELVIN; treasurer, Sir JOHN EVANS; secretaries, Professor MICHAEL FOSTER and Lord RAYLEIGH; foreign secretary, Sir JOSEPH LISTER; other members of the Council, Dr. COMMON, Professor CROOKES, Professor DARWIN, Professor FORSYTH, Sir DOUGLAS GALTON, Professor ALEXANDER HENRY GREEN, Sir JOHN KIRK, K.C.B., Professor HORACE LAMB, Professor EDWIN RAY LANKESTER, Professor ALEXANDER MACALISTER, Professor JOHN HENRY POYNTING, Professor ARTHUR WILLIAM RÜCKER, Mr. OSBERT SALVIN, Professor BURDON SANDERSON, Professor THORPE, and WILLIAM HENRY WHITE, C.B.

MISCELLANEOUS NOTES.

THE COPLEY medal of the Royal Society has this year been awarded to Dr. EDWARD FRANKLAND for his valuable chemical researches; the RUMFORD medal to Professor DEWAR, for his work on low temperatures; the DAVY medal to Professor CLEVE, of Upsala, for researches into the chemistry of rare earths; and the DARWIN medal to Professor HUXLEY. The Royal medals have been conferred upon Professor J. J. THOMSON, for electrical work, and Mr. VICTOR HORSLEY, for his important investigations relating to the physiology of the nervous system and of the thyroid gland.

LOUIS FIGUIER, whose death is just reported from Paris, is best known for his popular works on science, his "World before the Deluge" being perhaps the most celebrated. He was a chemist by profession, but devoted himself mainly to the literary labours which have done so much to popularise science among the young.

THE annual dinner of the Western Chemists' Association of London will be held at the Café Royal, Regent Street, W., on Wednesday evening, November 21 next. Members can obtain tickets (6s. 6d. each) for themselves and friends from the Hon. Treasurer, Mr. J. H. MATHEWS, 68, Queen's Gardens, W., or from either of the Hon. Secretaries.

PHARMACISTS have been elected to the mayoral chair for the ensuing year at Beccles (E. WATSON), Grimsby (Ald. ENOCH PALMER), Haverfordwest (W. WILLIAMS), Lampeter (R. EVANS), Margate (Ald. E. S. WOOTTON), Pembroke (J. H. BOWLING), and Shrewsbury (Ald. W. GOWEN CROSS), while at Droitwich, STEPHEN HARRIS, chemist and druggist, headed the poll at the municipal election. Mr. CROSS, as is well known, is Vice-President of the Pharmaceutical Society, Mr. PALMER is a member, and Messrs. BOWLING and HARRIS are associates.

THE Scottish municipal returns include the names of the following pharmacists, who have been elected to the town councils of their respective burghs:—WILLIAM PARK, Broughty Ferry, an assistant local secretary for Dundee; JAMES BISSETT, Burntisland; WILLIAM DOIG, Dundee; DAVID GILMOUR, Dumfermline. Messrs. PARK and GILMOUR are members of the Pharmaceutical Society, and Mr. BISSETT is an associate.

MESSRS. PARKE, DAVIS AND Co., of North Audley Street, W., desire to disclaim any connection, direct or indirect, with certain wholesale and retail establishments carried on under somewhat similar titles.

AT the recent graduation ceremony of the University of Edinburgh, JOHN PENNY, M.B., C.M. Edin., of Great Broughton *via* Carlisle, an associate of the Pharmaceutical Society, was the only recipient of the B.Sc. degree in the department of public health.

WE learn from the *Leeds Mercury* that a work entitled 'Fifty years of Pharmacy' is in course of preparation by Mr. T. G. FORSHAW, the author of the Pharmacopœia of the Bradford Infirmary and Dispensary, and the late dispenser in that institution. One of the chapters will be devoted to a consideration of "the rise and fall of stamped medicines."

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 14th inst., the Librarian and Curator presented the following report of donations to the Society's Libraries and Museum:—

To the Library in London.

- University College, London :
Calendar, 1894.
- University College, Nottingham :
Calendar, 1894.
- Royal College of Surgeons of England :
Calendar, 1894.
- City of London College :
Calendar, 1894.
- Mason College, Birmingham :
Calendar, 1894.
- St. Bartholemew's Hospital, London :
Statistical tables of patients for 1893.
- Smithsonian Institution, Washington :
Annual report for 1892.
- School of Pharmacy Students' Association :
Papers, 1893-94, Vol. 20.
- Government Printing Office, Perak :
Perak Museum Notes, No. 8, by L. Wray, jun.
- Mr. Joseph Ince, London :
Quincy's Dispensatory, 1718.
- Professor Dr. P. C. Plugge, Groningen :
Ueber die Identität von Sophorin und Oytisin.
- Mr. J. E. Gerock, Strassburg-Neudorf :
Ueber Gaultherin, ein neues Glykosid aus *Betula lenta*, 1894.

To the Library in Edinburgh.

- School of Medicine, Edinburgh :
Official Calendar, 1894.

To the Museum in London.

- Professor J. E. van Eden, Colonial Museum, Haarlem
Fourteen specimens of barks from Surinam; *Coca* leaves from *Erythroxylon bolivianum* and *E. spruceanum* cultivated in Java; the leaves of *Orthosiphon stamineus*, *Veronica curassavica* and *Croton flavens*, and the fat of a species of *Myristica* from Borneo.
- Mr. G. H. Hawtayne, Administrator-General, British Guiana :
Fruit and leaves of the Tonka bean of British Guiana.
- Dr. E. Treacher Collins, London, through Mr. W. Martindale :
Specimens of an *Asafoetida* plant and of the gum resins *Opopanax*, *Galbanum*, and *Sagapenum*, recently brought by him from Persia.
- Dr. J. E. T. Althison, Cashmir :
Ripe fruits of *Perula nartea* from Astore.

To the Herbarium.

- Mr. D. Mitchell, Inverness :
Specimens of *Arctostaphylos uva-ursi* in fruit, and of *Lycopodium clavatum*.
- The Curator :
Specimens of *Anagallis arvensis*, with the leaves in whorls of three and four, from Torquay.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of this Association was held on Thursday, November 8, the President, Mr. R. H. Jones in the chair. After the usual formal business had been transacted a paper was read on "Sneezing" by Dr. Scanes Spicer. The author divided his paper into three sections, (i.), a brief account of the references to sneezing by ancient writers, including various traditions attaching thereto; (ii.) "sneezing in health," with especial reference to its causes and mechanism; (iii.) "sneezing in disease," such as excessive sneezing—the causes and treatment. The act of sneezing has always been regarded as supernatural, and by many races—Greeks, Romans, Mexicans, etc.—was regarded as a good omen, and as such, held in reverence. Hence arose the custom, not even now altogether obsolete, of making some remark directly after sneezing. We are told by ancient writers that sneezing was regarded as a sign of impending death during the plague of Athens. Very many classical writers make especial reference to sneezing, and some supposed that during sneezing devils were expelled.

Sneezing itself is a reflex nervous action, and is brought about by mechanical irritation to the ends of the nerve fibres which occur in the tissues of the nose. When this irritation occurs, whether it be due to a foreign body or change of temperature affecting the tissue of the nose, a nerve impulse is transmitted to the brain and certain nerve centres in the medulla oblongata are affected; this results in certain impulses being transmitted along the nerves to the muscles controlling respiration. By this means the egress of air during expiration is delayed, and the various exits are closed. When the pressure, however, reaches a limit, the exits are forced open, a powerful blast of air is expelled, and the patient sneezes. Sir Morell Mackenzie supposed that the effect of this was to expel any irritating particles from the nasal membranes, but it is more probable that certain changes in the blood supply cause a secretion of mucus, which washes away the offending particle. Sneezing may be checked by concentrating the attention on something else, or by firmly compressing the nostrils. When excessive, it demands serious attention, and the cause may be referred to certain morbid conditions.

The author concluded his paper by describing a number of instruments used in nasal surgery. These were placed on the table and included various saws and forceps, an electric cautery, and a saw driven by an electric motor.

The President remarked that sunshine very often seemed to cause sneezing, and, referring to the cocaine habit, stated that prescriptions ordering cocaine should not, in his opinion, be repeated *ad libitum*.

Messrs. Lloyd Williams, Ling, Rogers, Tickle, and other members joined in a discussion which followed the reading of the paper, several members relating their idiosyncrasy with regard to sneezing.

Dr. Spicer, in reply, stated that a branch of the nerve that reached the nasal membranes passed to the conjunctiva, and the stimulus of light to this branch was carried to the brain, which did not differentiate between the irritation to the nose and stimulus of light to the nerve ending in the eye. He was of the opinion that certain drugs should not be repeated unless the prescription was initialled, and suggested that a list of such drugs might be useful. The cocaine habit was responsible for numbers of lunatics, since it rapidly caused degeneration of the brain.

A vote of thanks to Dr. Spicer was proposed by F. A. Rogers, seconded by G. Roe, and carried by acclamation, after which the meeting terminated.

Scottish Transactions.

EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.

The opening meeting of the session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Thursday, 8th inst., at 11 a.m., Mr. Peter Boa, President, in the chair.

There was a good attendance, and apologies were intimated from Messrs. R. Aitken, Macpherson, Nelson, and F. Stephenson.

The minutes of last meeting having been read and approved, the following new members were elected: Messrs. John Brown, W. Manson, A. K. Stewart, W. Swan, T. Thompson, and A. Watt, Edinburgh; and J. McLagan, Grangemouth.

Mr. C. F. Henry, secretary, read the text of an application to the Board of Inland Revenue for permission to use proper names in the possessive case on labels for such medicines as "Dr. Gregory's Pills" and "Easton's Syrup," without the necessity of affixing medicine stamps to the packages containing the medicines. He also read the correspondence on the subject with the Glasgow, Dundee, Aberdeen, and Dumfries Associations, showing that all these associations agreed to sign the application. The Glasgow Association suggested that the points in dispute should be demanded as a right rather than as merely a concession.

In reply to the application the Board of Inland Revenue declined to make the desired concession, but expressed willingness to grant the same indulgence to the preparations referred to as allowed in the case of "Bland's Pills," and other well-known pills, under the conditions published in the *Pharmaceutical Journal* of November 12, 1887 (p. 401). By an alteration in the arrangement of the labels on the lines there laid down, the object of the application would be practically attained. To obviate the practical difficulty of specifying all the ingredients on labels for small boxes, the Board, in a further communication, agreed to grant permission for the name of the pills or other of the medicines in question to be printed after the word "pills"—for example, Pills (Gregory)—thus avoiding the use of the possessive case.

The Secretary further reported that he had communicated the final reply of the Board of Inland Revenue to the other associations interested, and had received replies expressing willingness to co-operate in any further action, but believing that the matter might now be allowed to stand on the footing indicated in the second letter from the Board.

Mr. Wylie said he thought they should raise a guarantee fund and have a test case tried. He felt sure the courts would condemn the view insisted upon by the Board.

A discussion took place, taken part in by Messrs. Bowman, Glass, MacKenzie, and D. McGlashan, and it was moved by Mr. MacLaren, and seconded by Mr. Noble, that no further action be taken, but that the method indicated by the Board be accepted.

Mr. Wylie moved that the other associations be asked to join in a test case, but this motion was not seconded, and the motion of Mr. MacLaren was declared carried.

Mr. MacLaren, as Convener of the Chemists' Ball Committee, reported that at the last meeting it was decided to ask the Trade Association to take over the cash balance in the hands of the Committee, and after this year the ball would be carried on under the auspices of the Association. The ball was now in its twelfth year, and the balance at present was about £20. It was thought better to put the matter in the hands of the Association, rather than, as hitherto, have a shifting and uncertain Committee. In the meantime, he

suggested that the Association appoint three gentlemen to act along with the Ball Committee.

This was agreed to, and the President (Mr. Boa), the Vice-President (Mr. Bowman) and the Secretary (Mr. Henry), were appointed.

The following address was then delivered by the President:—

OPENING ADDRESS

BY PETER BOA.

In the honourable position in which your kindness has placed me as Chairman of this Association, I desire to take advantage of the opportunity of this opening meeting for the session to say a few words in regard to our Association and other matters which seem to me to be worthy of consideration. Let me say at the outset that I am greatly gratified by the continued success of our Association. My earnest hope is that it may go on in prosperity and usefulness. Even in the short time of its existence it has been the means of bringing together and making better acquainted members of the retail trade within the scope of its operations. Our meetings have been favoured by good attendances, and that so many have made their arrangements so as to be here to-day augurs well in this respect for this session. Until the advent of our Association, the facilities for intercourse among members of the trade in our district were not complete. We had the evening meetings of the Pharmaceutical Society, where scientific matters were discussed and opportunity was offered subsequently for friendly chat in the tea-room. These meetings have not, however, been attended as I confess I should like to see them attended. Some members of the trade are not, perhaps, deeply interested in the subjects, others may not subscribe to the Society and do not feel at home in the Society's House. The ball was always well attended, but as we are not all dancing men there were always some to whom that function did not appeal. Now the requirements of those who are not enamoured of science or dancing are met by our Association. We are all interested in trade. Anyone who attends the evening meetings of the Pharmaceutical Society, the ball, and the meetings of our Association has a good chance to be on terms of personal acquaintance with every member of the trade in the district. We can scarcely expect many to be in this position. Men are of different tastes. I cannot, however, think that there is any one whose taste is not suited by one of the three means of promoting intercourse. There should not, therefore, be any member of the trade in our district who does not from time to time mix with some of his fellow-pharmacists. The success which has attended our Association thus far in its career is, and has been, largely due to our secretary, Mr. Henry. He has devoted to the work of the Association a very large amount of time, and he has discharged the duties of the secretaryship with an energy and wise discretion which deserves our most cordial appreciation.

Since our meeting in May the first social event of our Association has taken place, and was very well enjoyed by those who took part in it. We are very much indebted to our vice-chairman, Mr. Bowman, and the small committee who undertook to make the arrangements. Next year I am sure that a still larger number will join in this event. Since May there has not been any disturbing matter to be considered. One private circular has been issued to members giving information in regard to the procedure of the proprietor of a specialty, who was adopting toward retailers an attitude which has been assumed rather frequently in recent years. Such procedure, so far as I have observed, I may remark *en passant*, promptly gets its deserts, in our neighbourhood at any rate. We have just had read to us

the correspondence which our Association, in conjunction with the other Scottish associations, has had with the Inland Revenue in regard to certain well-known medicines. I am sorry that the Board of Inland Revenue has not seen its way to grant the concession which we asked, viz., that medicines bearing the name of the originator, which are not sold as proprietary medicines and the formulæ for which are published in standard books relating to medicine, should be allowed to be designated in the possessive case without such designation rendering them when sold liable to stamp duty. As examples, I may mention Easton's syrup and Christison's pills. The Board has granted this concession in the case of Gregory's powder, "inasmuch as it was never sold as a nostrum." It was pointed out that Christison's pills and Easton's syrup were never sold as nostrums, and logically should be treated in the same way as Gregory's powder, but the Board declined to concede the point. So far as I have been able to gain information on the subject, the Board originally declared such medicines liable for want of proper information as to their character, and as no one has, by reference to the law courts, convinced it of the fallacy of its contention, it has "bluffed" and adhered to its original decision. From time to time it declares a preparation of the nature of fluid magnesia to be liable to duty. In such an instance, a reference to the "Pyretic Saline" case invariably leads to the Board revising its decision.

I am very pleased to see that the revenue derived from the sale of medicine stamps has declined so materially. Let me hope that a still further decline will be indicated when the next returns are published. The sale of proprietary medicines advertised to cure all ailments is highly derogatory to legitimate pharmacy. Unfortunately, pharmacists were the original media of their distribution to the public, and as the medicines yielded a fair profit their sale was tolerated, and may have in some cases been encouraged. We can scarcely grumble now if, when we want to rid ourselves of them and their associations, we cannot do so as easily as we should like. The cases which have been in the law courts in connection with the sale of stamped medicines containing poison have put the public on the alert in regard to all medicines sold under a Government stamp. It is noticeable that many more inquiries are made in regard to them by persons contemplating their purchase. They ask if they are safe, if they are not "just rubbish," if the advertisements in regard to them are to be entirely, partially, or not at all believed. Up till a few months ago the purchase of stamped medicines was so much a matter of custom with the public that they went on buying without thinking much, if at all, about it. Now that they have begun to look into the matter, they are not so wanting in sense as not to perceive that they may have been not only spending their money foolishly, but exposing themselves to unknown danger. When they read, in their awakened condition, some of the advertisements of these medicines, I am not surprised that they ask their pharmacist for advice before making a purchase. To see an article advertised as suited either for internal or external use, to cure rheumatism, headache, cold in the head, hæmorrhoids, spasms, and diarrhoea, as well as being a beautifier of the complexion, is, I should fancy, enough to make even an exceptionally confiding person suspicious. In many cases where inquiry is made, the opinion of the pharmacist decides the point as to whether the article in question is purchased. It is only reasonable that the word of an educated pharmacist of known reputation should be accepted in preference to the obviously inflated statements of an unknown nostrum-monger.

The decision of the Board of Inland Revenue to apply the Stamp Act to homoeopathic medicines is, I consider, right. If an allopathic chemist be not allowed to recommend tincture of aconite for feverishness, I confess I cannot see why a homoeopathic one should be allowed to do so. In a case such as "tincture of sulphur," exemption might be claimed if it were frankly stated on the label that the "preparation" was only proof spirit.

The sale of proprietary articles has been largely taken up by drug stores owned by unqualified persons, who in many cases had not been engaged in drug business at all until they formed a "limited" company in order to trade in drugs. A draper or business man, accustomed to deal in ready-made articles, takes naturally to ready-made medicines, and his training on purely trade lines fits him to negotiate the purchase and sale of these ready-made things.

The qualified assistant whom he is obliged to employ knows something of drugs and galenic processes, and by his means the quondam draper is enabled to engage in all the procedure of a pharmacy. He then advertises that he dispenses prescriptions at only half chemists' prices. He does not mind, although thereby he leaves it possible to be implied that he is not a chemist. Few of the public would notice it. He has never absorbed any notions of professional dignity, and he advertises in a drapery-fancy-business style, to which few pharmacists of decent training can bring themselves. Company pharmacy of this sort will go on so long as qualified assistants can be found to take service under unqualified employers. At the present moment there appears to be an ambition on the part of young men to enter such service. They get better salaries, they say, and shorter hours. That is so in many cases, I admit. If they decide to be always assistants, I have not anything to say against their procedure. But if they have an intention of going into business on their own account, I wonder if they expect that the objectionable state of things which they have assisted to create and are at present assisting to maintain will disappear just when they decide to open a pharmacy.

It will, I fear, be a long time before the present condition of affairs will be altered. Probably the means by which alteration will be effected will be the conditions under which entrance to the calling of a pharmacist can be made. At present the conditions are variable. An apprentice may pass the First examination before he goes to business, or he may not. It is purely a matter for his own consideration, unless his employers have some conscientious scruples. He may be allowed time to attend classes, or he may not. His duties at first may consist largely of taking out parcels or cleaning up, or they may be such as to initiate him early into the essential operations of pharmacy.

In preparation for the second and qualifying examination he may study at a school or he may study at home; he may indeed not study at all, but seldom to be crammed. There is not a uniform method of preparation for the examination which admits the young man to the responsible practice of pharmacy. When the conditions of entrance to pharmacy are so wanting in uniformity, can we wonder at the want of unanimity and kindred interest which exists among those engaged in it? Looking at the matter from a business point of view, there are already indications that some alteration is desirable in the system of taking apprentices which has been customary here. We have been taking them for a varying term of years, paying them a graduated salary and giving them certain duties to perform. In many instances the performance of these duties was a very good return for the salary and initiation into the ways of business. It saved the employment of other labour, which would likely have been more expensive.

so far as the requirement of information would not have been regarded at all as forming part of the remuneration. If the apprentice were capable, he was towards the end of his apprenticeship entrusted with the work of a junior assistant, and in small establishments was occasionally left in charge of the business in the temporary absence of his employer. Now an apprentice is practically of no use whatever so far as responsibility is concerned. He can perform many services only under direct supervision, and, on account of the greatly extended scope of the practical knowledge of pharmaceutical operations demanded in the examination room, it is necessary for his employer to spend more time in personally teaching him. The conditions between master and apprentice have become very nearly reversed. The services rendered by the latter are an inadequate return for the privilege of introduction to the technique of the business, and the additional instruction required if he is to be sent out with a knowledge of his work sufficient to be serviceable to him and creditable to the pharmacy from which he graduated. Everything at present points to a still further increase in this direction. An assistant who has not passed the Minor now commands very poor remuneration. The consequent result is that young men endeavour to pass as soon as they are of age. This they cannot hope to do unless during their apprenticeship some care has been given to their training. When a young man has qualified he commands even now a salary that he would get at the same age in very few occupations. It seems to me, therefore, that the apprentice is rapidly evolving into a pupil, and as such he should, like pupils in other professions, either pay a premium or receive no salary. In order that he may utilise his time to the greatest advantage he must be relieved of certain duties which untrained hands can perform, and what may be regarded as his salary would go to pay the untrained hands.

I am scarcely prepared to formulate in detail an ideal pupilage, but, although I fear I am going outside the scope of a trade association and more within the boundary of educational matters, I should like to put in outline my ideas so far as they have taken shape. The pupil should be at least sixteen years of age and have passed the First examination, the period of pupilage should be four years, and there should be compulsory attendance at classes where these are available. No salary should be paid, or the pupil should pay a premium. Here let me quote from a little book, "Advice to Students," sent out by the Pharmaceutical Society. "It is hardly possible to set too high a value upon a well-regulated apprenticeship. . . . the immediate gain to be reaped from a further systematic course is in direct proportion to a previous acquaintance with the various details, partly of a business character and partly chemical, which are essential to the right conduct of pharmacy."

A young man, well trained in his first years at business will be, in sentiment and capability, fitted to support and utilise our national Pharmacopœia, which is in danger of being treated with scant respect by many who ought to stand by it. Too much encouragement is given in many quarters, unthinkingly it may be in some but willingly in others, to preparations that are stated to be "superior to the B.P. preparation," or the "B.P. article improved," or "it mixes clear with water, the B.P. does not," and so on. As traders in official preparations, I maintain that we should set our faces against such "improvements." In official medicines we want uniformity. That, I assume, is the object of having a pharmacopœia. If one pharmacist prepares his fluid extract of cascara by the official process, and another, using the same menstruum, prepares it by percolation, their products will be different in appearance and effect.

Possibly the percolated extract will be the better of the two, but it is not the official standard. Let us by all means endeavour to ascertain the method by which we can get the best preparation. If we discover an "improvement" on an official process the Pharmacopœia Committee will no doubt make a note of it, but until they sanction its use we had better keep it out of practice, unless we want to create misgivings in the minds of prescribers and patients, and give trouble to our fellow-chemists. Our Pharmacopœia has a few faults; they are, however, minor ones. It has the confidence of the best prescribers. One of these remarked to me the other day that he sometimes prescribed a novelty to please patients, but he always cured them with something from the Pharmacopœia. Preparations sold as pharmacopœial should, I maintain, be made according to the official processes.

The Vice-President, Mr. Bowman, said, owing to the limited time, he would suggest that any discussion of the points raised by the address should be delayed till next meeting. He then moved a hearty vote of thanks to the President, which was awarded with acclamation.

The President returned thanks, and the meeting then closed.

Provincial Transactions.

MIDLAND PHARMACEUTICAL ASSOCIATION.

A meeting of this Association was held at the Mason College on Thursday evening, November 8, Mr. R. D. Gibbs, President, in the chair, when a paper was read, of which the following is an abstract:—

TINCTURES AND TINCTURE MAKING.

BY H. W. JONES.

The pharmacopœial tinctures are made by several methods, the bulk being produced by a combination of maceration, percolation, and pressure. By those means it was intended to fully exhaust the drugs, and present the soluble constituents in a definite volume of liquid. The purpose was answered, but with more complex working than necessary. In the original edition of the 1885 Pharmacopœia tinct. zingib. fort. was directed to be prepared by percolation, but in the "Additions" subsequently published, three others were ordered to be so made. The general instructions for tinct. hamamelidis, and tinct. hydrastis were perfect, and it was to be taken as a sign of the times that the more modern method was recognised. That the bulk of the tinctures of the Pharmacopœia could be so prepared was not to be controverted. The three essential points to be attended to were, (1) to damp as quickly as possible to avoid loss, and to store in a closed vessel during maceration; (2) to properly pack the moistened ingredients so as to avoid air-spaces; and (3) to keep the surface just covered with the menstruum during the entire process. Some operators packed straightway into the percolator after damping, but in most cases at least, the author found it advisable to store for twenty-four hours in a separate closed vessel, and to finally mix well together, adding a little more menstruum if really necessary before the final packing. The percolator was generally advised to be of a conical shape, but operating on a large scale, with a considerable amount of material, a vessel of that form had the disadvantage of giving a large surface to the upper layer of spirit, and consequent liability to loss from evaporation. Whatever form of percolator was adopted it was a distinct advantage to have the bottom part of it tapering.

For the author's own part he preferred a tap, which could be closed or opened, to a simple tube; and

showed a model of a percolator which he had devised. This consisted of an upright, somewhat narrow metallic vessel, with a funnel-shaped bottom part, provided with a tap having a thread screw on the outer part, so that tubes of various lengths could be screwed on or off, the special feature of the percolator being a band of metal around the bottom part, deep enough to enclose the tap when the tubes were removed. By means of the band the apparatus would stand erect on any plane surface. In use the percolators were arranged on a stout bench, with diamond-shaped holes, through which the band could be passed, to turn on or off the taps, or fix the tubes. In commenting on various tinctures it was considered that with tinct. camp. co. the opium might advantageously be replaced by a corresponding amount of tinct. opii, as advocated by Squire. In the case of tinct. cardam. co. the author said he would venture to suggest that the variety of raisins known as "sultanas" might be used, as they contained no stones. As was well known, the B.P. instructions gave a product more than 80 oz. without making up. It was a tincture which could be prepared by percolation if the various ingredients were well mixed together.

It had been suggested to prepare tinct. cascarillæ by means of a weaker spirit, but Groves found that even with proof spirit it was nothing like so good as when the spirit was slightly stronger. Tinct. gualaci ammon. would be better prepared with a stronger menstruum, Wright's proportions of 18 oz. S.V.R. and 2 oz. liq. ammon. fort. giving 82 grains per oz. of solids as against 62 grains for the present spirit of ammonia. Tinct. myrrhæ was an example of a tincture which could not be prepared by percolation without previous maceration. Tinct. podophylli should not be fluorescent. The author had recently seen a tincture which was strongly so; and he had pointed out some years ago that that result was due to the employment of resin precipitated in alum water instead of by the B.P. method. Heat was unnecessary in making tinct. quiniæ, and the suggestion of Lunan as to the substitution of carbonate of ammonia for the hydrate was worthy of the attention of the pharmaceutical authorities, since the product formed a clear solution with 13 parts of distilled water, whereas the present tincture required 26 parts.

However made, tincture marcs retained a decided amount of spirit. By pressure a certain proportion could be obtained, but a relatively large quantity was left behind. He had found, for example, that a batch of 60 gals. of tinct. opii would leave something like 2 gals. in the marc; and a similar amount of spirit would be retained by marcs from 16 gals. of tinct. cinchon. co., tinct. hyoscyami, and tinct. sennæ, respectively. In no case was it desirable to wash out that spirit with water, if it were intended to form part of the finished product. On the whole, he preferred to percolate right through with the proper menstruum till the full bulk was obtained, and to recover the spirit from the marc by distillation in a large still with sufficient water to prevent the formation of clots of material. To wash certain marcs with water took considerable time, during which the mass was apt to become mouldy or decomposed.

In reference to standardised tinctures there was a definite statement as to the alkaloidal strength of both tinct. opii and tinct. nucis vomicæ in the Pharmacopœia. Experience had shown that the menstruum did not exhaust the opium, but by taking a tincture made with a strong opium, and one made with the B.P. drug, the percentage required could be obtained by mixing the two in the proportions indicated by an assay. As to the method of assaying tinct. opii, he would prefer to follow the B.P. method as closely as possible rather than attempt washing out with acetic ether and chloroform. Familiarity with tinct. nucis

vomicæ had not strengthened the view that the use of extract was the best method of preparing it. Similarly the employment of extracts of other drugs was not to be advocated. The method had received particular attention at the 1893 meeting of the British Pharmaceutical Conference and had been condemned. A tincture was supposed to contain the constituents of the drugs as they existed in the drugs themselves, unaltered by heat. Gerrard's statement had not been controverted, that with atropine a solution boiled with alcohol even for ten minutes lost 50 per cent. of its alkaloidal constituents. At present there was no direct authority for standardising generally, but there was a demand for standardised preparations; and the result was that in the absence of official methods each wholesale house, or each pharmacist, was left to fix the standards, so that uniformity was not likely to exist. Something was wanted more than mere statements of percentages; the methods of analysis should be well defined.

Mayer's solution was out of date, and it was hardly settled whether volumetric methods or gravimetric processes should be followed, or even in some cases as of that of aconite, if the test should not be physiological. Messrs. Wright and Farr stood pre-eminent amongst British workers, and had for years been publishing the most important results, and he thought their methods of assay might well be adopted. Various standards had been suggested, in most cases of average good drugs, but the author of the paper had met with a practical difficulty which required some consideration. It was, that it was not difficult frequently to obtain drugs above any average that might be fixed, and the question arose, should we use less to produce a preparation of "average" strength? He thought not, as the pharmacopœia distinctly ordered a definite weight to be taken, so that for the present at least he ventured to suggest that the standard adopted should be that approximating to the highest percentage.

Concentrated tinctures might receive some attention at their hands. They were more properly described as fluid extracts, and experience had shown that fluid extracts, prepared with proof spirit at least, were somewhat unstable. So that it might be asked, what strength of spirit should be used for exhaustion? As an example they had tinct. catechu, and to produce a concentrated tincture four times the ordinary strength, it was required to dissolve or exhaust 10 oz. of catechu with sufficient proof spirit to produce one pint of finished liquid. Could a permanent and satisfactory preparation be so made? Again, capsicum formed a tincture, in which an excess of spirit might appear to be used for exhaustion, but the dose being small it was probably better for dispensing purposes than a stronger tincture given in smaller amounts. If concentrated tinctures were used, they should be employed for special purposes, rather than for the preparation of the official tinctures.

The President said they were all much indebted to Mr. Jones for his paper.

Mr. John Barclay, in moving a vote of thanks, said that he fully agreed with Mr. Jones that in many cases the method of percolation adopted in the B.P. addendum was by far the most useful method of preparing tinctures. He had not found any great difficulty in recovering spirit from marcs such as ginger, by washing through with water, but of course it took time. With regard to tincture of opium he had found it possible to practically exhaust the drug if it were used in the moist condition and thoroughly softened with water, the quantity of rectified spirit necessary to produce proof strength being subsequently added to the marc. Referring to the use of standardised extracts

ducing standardised tinctures, he was strongly in favour of the plan for if the extracts were reliable, so would be the tinctures obtained from them. It was true that the physiological assay of alkaloids was by far the most valuable and, as had been shown by Dunstan, the only reliable method in the case of aconite alkaloids, but until physiological methods were more matured he thought the weighing and subsequent titration of an alkaloid with standard acid would be found very valuable. In preparing standardised tinctures, it was important to have the standard sufficiently high, and that being so, he thought that the pharmacist who used the P. quantity of a drug in preparing, say, a tincture was amply justified in diluting that tincture if his assay of it showed the drug to have been abnormally strong. He had had some experience of growing opium in the Midlands, viz. at Evesham, and had found the attempt was very fairly successful. With reference to concentrated tinctures, no one supposed that they were so good as the more dilute preparations, and in many cases it was utterly impossible to prepare them, but there was a demand nowadays for concentration, and to medical men particularly standardised concentrated tinctures were undoubtedly useful.

Mr. Alcock asked how the pharmacist, who was not content unless he made his own tinctures, could economically recover the 2 ounces of spirit lost in making 1-pint batches of tinctures. It had been observed by several workers that when making aegoric elixir with tinctura opii in place of opium, turbidity was produced which in a day or two passed away and the liquid became quite clear, no sediment being formed. By the substitution of sultanas raisins for the official variety of good quality distinctive and characteristic flavour imparted by the latter was lost. In the preparation of large batches of extractum cinchonae liquidum, much alkaloid was lost during the process of evaporation, and perhaps the same thing occurred when making vinum ipecacuanhae, it was therefore not desirable that tinctures generally should be made from extracts or concentrated liquors, if heat were used in their preparation. The method often suggested for making laudanum by extracting first with warm water, cooling, and then adding the correct amount of S.V.R. was not to be encouraged. Much mucilage was thereby removed, only to be precipitated again on the addition of the spirit, and this precipitation might go on for some time in the finished product. There were serious objections to the standardisation of potent tinctures unless the amount and name of the physiologically active constituent present in them were carefully determined and stated. Thus tinctura nucis vomicae probably owed its activity solely to strychnine, but as "1 grain of total alkaloids per fluid ounce" might be made up of any proportion of the alkaloids of nuxvomica, and it passed muster if only a trace of strychnine were present. It would be better to say that it shall contain 1 grain, and that at least half a grain shall be strychnine. Time forbade further remarks on this interesting paper, and he concluded by endorsing the vote of thanks proposed to the author.

Mr. Gibson (Wolverhampton) spoke of the difference in tinct. card. co. when made with B.P. raisins, and when "sultanas" were used.

Mr. Perry agreed with Mr. Alcock that it was a retrograde step for pharmacists to give up, as many of them did, the making of their tinctures and other preparations. If such a practice were resorted to and continued in, pharmacy, except in the hands of a few, would be in danger of becoming a lost art. It belonged to pharmacists to set their face against it. With regard to the preparation of tinctures, no doubt the process, of which they had several examples

in the B.P.C. formulary, and to which Mr. Jones had alluded, was an "up-to-date" process, and could well be extended to many other tinctures. At the same time for many drugs, and especially where it was desirable to retain to the fullest the odorous principles, and where consequently the materials should be subjected to as little heat and exposure as possible—especially for small quantities—maceration with the whole of the menstruum, with subsequent pressure and without any additional spirit to "make up," would, he thought, have the preference. In recovering the spirit from the marc, Mr. Perry was not clear whether Mr. Jones pressed the marc before transferring it to the still; did he mix the marc with a quantity of water before distilling, or distil without admixture with water? In reference to the standardisation of tinctures, he asked Mr. Jones if in connection with the "shaking-out" process for the determination of alkaloids he had tried the device recently recommended, of filtration under pressure, for overcoming the trouble and tedium occasioned by the formation of "emulsions." He cordially supported the vote of thanks.

Mr. Jones, in his reply, said that, with regard to the recovery of spirit from the marcs, he passed spirit through sufficient to make the required quantity. He did not press the marc, but transferred it to the still, added a quantity of water, and recovered by distillation. He had not tried the apparatus spoken of by Mr. Perry in connection with the "shaking out" process.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

A meeting of the members of the Manchester Pharmaceutical Association was held on Wednesday last at the Grosvenor Hotel, Manchester. Mr. G. S. Woolley, President, occupied the chair, and there was a large attendance. Mr. J. Rymer Young gave an address on the work of the Pharmaceutical Council during the past eighteen months. This is printed at page 393.

The Chairman in proposing a vote of thanks to Mr. Young for his valuable paper, said the meeting might not agree with all that he had said, but they all thanked him for coming from Warrington to give them so valuable an address.

Mr. H. Kemp, Secretary, seconded the motion, which was carried with acclamation.

The Chairman then said that one point in Mr. Young's paper struck him as going to the root of matters. It was about the opposition to the Bill that the Pharmaceutical Society drafted last April. The great object of the Bill was to unite the trade more than it was united at present, and to do away with those bickerings and objections that had done so much harm in the past. As Mr. Young said it was no use crying over spilt milk; and, going back half a century. With reference to the widows clause, the late Mr. Brown and he (the chairman) pointed out when they went to the Council meeting in London in 1870 the harm that the clause was likely to bring upon them. Of course the thing was done, and they had never been able to repair it. Then, as to the sale of poisons, from the very first that ought to have been tackled in a much more drastic manner than it was. From the very first, people who sold photographic chemicals were allowed to sell two or three ounces or even half a pound of cyanide of potassium in a perfectly irresponsible manner, and when it was asked—Why not stop it?—the answer was we should be interfering with trade. It ought to have been tackled at once, the wrong ought to have been put right. It was not done, and they were reaping harm from it to-day. As regarded this Bill the opposition of Mr. Harrison,

of Sunderland, a very good friend of his, was one of those things he could not understand, as the Bill was calculated to do much good if passed.

Mr. H. Kemp said that, perhaps more than some of those present, he had been aware during the past eighteen months of much that had been going on in the Council, not only in that portion of its work which was made public through the journals, but also with much that had taken place in private in the committee room. He believed a body of men never existed who had more deeply at heart the welfare and good of the trade than the present Pharmaceutical Council. The members were one and all imbued, he believed, with the desire to do all they possibly could within the limits of their laws. As Mr. Young had pointed out, the widows' clause had restricted the Council very much, and the apathy that had been laid to its charge had arisen, in his opinion, rather from without; but within the last three or four years there had been a very evident waking up, not only so far as the Council was concerned, but so far as the trade at large was concerned. In going round and speaking to his brother chemists, he found that there was a stronger desire than ever for amalgamation and for rendering support to the Society. That very day he had a conversation with two chemists who were formerly members of the Pharmaceutical Society, but were so no longer. They explained that they had withdrawn because they felt that the Society was not doing much for the trade. The answer was, of course, that the Society could be doing no more for the trade to-day than it was doing when those gentlemen left. If the trade had not supported it, if everyone had followed the example of the two gentlemen to whom he had referred, they would have been in a very much worse state than they were. Anyone who knew anything about the work of the Pharmaceutical Society during the last eighteen months would bear out the statement that the Council had worked "tooth and nail" to enforce the Pharmacy Act against illegitimate trade wherever it had been feasible in any degree, and where the interests of the trade had been assailed by endeavours to patent concoctions containing scheduled poisons, with a view to thwarting the provisions of the Act, the Society had done a great service to the trade—a very great service indeed. Had things been permitted to be patented there was no telling where it would have ended. They would have been surrounded very soon by a host of patent medicines, so-called, sold by everyone and anyone without restriction or qualification. Mr. Young also spoke of the changes on the Examining Board, and said very rightly that additions and eliminations might well be made in the case of the Council itself. That was a matter on which he (Mr. Kemp) felt somewhat strongly. A little more interest might be taken generally in the election of the Council. If the men who subscribed their guineas would but take the trouble to inquire into the capabilities and utilities of the men who constituted that Council, they would see that it was to their interest sometimes to make a little change at all events. The difficulty was they could not name a man for removal. It would be libellous, or at any rate it would be bad form, to say of this or that man that he was not fit for a seat on the Council. Respecting the Benevolent Fund he would at once say he did not agree with Mr. Young. Individually he could trust Mr. Young and his colleagues to do their very best in the interests of the annuitants and the subscribers, but he knew there were many who preferred to have a voice in the election of the candidates. Whilst there was that feeling no interference should take place. Anything that would interfere with the income would be a very serious mishap. The income at present was too small, and if there were nothing at all to interest the sub-

scribers, he was sure some of them would fall out. One other thing in connection with the Benevolent Fund he would like to mention. It was a most painful thing to anyone who had the slightest sympathy with human suffering to see a number of individuals who could not be elected this year under any circumstances, and who must be in a most awful condition. The Council, it seemed to him, made a mistake when they increased the annuity from £40 to £50. It would be very much better to elect five candidates at £40 a year than four at £50. Those who suggested the alteration said that £50 was little enough for those who had at one time been in affluent circumstances, and with that he agreed. But they had not the £50 to give, and he repeated that it would be better with their limited funds to assist five rather than four. He hoped the Council would see their way if the Fund did not increase to elect more annuitants at a smaller amount. With regard to the Draft Bill his impression was that Mr. Harrison, of Sunderland, did not oppose it in principle; he merely opposed the proposal that the Council should proceed with the Bill in its present unsatisfactory state. While he was quite in accordance with any movement having for its object the consolidation of the trade, at the same time he thought it was useless to proceed with a Bill which did not also tackle some of the more serious defects of the present Pharmacy Acts. At present there were two classes too many in the Society. If they could all be classed as members it would be a decided advantage. Mr. Young said he would like to see the Society supported by the whole of the people on the Register, but that could never be unless every man who passed his qualifying examination was made a life-member by payment of an examination fee. There were men who would not and there were men who could not join afterwards. There were men who had gone into the medical profession and into the dental profession. In the Manchester district there was one who had become a policeman. The work of amending the Register was not an easy matter. In the Manchester district there were fifty names on the Register, and of the whereabouts of those fifty people he knew nothing. They were not known at the addresses given; some of them must be dead. Nominally there were 15,000 names on the register, but he did not think there were 12,500 actual chemists who were in trade at the present time.

Mr. Charles Turner said the Preliminary examination, in his opinion, was a great source of evil. It did not approach the standard of the Minor examination in any way whatever. He believed there was a difficulty in raising the standard, and attention was being drawn to the question whether the Preliminary examination was legal.

Mr. Brooks wished to know if anything was being done in reference to the time during which candidates were kept in London, and in Edinburgh. Under existing arrangements a candidate might undergo one day's ordeal and then have to wait a week or a fortnight for a second day. This meant great expense, and he should like to know if anything was being done in the matter.

Mr. Hoseason was of opinion that no one could be a competent examiner until he had taught a subject. As Mr. Turner said, the Preliminary examination did not correspond with the Minor examination. The Preliminary, he thought, should include higher mathematics and a fuller knowledge of arithmetic. After speaking in favour of the adoption of the metric system Mr. Hoseason made a reference to the sale of poisons and said no one but a qualified man should be allowed to sell poisons, then there would be no need for the Schedule. A medical man when he prescribed arsenic, did not label his prescription, and when

should a pharmacist who was qualified to sell poison be compelled to label it?

Mr. Kirkby said Mr. Young had indicated that the Pharmaceutical Society might take proceedings under the 17th section of the Pharmacy Act. That section distinctly stated that the seller of the poison was the person on whose behalf it was sold, and that the poison was to be labelled with the name of the seller. It seemed to him that the Society had not tried how far that section would go in connection with the company trade. Would the Court require the name of the company, or the name of the manufacturer?

Mr. Young, in reply, said that when he spoke of additions to and eliminations from the Council, he was not, of course, alluding to any individuals in particular. He spoke on general principles in favour of a gradual change in the complexion of the Council. Mr. Kemp had spoken of the number of dead men on the Register. He had not thought they were anything like so numerous. With regard to the annuities, when they were raised from £40 to £50 he was not a member of the Council. It was his impression that the change was a mistake, and there were some members of the Council who agreed with that view, and very frequently ventilated it. He should like to say that every member of the Council suffered from the troubles and grievances which afflicted other members of the trade. In addition to the pleasure of participating in the work of the Council, he had also the privilege of listening to grumbings from north, east, south, and west, as to the state of trade. In reply to Mr. Turner, he had to say there was no statutory power to regulate the Preliminary examination, but it was in the power of the Pharmaceutical Council, by agreement with the Privy Council, to regulate it, under the Bye-Laws. He thought something should be done for the convenience of students during the period of examination, but it should be remembered that their numbers were large and it was difficult to make arrangements to suit everyone. He recognised that the meeting did not agree with his views in reference to the election of annuitants, but he thought if those present had to listen to the pitiable applications for relief that were made they would change their views.

A social meeting was afterwards held, at which Mr. Alderman Robert Gibson took the chair.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE APOTHECARIES ACT.

MEDICAL TREATMENT BY AN UNQUALIFIED PERSON.

At the County Court, Cardiff, on November 7, the Master, Wardens, and Society of Apothecaries of London brought an action to recover from G. Muxworthy, Cardiff, the sum of £20 for having contravened the Act of George III., the allegation being that defendant had advised and furnished medicine to Mrs. Ryan and John Penlington whilst not duly qualified. Mr. Ryan deposed that his wife being ill he went in search of a nurse, and by mistake called at the house next door to the one he intended to apply at. There he saw the defendant, who told him to rub oil and hot vinegar on the parts affected, and old him a bottle of oil, charging 1s. 1½d. He noticed he name "Dr. Hall" on the house. Subsequently nurse attended his wife, and advised him not to use the oil. For the defence counsel contended that defendant was entitled to sell patent medicines that were not poisonous. Defendant denied that he advised Ryan in any way, and said that he sold the oil at Ryan's request. His Honour gave a verdict for the plaintiffs.—*Western Press*.

PROCEEDINGS UNDER THE MEDICINE STAMP DUTY ACTS.

SALE OF PROPRIETARY MEDICINES WITHOUT STAMPS.

At Marlborough Street Police Court on November 7, Mr. Hannay imposed fines amounting to £32 10s. upon Jefferson Dodd, chemist, 70, Tottenham Court Road, London, for selling proprietary medicines without the proper stamps.—*Morning*.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

IMPURE PRECIPITATED SULPHUR.

John Frederick Harston, chemist, High Street, Lincoln, was summoned at the Lincoln City Police Court on November 8, on the information of James Bradley, inspector of weights and measures, for selling, through his assistant, Harry Taylor, precipitated sulphur which was not pure, but a mixture of sulphur and sulphate of lime, namely sulphur 42.5 parts and hydrated sulphate of lime 57.5. Inspector Bradley stated that on the 24th ult. he purchased some of the sulphur for analysis, the result being that the public analyst declared it to be impure. Defendant contended that a different article, milk of sulphur, was supplied by mistake, and was labelled as such. The mistake arose through the assistant being only temporarily employed. The article was not represented on the label as precipitated sulphur. A fine of 15s. was imposed.—*Lincolnshire Echo*.

POISONING CASES AND INQUESTS.

POISONING BY POTASSIUM CYANIDE.

Oliver Thackwell, aged 14, died at Bournemouth on Monday, October 29, from the effects of potassium cyanide contained in a solution prepared by his employer, a hairdresser. Verdict: "Suicide, committed while temporarily insane."—*Bournemouth Observer*.

DEATH FROM OVERDOSE OF LAUDANUM.

Alfred Irlam, aged 33, a lithographer, died at Bradford on Sunday, November 4, after taking laudanum for sleeplessness. Verdict: "Death was due to an overdose of laudanum."—*Bradford Argus*.

DEATH FROM OVERDOSE OF HYDROCYANIC ACID.

Dr. Kirkman, of Hastings, died on Saturday, November 3. He had been in the habit of taking twelveminim doses of hydrocyanic acid. An inquest was held on Wednesday, November 7, to investigate the cause of his death. Verdict: "Death from an overdose of hydrocyanic acid, taken accidentally."—*Sun*.

POISONED BY ACONITE AND BELLADONNA LINIMENT.

James Hopping, a hay-trusser, died at Tewkesbury on Thursday, November 8, from the effects of a liniment containing aconite and belladonna, taken by misadventure. Verdict: "Accidental poisoning."—*Birmingham Daily Post*.

POISONING BY LAUDANUM.

John Graham, aged 3½, died at St. Rollox, Glasgow, on Wednesday, November 7, after the administration of a few drops of laudanum from a jug, by his mother.

POISONING BY ARSENIC.

Gad Kilner, of Conisborough, died on Tuesday, October 30, after taking a large quantity of arsenic. Verdict: "Suicide whilst temporarily insane."—*Leeds Mercury*.

Correspondence.

STANDARDS OF PURITY.

Sir,—We are desired to ask your leave to correct two misunderstandings expressed in your recent leading article on the subject of the draft for a new Sale of Food and Drugs Bill, drawn up by the Council of the Society of Public Analysts. You express objection to the constitution of the proposed Board of Reference for appeal in case of disputed analyses, urging that the Board should include nominees of representative bodies of chemists and of grocers. May we point out that our draft scheme provides for the inclusion—not, certainly, of a representative of the grocers—but clearly of a representative of pharmaceutical chemists and chemists and druggists, viz., “a person nominated by the General Medical Council.” It was at first proposed to say “a person nominated by the Pharmaceutical Society of Great Britain and Ireland,” but seeing that the official standard for the composition of drugs which we advocate is the British Pharmacopoeia, and seeing that the British Pharmacopoeia is issued under the direction of the General Medical Council, it seemed to our Council, rightly or wrongly, that the General Medical Council should be the body to appoint the representative of the pharmacists. The functions of the proposed Board of Reference would be essentially chemical and analytical functions, in which the representation of pharmacy would necessarily be of direct assistance, while the actual representation on the Board of grocers or similar tradesmen would be out of place. Such a Board, it need scarcely be pointed out, would, however, be able to avail itself to any extent that seemed good to it, of the views of any trade representatives who might from time to time be deputed by existing trade organisations to lay before the Board facts or suggestions arising out of their own practical experience in trade. Another point to which you take some exception is the clause to the effect that “no certificate other than that of the public analyst shall be received as evidence unless supported by the oral evidence of the analyst giving the certificate,” and you say that “it is difficult to see why the certificate of that individual should be considered of equal value as evidence with the oral evidence of other chemists, frequently experts with both greater general and special knowledge than himself.” Your exception here appears to be based on misunderstanding both of the law as it exists, and as we propose that it should exist. At the present time the certificate of the public analyst is in itself evidence, but the Sale of Food and Drugs Act allows the accused person, at his option, to require the attendance of the public analyst to support his certificate, and to be cross-examined thereon. It is only when the defendant abstains from taking this step that the certificate of the public analyst is sufficient evidence in itself. On this head our draft bill proposes to make no change whatever in the existing law, but only to point out more clearly to magistrates that a certificate from any other witness than the public analyst is not, and cannot, under any circumstances, be legally accepted as valid evidence without the personal attendance of such witness. The sole object of the provision as to the evidential value of the public analyst's certificate is to avoid the unnecessary expense and trouble of the analyst's attendance at the large proportion of undefended cases which occur. When a dispute as to analysis arises, it is only in accordance with common sense, as well as with the law, that the analysts who differ should be summoned

to explain themselves, whether they hold an official or unofficial position. It ought not to be necessary for us to say that the Society of Public Analysts entertains none but the most cordial feeling towards the Pharmaceutical Society and the great interests which it represents.

EDWARD BEVAN.

BERNARD DTEK.

London.

Hon. Secs. Society of Public Analysts.

WATTS' DICTIONARY OF CHEMISTRY.

Sir,—Referring to your review of the fourth volume of Watts' Dictionary of Chemistry, just issued. I desire to draw attention to a discrepancy or ambiguity which occurs in it, and has appeared in each of the three preceding volumes, as well as on the book-markers of abbreviations which are supplied with them. The contractions “S.” and “S. (alcohol)” are defined as meaning respectively the solubility in water and the solubility in alcohol, and it is further stated “of a liquid or solid;— number of gr. dissolved by 100 grms. of water. In both cases the temperature is stated.” The words “and of alcohol respectively,” or others to that effect, are omitted after “water.”

WM. MARTINDALE.

LEONURUS CARDIACA.

Sir,—I remember some years ago finding *Leonurus cardiaca* in the vicinity of Bodiam Castle, Kent. I believe it is also to be found near a few other old places in the country, having no doubt been cultivated in by-gone days for its medicinal worth.

Sheffield.

JOHN AUSTIN.

Diary of the Week.

SATURDAY, NOVEMBER 17.

Pharmaceutical Football Club v. London Welsh B. & Child's Hill, Cricklewood, at 3 p.m.

MONDAY, NOVEMBER 19.

Imperial Institute.

House Dinner, at 6.45 p.m.

“Malta and its Antiquities (illustrated),” by the Rev. W. K. R. Bedford, at 8.30 p.m.

WEDNESDAY, NOVEMBER 21.

Imperial Institute, at 8.30 p.m.

Ladies' Concert.

Royal Microscopical Society, at 8 p.m.

“On a Simple Method of Measuring the Refractive Indices of Media,” by E. M. Nelson.

“Demonstration on Staining Central Nervous System,” Dr. W. A. Turner.

Western Chemists' Association (of London); at 7 p.m.

Annual Dinner at the Café Royal, Regent Street Society of Arts.

Opening Address by Major-General Sir John P. Kelly, K.C.B., Chairman of the Council.

THURSDAY, NOVEMBER 22.

Imperial Institute, at 4.30 p.m.

“Australian Hardwoods and their Uses,” by Charles R. Fenwick.

Chemists' Assistants' Association, at 8.30 p.m.

“Surgical Dressings,” by E. White.

Liverpool Chemists' Association.

“Some Objects of Pharmaceutical Interest in the Liverpool Museum (illustrated),” by T. H. Warburton.

SATURDAY, NOVEMBER 24.

Pharmaceutical Football Club v. Novocastrum, Ponder's End.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Blackburn, Cracknell, Druce, Durrant, Harris, Kemp, Kirkby, Lucas, Martindale, Minter, Newbould, Perry, Phillips, Shillinglaw, Smith, Young.

THE NERVOUS SYSTEM IN THE VEGETABLE WORLD.*

BY J. REYNOLDS GREEN, M.A., B.Sc.,

Professor of Botany to the Pharmaceutical Society of Great Britain, and Dean of the School of Pharmacy.

There are few more fascinating things in the study which we generally call natural history than the comparison which we find it possible to make between the animal and vegetable organisms. For many years past the idea that all living Nature is composed as it were upon one fundamental groundwork of living substance has been gaining ground, and more and more similarity has been found between the two classes of organisms which we have somewhat arbitrarily divided it into—the animal and vegetable kingdoms. The attempt that was made in former times to set up an arbitrary distinction between the animal and vegetable worlds has broken down at almost every point, but one thing especially was laid stress upon as a sort of forlorn hope or point of refuge to which the framers of definitions could go. We used to be assured that even if plants could move, which was perhaps disputable, at any rate they could not feel, and the power of feeling, at any rate, was a final and crucial line of separation.

What is a Nervous System?

Now it is desirable in the first place to understand what we mean by the term "a nervous system." Of course, in the higher animals the thing is perfectly plain and obvious, but it is not so obvious, perhaps, when we go down to very simple organisms. A nervous system, although ornamented with a somewhat formidable name, does not necessarily mean anything extensive. It includes perhaps three ideas. First, the power of originating a movement, or some other vital process or occult molecular change going on in the organism itself, as we, for instance, have the power of initiating movements of various kinds and associate them with particular nerves. It embraces, again, the power of receiving impressions from without. The powers which we call senses evidently belong to a somewhat different category than the power of initiating movements. Then we have finally in the animal world a third factor, a sort of power of co-ordination by which the impulses, the sensations which we appreciate as coming to us from without, find expression in various movements or other things within. Thus there is in the organism a central power which can co-ordinate these different classes of things. When we descend in the scale of Nature to the very lowest organisms we find those represented in a somewhat rudimentary or primitive form. The *Amoeba* is a little organism which consists primarily of a lump of some jelly-like substance. It is one of the humblest forms of life we know, and there is a very little structure about it. It is chiefly characterised by the power of changing its form, not at all rapidly, but still constantly. If it be irritated in any way it can roll itself up like a lump of jelly, and you can see very little more than structureless material which is living. It has the power of changing its form in consequence of receiving disturbances which we call stimuli from without.

In the *Myxomycetes* or *Mycetozoa* there is pretty

* Lecture delivered at an Evening Meeting held on Wednesday, November 14.

much the same thing, a collection of the same granular, jelly-like substance. These are the humblest plants we know. There is a great deal of dispute amongst persons who like to dispute, to determine whether they are really animals or plants, but botanists claim them on account of a peculiar structure which at particular times they display. There is an essential similarity in general appearance between these organisms and the last, and these are our starting-points for the differentiation which proceeds from them in the two directions, which we call animal and vegetable.

Differences between Animals and Plants.

The difference which we see in the higher plants and in the higher animals generally takes definite shape with regard to the environment in which they move. Animals, as a rule, are so placed that they specially mark their life by active motion and locomotion. Plants, on the other hand, by reason of their environment show motion to a very slight degree. You see that a plant has to rest practically where it is placed. Its environment is still and quiet, and it cannot change it at its will as an animal can. Starting from this point, consider what the nervous system, if it exists, is intended to do. We get the clue to it if we consider that no organism can exist at all satisfactorily unless it is in harmony with its environment. If you get a perfect agreement between the environment and the organism, you get what is known as a healthy condition, and the organism is at its best.

As you know, the great majority of our plants are stationary. They find themselves rooted in the soil, their branches are spread open in the air, and gaseous contact is, practically speaking, the only contact which the plant has. The air then is one of the chief factors in the environment of the plant. We may state several influences which it can bring to bear. It can vary in temperature between the extremes of heat and cold. It can vary in dryness; we may get excess of moisture, and almost its absence. Secondly, and closely connected with the air, is the degree of illumination to which the plant is exposed; we get, that is, variations in the light, alternations of day and night, daylight, clouds, bright sun, and so on. We get the plant then showing the need of a certain adaptability to such variations as I have spoken of. The part of it which is subterranean has to be considered from a rather different point of view. The roots are firmly fixed in the soil; there is generally an absence of light, although not an entire absence, for the soil is porous and the light penetrates by various crevices. We find the soil, of course, consisting very largely of solid particles, through the interstices between which the plant has to make its way, and we find next that the soil varies very considerably with regard to the amount of water from time to time it can contain. We may take it next that the plant is always exposed to a peculiar subtle influence which we call the force of gravitation, constantly existing, of course, and constantly bringing its power to play on the organism rooted in the soil, as well as on those which are capable of motion. Such is the environment.

The Influence of Environment.

Now what are the advantages which such an environment presents to the plant? The plant is very much sub-divided as to its body, in order to

take advantage of the resting position which it is bound to assume, and this sub-division takes the form generally in the plant of so-called leaves. These leaves have, of course, very definite duties to perform, otherwise no doubt the shape would not be as it is. There is a flattened surface to secure as great an exposure to light and air as possible. The cells, especially on the upper sides, are crowded with relatively large green granular bodies known as chlorophyll grains, which are impacted in the living substance which lies round the walls of the cell. Each cell has its own complement, and they are very numerous. It is by virtue of these small bodies that the plant is able to take advantage of this factor of its environment. They are the factors which the plant uses to avail itself of the food which is present in the air. We have constantly the power of absorbing a large amount of food by virtue of the exposure of these chlorophyll bodies to the environment. That is the advantage this particular form offers to the plant through the leaf.

The root, on the other hand, impacted as it is in the soil, is especially set apart for the purpose of taking in substances in solution in the water which permeates the soil. The particles of soil are impacted closely on certain absorbing projections on the surface of the root known as root hairs, and a very close connection there is between them. So that to take advantage of the environment the plant has laid itself out and sub-divided its upper surface to such an extent as to expose these chlorophyll bodies to the light, and it has developed at the same time, in the lower portions in particular, the sensitive regions known as rootlets, which are absorbing regions. It is a question of adaptation, no movement being possible, and a large increase of surfaces has been reached, so that the loss of movement may not be felt.

Now certain dangers attend an environment of this kind. The light may be too strong, or it may be too weak. There is a maximum, or an optimum, at which vital processes go on best. On the other hand the roots, in penetrating the soil, may very likely be injured by coming in contact with or growing down on to certain portions of stone, or other impracticable substances, from which they could get no nourishment, and would probably lead to the destruction of their tissues. Again, the temperature may vary considerably, and such variation may bring certain dangers with it. We have, then, in studying the life processes, and particularly the nervous processes, of plants, to bear in mind what the plant wants, how it can get it most readily, and from what dangers it can be defended.

Tendency to Sensitiveness in Plants.

We may pause here for a moment to ask ourselves whether plants show any general tendency to sensitiveness, whether they are rigid bodies with no power of reaction in general, or whether we can see a foreshadowing of something like what we ourselves feel in a general susceptibility to changes in external conditions. We find an instance of this in the plant known as the telegraph plant, *Desmodium gyrans*, which has two little wings upon the curious leaves. When the plant is in favourable conditions these little wings are continually moving up and down; perfectly spontaneous movements, which go on re-

gularly. The leaf drops by a series of jerks, then raises itself again. There are some of these plants in the Botanic Gardens, and there, if you watch with care, you will find these lateral leaves perform these cycles about once in every three minutes, so that the thing is perfectly visible and can be watched fairly easily. If such a plant be not put into proper conditions of temperature, illumination, and the like, it loses power of spontaneous movement, so that there is a sort of depressing influence brought to bear upon it following out the idea that the living substance has a sort of irritability of its own upon which we build up this superstructure of a nervous system. If the light be too great or too feeble, or the temperature be too high or too low, the plant ceases to act. This peculiar condition, then, in which a plant may be called most irritable is a condition known as a "phototonus." When the plant is in a phototonic condition you will see these movements go on in the normal way. The failure of any condition necessary to its health will throw it out of this condition. It is a very delicate, sensitive plant, and can readily be disturbed. If we may start with this as showing that the vegetable protoplasm has, at any rate, the capabilities in the direction of differentiation of nerves. It is a curious thing that the ordinary conditions of growth in most plants depend upon a phototonic condition. If the plant be in a condition, although not otherwise unhealthy, growth will cease.

Instances of Special Sensitiveness.

So much, then, for a preliminary or introductory statement. To pass now to more interesting instances of special sensitiveness, you will remember that we can look for manifestations of nervous power in two conditions; first, the efferent or motor mechanisms analogous to those we put out when we wish to move our finger or our arm, and do so, call those efferent because impulses leading to motion come from what we call a central nervous region. When a fly alights on a portion of the Sundew leaf, the tentacles close over and enclose it, and the process of digestion proceeds at the expense of the fly. We localise in these tentacles, then, a power of movement. Now if we stimulate that leaf by an electric current, as we can do readily by connecting one pole of a battery with one point of the leaf, and another with another, and so sending an electric current across the leaf, we shall find, in response to the electrical stimulation, the tentacles curl over in the same way that they do if a fly or other insect alights upon it. We have there a sort of power, exciting, as it were, this efferent or motor apparatus. It is in a very humble way if compared to the muscular mechanisms we ourselves possess and put forth in similar circumstances of irritation. There is a little alga called *Mesocarpus* that shows this particular power of response to an electric current. If a current is sent through a drop of water in which *Mesocarpus* filaments are plunged, instead of the whole filament moving about, each cell violently contracts, the separating cell walls are ruptured and the thing splits up into as many pieces as there are cells. Evidently there is a power of response to the stimulant of the electric current much in the same way as in the higher animals. The difference is to be seen in the incompleteness of the mechanism.

response rather than in the appreciating of the disturbing cause.

The so-called afferent or sensitive mechanisms are those by which an organism appreciates any change taking place in the outside. We have first of all the reception of an impression brought to bear on the individual by some change from the outside; we speak of sight and taste and smell, and so on. We appreciate these things by particular sense organs, but you know, of course, they are caused by particular variations of the environment reaching us through special mechanisms. That is the first thing then, the reception of an impression, and then the last thing is a particular movement which generally results, in which some other part of the organism is concerned than the other part which receives the impression. Between these two we must have a third. We have a co-ordinating mechanism by which the impression received finds its exposition in the movement, or whatever form it may take, which follows the reception. There are, then, these three things to bear in mind, and we have precisely the same thing in the plant as we have in the animal, but the differentiation has gone in a very different way. In the animal the great perfection of the whole thing is seen in the response. In the plant the great delicacy is seen in the sensitiveness, and in some respects plants are more sensitive to impressions from without than animals. The response to the stimulus is very difficult for the higher plants to manifest, and that, perhaps, may be the reason why the sensitiveness is that which we study most easily. The plant is fairly rigid, an animal is perfectly free to move; a plant is rigid not only itself, but all its parts in a way are rigid. The only part of the stem which is capable of very much movement is the young growing portion, which, of course, is plastic, and it is consequently almost always in connection with the process of growth that we find the responses to irritability most easily manifested, though it is not so entirely.

The Power of Vision in Plants.

First of all, as to these sensations, the plant has a rudimentary power of vision. Of course it is not what we should expect of a plant in the ordinary condition of things. But what do you mean by vision? In its very rudimentary form it simply means an appreciation of the difference in the amount of light. The man who is nearly blind may be able to see a faint glimmer of light, and so long as he has that power his sight is to a certain extent present. Of course every higher differentiation gives him more and more power of vision, until we get to the complete vision which we ourselves possess; but still you see there are a series of gradations from complete to incomplete, and I think to get to the very bottom we must consider that the power of appreciating differences of light is at any rate a rudimentary vision. In various lowly plants certain of the cells produce very curious little bodies furnished with uncommonly fine, delicate tails. These are the swarm spores, so-called because they come out in swarms from particular cells. When they get into the water in which the plant lives they are found to be always moving about, and so long as the conditions are favourable—so long as their life lasts, that is—they continue to move. If you have a slide of this stage under a microscope, and you watch them moving about, you find them

doing it in a sort of irregular manner; but if you pass a strong beam of light—sunlight preferably—through the slide, they at once alter their movements and take up a very definite position with regard to the beam you are sending in. There are a great many of these organisms which show this power, giving in answer to the stimulus their particular responses. They are endowed with different degrees of sensitiveness. Some prefer a strong light, and go to it, some avoid it as far as possible, and like to get into the shade. This illustrates the point that there is a rudimentary power of appreciating differences of light, and that this power varies in the different organisms. An adult plant has, to a certain extent, the same power. It cannot manifest itself in the form of movement as it can in these swarm spores, but it does so if a change in the direction which the plant assumes while it is growing. The peculiar sensitiveness which we speak of is known in botanic treatises under the name of heliotropism—the power of bending in response to the rays of the sun. When a plant in a growing condition is exposed to a lateral light it seems to be able to appreciate that light, and to turn itself towards it. As an illustration of this, some plants of canary grass were grown in the dark, one saucerful perfectly in the dark, and the whole tendency of the plants in it was to be vertical, to grow upwards. Another panful was grown under a box which had a little hole in one side through which light was able to penetrate to the young plants. The tendency of the plants was to make them bend straight to the window. No doubt those who have indulged in window gardening, as it is called, have seen the tendency plants have to curl over towards the illuminated side and expose their leaves to the light. This is the same thing. Evidently the plants which have grown there have had the power of seeing that window, and they have gone for it. By a consideration of similar experiments to that, we may ascertain a few more facts about this power of vision. In Mr. Darwin's book on the movements of plants he records some experiments he made on this very grass. One of his experiments, illustrates the extreme sensitiveness—the extreme power of vision, if you like—that these small things have:—A pot of seedlings was raised in the dark. They were placed, when they had once begun to grow, in a dark room opposite to a very small lamp at a distance of 12 feet. The light, Mr. Darwin says, was so feeble that when he was in the room he could not see the pot of seedlings by it, and when he had a piece of paper with a pencil mark on it there was not light enough to see the pencil mark, so that you could not accuse the thing of wanting very intense illumination. In $7\frac{1}{2}$ hours from the time when they were exposed to this very small light they had made a distinct curvature in the direction of the lamp. He said they went diametrically for it, so that lines drawn through one of the plants would point to the very centre of the illumination. This is only a very rudimentary form of sight, but still the sensitiveness is certainly comparable with that of the human eye. There is of course no power of complexity of vision, but as far as mere sensitiveness goes it is fairly comparable.

The next point which came out of these experiments is that the sensitiveness is not a general tendency, that it is not a phototonic condition finding its expression in that way, but that a very definite portion of the plant must be stimulated, and another very definite part performs the movement. This leads up to what is the essential feature of the nervous system, the power of interpreting a stimulus and expressing it in the form of changes in some other part of the plant altogether. For instance, an experiment was made in this way:—Some very delicate growing points were covered with little tin caps, the caps were arranged so as not to press upon them or weigh them down, but just to cover the tip, and we found that when the tip was covered one-fifth of an inch from the apex, which is no very great distance compared with several inches of growth, then the plant behaved as if there were no light at all. The one-fifth of an inch was the only sensitive part; if that were left exposed and all the rest of the plant covered the movement went on as at first. In that little portion lies the power of receiving stimulus; therefore one could not go wrong in saying that the little tip had to serve as the sense organ as definitely as the eye of an animal.

With regard to the power of response which the plant has, not to feeble, but to very brilliant illumination, cells taken from the surface of a leaf of *Oxalis*, in their normal condition, have their chlorophyll grains lying in such a position as to expose their broad surfaces and almost the whole number to the incident light, so that the chlorophyll shall get as much light as possible, but under conditions of brilliant illumination we find that they change their position; the sun has caused them, as it were, to get out of its way. They slowly move under a bright illumination, and from some idea of preservation, no doubt, we find them gathered together on the ends of the cells where they get as little light as possible, and instead of presenting their broad surfaces they are turned on their edges. This is an effect which the plant brings about when stimulated by too great a light, a sensitiveness which is, perhaps, not so startling to consider as the former one, but which still has a very definite part to play, and may almost be compared to the effect produced on our own eyes when we expose them to the glare of the sun. Certain other plants protect themselves in a similar way from too intense illumination, not by change in cells in any way, but by turning the edges of their leaves to the incident rays, instead of, as is normally the case, their flattened surfaces.

The Sense of Touch in Plants.

Perhaps the most prominent sense you would expect a plant to possess is that of touch. One can well believe them capable of responding to this. We may subdivide sensitiveness to contact into three heads. We may have an appreciation of temperature—that is a sensitiveness which we of course feel ourselves; we may have appreciation of contact itself without temperature—touch proper; and we may have, again, the appreciation of dampness or moisture. We have all these illustrated in the plant. First, the temperature. Now when temperature falls suddenly, and the plant is in the phototonic condition, a great many plants respond to it in a very peculiar way. They are inac-

curately said to go to sleep; and we speak of sleep movements as attending a fall of temperature, which is coincident with the oncoming of night. Whether it be exactly the fall of temperature alone, or whether it be correlated with diminution of light, is a matter of controversy in some cases; probably both causes conduce to the effect. In the case of the telegraph plant, when night falls the temperature gets low, and, instead of keeping its leaves extended, it assumes a condition in which one droops from the top and folds itself up as much as possible against the stalk. The idea seems to be to try and protect itself from the consequence of a fall of temperature. Another case of a similar character is seen in the *Cassia* when it is brilliantly illuminated and it exposes its leaves to the sunlight, and in the evening we find, in the sleeping condition, the leaves have fallen so as to fold over each other, and to carefully protect the sensitive surfaces from the advent of cold. We must associate this, then, probably in the first instance with the stimulus of temperature, or the appreciation of changes in temperature. In some plants we have the thing brought about more by one, and in others more by the other cause. This sensitiveness is manifested again in a small way in the flowers which open by day and close at night. Take a crocus; in the day it will be open, at night it will close over its leaves, and will, as it were, protect its delicate inner surface. This can only go on a short time, because the growth of the plant is affected, and it only lasts about that time; still, it illustrates the same thing—the fall of temperature, and the movement of the leaf. In *Mimosa* we have a mechanism not connected with growth, but with a peculiar structure, which is generally to be found at the base of the leaf. There is a little swelling there called the "pulvinus," which brings about the changes. In a longitudinal section cut through it, there is a sort of cushion at the back formed of aqueous cells, and another at the top above a stringy woody element passing up the middle. When these aqueous cells on the lower sides are full of water they keep the thing up by the pressure of the fluid inside. As soon as stimulus is brought to bear on the plant some curious change takes place in the living substance, whereby the water is either forced to or allowed to escape. The leaf then not being supported by this succulent cushion, the tissue falls by virtue of its own weight. When it is made to resume its normal position again it is brought about by water re-entering those cells.

(To be continued.)

A PRELIMINARY ANALYSIS OF CACTUS GRANDIFLORUS.

BY GORDON SHARP, M.B. EDIN., LEEDS.

In an article on the pharmacology and therapeutics of *Cactus grandiflorus* in the September (1894) number of the *Practitioner* (see *Ph. J. ante*, p. 253), I showed that the resins contained the little therapeutic value possessed by the drug. At one time it was my intention to separate out and analyse these resins, but after extensive pharmacological and therapeutic trials this idea was abandoned because it would lead to no great practical result.

The results mentioned below were worked out chiefly by myself, in my own laboratory, but some of

the work was also done in the Pharmaceutical Laboratories of the Owens College by Hoseason and myself. Our thanks are therefore due to Prof. D. J. Leech for his kindness in allowing us to carry on our investigations there.

The petroleum ether, absolute ether, absolute alcohol, and chloroform, employed in extracting, were either redistilled or examined by ourselves. Working on several samples of the drug obtained from various sources, we found all to be difficult to powder. No. 60 powder was employed.

I. Maceration and percolation with pure petroleum ether yields 3.634 per cent. of a greenish-brown extract, hardly volatile when exposed for half an hour on a water-bath. It consists of a fat, whose base is not glyceryl, but probably one of the waxy alcohols, and whose acids are palmitic and lauric, with perhaps others. It melts at 38°-5 C. A wax resembling Japan wax (*Rhus succedanea*) is present, and a pigment made up of at least one well-known body—xanthophyll. The pigment is most difficult to get rid of, being found in all the extracts. It was obtained in crystalline form. Glucosides and alkaloids are absent.

II. Maceration and percolation with absolute ether gives 1.940 per cent. This extract is chiefly composed of a series of acid resins and resin anhydride, one or more of which are soluble in 0.75 per cent. sodium chloride solution. These resins probably play the part of glucosides in their pharmacological and therapeutic action. Glucoside and alkaloid are absent. Tannin, and benzoic and salicylic acids were tested for, but could not be detected.

III. Absolute alcohol gives 0.982 per cent. of extract, and is made up of a small amount of resin or resins and colouring matter. Glucosides and alkaloids are found to be absent, but when the extract is boiled for three hours with dilute sulphuric acid, the solution reduces Fehling's solution. This may be due to the presence of some body capable of inversion, or to the presence of a substance of the nature of tannin.

IV. The drug next treated with chloroform gives 1.12 per cent. of yield. This consists of wax, pigment, tannin (or some similar body, although it is difficult to account for its presence after the previous exhaustive treatment). No alkaloid could be detected. After this successive treatment glucosides or alkaloids, if present to any extent, could hardly have been missed.

The dry drug left was found to be highly interesting, and some months were spent in working out the now less important constituents, but professional duties prevent me from writing up the interesting details, and I can do little more than mention a few striking points. As before, glucosides and alkaloids were tried for, but without success; and, for comparison's sake, in each case dilute solutions of glucose and some alkaloid were tested with each reagent.

A watery extract is found to be fluorescent, viscid even when very dilute, and almost devoid of taste. A alkaline solution treated with excess of dilute hydrochloric acid gives no precipitate, showing that

a casein (legumin) is most likely absent; and another portion treated with dilute solution of sodium chloride and then with saturated solution (after filtration), gives no precipitate, showing probable absence of a fibrin. The thick extract does not coagulate on boiling. Alkaline pancreatin, when added to it and kept moderately warm for hours, makes it much less viscid, and the application of caustic soda solution and a trace of sulphate of copper solution gives a dirty pink coloration. It may be that pancreatin can split up the vegetable analogues of animal albumin. Boiled for three hours with diluted sulphuric acid, the glucose resulting from inversion stands only at 0.155 per cent.

Pectin was separated out and found in straw-coloured shining scales, and was present to the extent of 7.58 per cent. Vegetable mucilage was got in light brown scales, and amounted to 7.028 per cent. Cellulose was also obtained in scales, but not free from colour, and gave 2.375 per cent. Cucose could only be got with difficulty, and was calculated by the amount dissolved by boiling caustic potash solution, and was equal to 8.64 per cent. The lignin stood as high as 21 per cent. Starch was sparingly present, but showed a variety of shapes.

The ash reacted to the bases potassium, sodium, calcium, and to sulphuric acid. Nitric, hydrochloric, and phosphoric acids were tested for, but could not be found.

Every point mentioned was gone over more than once, but a complete detailed analysis was not carried out for the reasons already mentioned.

FORMATION AND LOCALISATION OF FATTY AND ESSENTIAL OILS.

M. E. Mesnard has investigated the distribution of fatty and essential oils in a variety of plants. He finds that, except in the case of grasses, they are not localised in special layers of cells, but are found in all the cells of a particular region, such as the endosperm, pulp of fruit, leaf, rhizome, etc. In seeds the albuminous reserve substances have a similar distribution, and there appears to be an intimate relationship between the two classes of substances. They have, however, an entirely independent origin; in fruits, leaves, stems, etc., the fatty oils are not accompanied by albuminoids. The former are produced within the chlorophyllous protoplasm. The disappearance of the reserve oily substances is not the result of the action of any special diastase (saponase). In the seeds of grasses, on the other hand, which may be regarded as oily seeds with an external reserve of starch (endosperm), the starchy substances are assimilated by a diastase (amylase) elaborated in a special epiderm. In the flower the essential oils are usually found localised in the epidermal cells of the upper or under surface of the petals or sepals; in the leaf they are found in the epidermal cells of the upper surface; in the stem and fruit in the epiderm. They appear always to be formed in the chlorophyllous protoplasm, after having passed through the intermediate stage of tannoid substances. In its decomposition, the chlorophyll gives rise also

to other substances, such as tannins, latex, pigments, etc. Hence, white petals, in which the transformation into essential oils has been the most complete, are frequently the most strongly scented; while brown and orange petals, in which pigments have been produced in large quantities, are more often scentless. (*Annales des Sciences Naturelles, Botanique*, 1894, pp. 257-397).

CONTRIBUTIONS TO THE CHEMISTRY OF CERIUM.*

BY W. M. DENNIS AND W. H. MAGEE.

(Concluded from page 378).

IV.—THE HYDROXIDES OF CERIUM.

The peculiar colour changes of the hydroxides of cerium have often been noticed by chemists who have experimented with that element. When any one of the alkaline hydroxides is added to a solution of a cerous salt a white hydroxide is precipitated. This, so most authorities state, becomes slowly yellow on exposure to the air, more rapidly if chlorine or other oxidising agents be present. Popp,† however, claims that he obtained a dirty violet hydroxide by leading chlorine into a solution of a cerium salt precipitated by an acetate. This he claimed to be a higher hydroxide than the yellow. He states that it gave on ignition a red oxide. Others have claimed that his violet hydroxide was a basic acetate. Rammelsberg‡ obtained a like-coloured hydroxide by precipitating a hot solution of cerous ceric sulphate with caustic potash. Hermann§ and Stapff|| also obtained peculiar hydroxides, to which they attempted, without much success, to assign formulas. Later Lecoq de Boisbaudran,¶ by the addition of ammonium hydroxide and hydrogen peroxide to a solution of a cerous salt, obtained an orange-red precipitate, which was studied by Cleve,** who, as a result of his observations, considered it the hydroxide corresponding to an unknown CeO_2 ; namely, $\text{Ce}(\text{OH})_2$.

The following observations may throw some light upon the matter. A solution of mixed chlorides, containing lanthanum, didymium, and cerium was boiled and precipitated, while hot, with ammonium hydroxide. This was done in a large bottle which could be tightly corked. The mixed hydroxides were almost perfectly white, having possibly a faint pinkish tint. After the hydroxides had settled, the supernatant liquid was poured off and the bottle was refilled with thoroughly boiled distilled water. This was repeated until all foreign salts had been removed, the bottle being kept closely stoppered except while decanting and refilling. The hydroxides suffered no change of colour upon standing for some days. Therefore, cerous hydroxide and the hydroxides of didymium and lanthanum when mixed are almost white. Didymium hydroxide by itself, however, or without much intermixture of white hydroxides, has a pinkish colour.

Finally, air was blown through the suspended hydroxides. The colour rapidly changed, at first to a dull purple, and finally to a pale yellow.

Next a solution of cerous chloride was treated in the same manner. The hydroxide remained perfectly white while air was excluded, but, being exposed to air, it took on a dull purple colour, changing later to a bright yellow. Through another similar sample, air freed from carbon dioxide was passed; the same change in colour resulted. Through yet another, pure carbon dioxide was passed. It remained white and did not change to purple even when, after some time, air was substituted for the carbon dioxide, the stability doubtless being due to the complete transformation of the hydroxide to the carbonate. Through yet another sample, air from which both oxygen and carbon dioxide were removed, that is, nitrogen, was passed. It remained white. Next a bottle was about one-sixth filled with cerous chloride, and this was precipitated—white—with ammonium hydroxide, and the bottle was then filled with unboiled water and lightly stoppered. The precipitate changed in colour quite rapidly to light purple, which gradually became darker from above downward, and finally the top began to change to yellow. After about four months the upper third had become yellow, that below it being still violet.

Both the white and the purple hydroxides when washed on filter paper, dried at a low temperature and then ignited, gave an olive-green oxide, which did not become yellow even when the highest heat of the blast-lamp was applied. On powdering it very finely it seemed more nearly yellow. The weights seemed to agree well, however, with that called for by ceric oxide. The yellow hydroxide when dried and ignited gave a pale yellow ceric oxide. When the yellowish-white oxide prepared by this method or by igniting the oxalate is again ignited over the blast-lamp, but in an atmosphere of hydrogen, it becomes olive-green without marked loss of weight. For example, 0.125 gramme of yellow oxide ignited in hydrogen weighed 0.1281 gramme; 0.1574 gramme similarly treated gave 0.1570 gramme. When again ignited in air or oxygen, the oxide became yellow and regained its original weight. Bunsen* obtained very similar results.

As mentioned in a previous section, the precipitate obtained by the united action of ammonium hydroxide and hydrogen peroxide, on being dried and ignited, gives a pink oxide, which seems to weigh somewhat more than ceric oxide, CeO_2 , should.

Another point, perhaps worthy of notice, was that when some of the purple hydroxide was dissolved in sulphuric acid and allowed to stand for a few days there separated out a crystalline sulphate which, on analysis, gave results too high for cerous and too low for ceric sulphate.

It is to be concluded then, so far as the present observations go, that cerous hydroxide is white; that on exposure to oxidising agents, including atmospheric air, it becomes first purple and then yellow, or, in other words, the purple hydroxide is an intermediate product.

* Read before the Rhode Island Section of the American Chemical Society, January 25, 1894. Reprinted from the *Journal of the Chemical Society*.

† *Ann.*, 131, 361.

‡ *Pogg. Ann.*, 108, 45.

§ *J. prakt. Chem.*, 30, 189; 92, 113.

|| *J. prakt. Chem.*, 79, 257.

¶ *Compt. rend.*, 100, 605.

** *Bull. Soc. Chim.* [2], 43, 57.

* *Ann.*, 105, 40.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, NOVEMBER 24, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

THE PROPOSED IMPERIAL PHARMACOPŒIA.

SINCE the publication of Professor ATTFIELD'S paper on the subject of an Imperial British Pharmacopœia, we have received a number of communications in which the project of adapting the Pharmacopœia to all parts of the British Empire has been discussed from various points of view. These communications were not intended for publication but rather as attempts to arrive at a definition of the idea embodied in the project of making the British Pharmacopœia as applicable for its particular purpose in remote colonies as it is in the United Kingdom. Until some action had been taken by the Colonial authorities requested by the General Medical Council to report upon this matter it would have been premature to offer any remarks upon it. But after the publication of the report presented by the Victorian Committee some of the recommendations there put forward may be made the basis of comment.

The first recommendation is that, in regard to certain drugs which are the produce of plants growing or capable of being grown in Victoria, the present restrictions as to the places of growth and preparation shall be removed so far as Victoria is concerned. Among the medicinal plants mentioned by Baron von MUELLER of plants in the list given growing satisfactorily in the colony of Victoria areaconite, belladonna, digitalis, henbane, hemlock, ed poppies, and squirting cucumber, as well as lder, horseradish, and valerian. It appears reasonable that the medicinal drugs obtained from these plants growing in the colony should be applicable for pharmaceutical purposes, and in some instances, indeed, it would be essential that they could be so, as in the case of fresh leaves and other cash parts of plants. In regard to rhubarb and opium the propriety of admitting the use of Victorian produce is not so clearly evident. But in all these instances permission to use native drugs would not

require removal of the restrictions applying in the United Kingdom. It might be provided for by a special supplementary regulation applying only to the particular colony. In the case of essential oils which are now officially directed to be "distilled in Britain," there may be, for other reasons, sufficient ground for removing that restriction, provided the definition of the several oils by characters and tests, were so far improved as to render their identification practicable.

The official limitation of opium to the "produce of Asia Minor" might be objected to as unreasonable in view of the fact that opium containing as large an amount of morphine can be also abundantly produced elsewhere. But that objection would involve the assumption that morphine is the sole active medicinal principle of opium, and a disregard of the firmly established medical opinion that the action of opium is not fully represented by that of an equivalent quantity of morphine.

The fifth recommendation to omit certain drugs and preparations now included in the Pharmacopœia relates to matters which are outside the province of the pharmacist, and they must be decided from the medical point of view. But whatever may be the opinion held in Australia, it is certain that several of the drugs and preparations now referred to as being unused there and unnecessary are in constant use in Britain, as, for instance, spirit in therapeusis armoraciæ co., oleoresina cubebæ, emp. calefaciens, cinchonidine, and ext. tarax. liquid.

The drugs and preparations specified in Appendix D as being suitable for insertion in the new Pharmacopœia are most of them in every day use, and many of the preparations have been adopted in the unofficial formulary of the British Pharmaceutical Conference. But before coto bark or β -naphthol are adopted as articles of the official materia medica of an imperial pharmacopœia it would be desirable to have some better knowledge of their medicinal value than is at present possessed. From the pharmaceutical point of view a glycerinum acidi borici would be more suitable for introduction as an official preparation than "boroglyceride," as suggested, and the preparation might, perhaps, be substituted for the present glycerinum boracis.

The pharmacy of eucalyptus preparations might well be amended, but the oil and mucilage suggested in the formula for syrup. eucalypti rostratæ appear to be unnecessary additions, and the suppositories made according to the formula given for suppos. eucalypti rostratæ would be more properly named suppos. nucis vomicæ. It is not evident what advantage would be gained by making the ointment of eucalyptus with the fresh leaves in place of the oil as at present.

If all the colonies suggest as many alterations as Victoria has done, the work of revision will be very materially extended, and its difficulty in-

creased. Having regard only to the additions which have been suggested as desirable, it may be feared their adoption would render the *Pharmacopœia* unnecessarily voluminous, while some of them would be better suited for a text book. The more, therefore, the project of making the *Pharmacopœia* applicable to all parts of the British Empire is considered, the more it becomes apparent that this adaptation may most conveniently be made in the form of supplementary provisions for the special requirements of the several colonies.

THE DANGERS OF LEGISLATION.

THE editor of the *Canadian Pharmaceutical Journal* refers, in the November issue of that publication, to the result of the ARMSTRONG case in England, and writes in terms of approval on the decision that the sole right to vend proprietary medicines containing poison, in Great Britain, remains vested in registered pharmacists. He then proceeds to contrast the different state of affairs prevailing in Ontario, where the outcome of somewhat similar proceedings has been practically to ruin the local Pharmacy Act.

That Act was based on the British Act of 1868, and possesses the same merits and defects as the latter, and it is pointed out that, if the Council of the Ontario College had acted as wisely and energetically as the Council of the British Society, the condition of things might have been equally fortunate. The main result of the Eaton prosecution—which was referred to in the *Pharmaceutical Journal* for October 22, 1892, and in which it was sought to obtain penalties from a limited liability company for the sale of chlorodyne—was to lead to the legal exemption of proprietary medicines from the operation of the Ontario Act.

A conviction was obtained in the Eaton case, but public opposition had been aroused, and when, subsequently, an attempt was made to pass an amending Bill to the Ontario Act through the Legislature, it was passed with the addition of a clause which entirely prevented the application of the original Act to the trade in patent (proprietary) medicines, and privileges were thus lost which had only been secured by years of persevering effort. The attempt to amend the Act is said to have aroused the opposition of the Colonial Government, the press, and the people, and resulted in a strong feeling against class legislation in general.

British pharmacists may profitably ponder over this unlooked-for effect of seeking to gain extra parliamentary powers, and after reflection they may decide that in such matters it is desirable to hasten slowly, making certain of the soundness of their case before putting it to the test. It is also a good thing to investigate the state of affairs generally, elsewhere than in Great Britain, and to

that end we propose next week to contrast the condition of pharmacy at home and abroad, especially in the colonies and other English-speaking communities.

THE T. C. W. MARTIN TESTIMONIAL.

MANY of our readers are probably aware that an influential Committee has been formed to present Mr. MARTIN with a testimonial, to indicate in a practical manner how much he is esteemed and respected by those with whom he has come in contact during the many years he has represented the well-known house in which he has recently completed fifty years of honourable service. We understand that the response has been very satisfactory.

The Committee has decided that the testimonial shall take the form of a purse and an illuminated address bearing a list of the subscribers. The presentation by Mr. E. N. BURT, Chairman of the Committee, will take place on Wednesday, December 5, at 6 p.m., in the Hall of the Pharmaceutical Society, 16, Bloomsbury Square, by permission of the Council. Subscribers and friends, ladies as well as gentlemen, are invited to be present.

The fund will close on November 30, by which date it is hoped that those subscribers who have not remitted the amount of their subscription will forward it to Mr. M. CARTEIGHE, Treasurer, 18 New Bond Street, W.; or Mr. F. BANKS, 25 Braxfield Road, Brockley, S.E.

COLONIAL AND FOREIGN ISSUE.

THE *Journal* of Saturday next, December 1, will have a wide circulation throughout the Colonies, and it has, therefore, been thought a fitting opportunity to publish articles comparing the condition of pharmacy at home and abroad, and other points of the approaching revision of the British *Pharmacopœia*. Information published in this number of the *Journal* will reach some five thousand individuals connected with pharmacy in various parts of the world, who do not usually receive it. We would remind our readers that notices, etc., for publication next week should arrive not later than the first post on Wednesday morning, November 28, and advertisements should reach the office, 5 Serle Street, Lincoln's Inn, W.C., as early as possible during the same day.

TEMPORA MUTANTUR.

A REPORT of the proceedings at the first meeting of the new session of the Royal Society appeared in the *Times* of last Saturday, with brief abstracts of the papers read at the meeting. This is the first indication of a new departure, which shows that the necessity for adaptation to progress has been observed even by so powerful an institution as the *Times*.

HOSPITAL PHARMACOPŒIAS.

THE necessity for the existence of hospital pharmacopœias, as urged by a correspondent in the present issue of the *Journal*, is of course a real one, so long as limited dispensing staffs are employed in hospital dispensaries. At the same time, however, such pharmacopœias ought to be limited in size, embracing only the commonest remedies, and not attempt to compete with the general standard—the British *Pharmacopœia*. As indicated by the review

of one such work on page 430 grave mischief may take its rise from this tendency to unduly comprehend much that is elsewhere provided for; and in such cases, if, as Mr. HARVEY suggests, the use of hospital pharmacopias "is more often honoured in the breach than in the observance," the general advantage will certainly more than compensate for the seeming neglect.

BEESWAX AND PARAFFIN.

We understand that in consequence of the frequent occurrence of wax containing a more or less considerable proportion of paraffin, the attention of the authorities charged with the administration of the Food and Drugs Act has been directed to this matter, and that samples of white wax have been obtained for analysis. It may be suggested that the modern practice of assisting bees in the production of honey, by supplying their hives with artificially prepared foundations made of solid paraffin on which to build the honeycomb, would appear to have become very general, and to have been attended with the unexpected result of introducing into much of the beeswax met with in trade an admixture which may be regarded as an adulteration. If that be the case, the fact might possibly account to some extent for the presence of paraffin even in white wax, but in any case chemists will require to satisfy themselves of the purity of this article, which would be regarded as a drug when supplied by them.

WESTERN CHEMISTS' ASSOCIATION OF LONDON.

The opening of the new session was inaugurated by the members of this Association and their friends, on Wednesday evening, when the annual dinner was held at the Café Royal, Regent Street. The chair was occupied by Mr. ANDREWS, the retiring president, and between sixty and seventy were present, including Messrs. C. B. ALLEN and W. MARTINDALE, members of the Pharmaceutical Council, Dr. LUFF, Dr. PAUL, Mr. RICHARD BREMERIDGE, and others, the number being larger than on any former occasion. At the conclusion of the dinner, and after the usual loyal toast, the chairman proposed the "Success of the Western Chemists' Association of London," and coupled with the toast the name of Mr. R. H. PARKER, the new president. In a brief but well-turned speech, Mr. PARKER referred to the rapid growth of the Association, which, after only six years of existence, included more than one hundred and thirty members. Afterwards, in proposing the toast of the "Pharmaceutical Society," Mr. PARKER spoke of the necessity of supporting the Pharmaceutical Society, which, he said, should include every registered chemist. In this way only could the Society influence legislation satisfactorily, and effect the utmost good for its members. Mr. C. B. ALLEN, in responding, described the difficulties under which the Council of the Society laboured, and referred to the extreme loyalty to the Society manifested by the Association. Other toasts followed, being interspersed with recitations and songs. Altogether, a very pleasant evening was spent, and the Association—which might well consider the desirability of changing its style to the London Chemists' (or Pharmaceutical) Association—because of its representative metropolitan character—is to be congratulated on the favourable auspices under which it has commenced another year's work.

MISCELLANEOUS NOTES.

The opening of the Pharmaceutical Society's new Hall and Laboratories in Edinburgh, will, as previously announced, be celebrated by a dinner of Scottish pharmacists, to be held on Thursday next at the Royal Hotel, Edinburgh, at 6.30 p.m., and a conversation at the Society's House, 36, York Place, on the following day, at 8 p.m.

In the list just issued of the successful candidates at the recent examination for the B.Sc. degree of the London University appears the name of Mr. H. HOLBECH. Mr. HOLBECH, who served an apprenticeship in pharmacy with Mr. PERRY, pharmaceutical chemist, of the Hagley Road, Birmingham, was an old student of the Midland Institute in that city, taking thence a scholarship to the Royal College of Science, South Kensington. He is now one of the lecturers in chemistry and physics in the School of Science, Leeds.

The Annual Smoking Concert of the Pharmaceutical Football and Cricket Club will be held on Tuesday, December 11, at the Holborn Restaurant. Professor GREEN, Sc.D., Dean of the School of Pharmacy, will take the chair at eight o'clock and be supported by other members of the teaching staff. All former students of the School of Pharmacy are invited to be present. Tickets, one shilling and sixpence each, may be obtained from the Secretary, Mr. T. TICKLE, 17, Bloomsbury Square, W.C.

The Christmas course of lectures adapted to children, at the Royal Institution, will be delivered by Professor J. A. FLEMING, F.R.S., Professor of Electric Engineering in University College, London. The subject will be, "The Work of an Electric Current," and the first lecture will be delivered on Thursday, December 27, at three o'clock.

ACCORDING to Professor CROOKSHANK no less than 721 students, mostly qualified medical practitioners, have been instructed in bacteriology at King's College since the foundation of the bacteriological laboratory in 1886, the entry for last year amounting to 171.

A SPECIAL meeting of the Glasgow and West of Scotland Association is to be held on Wednesday, November 28, when the President of the Pharmaceutical Society, Mr. M. CARTER, will be present by invitation and address the members.

The inauguration of the 141st session of the Society of Arts took place on Wednesday evening at the Society's Rooms, John Street, Adelphi, when the Chairman of the Council, Major-General Sir JOHN DONNELLY, K.C.B., delivered the opening address. In this he suggested that, following up its past work in promoting technical instruction, the Society of Arts should take the initiative in establishing unity of action among the various bodies now endeavouring, in a partial manner and at some disadvantage, to carry forward that important work.

The new volume of the British Pharmaceutical Conference proceedings, including the usual abstracts of papers in pharmacy, materia medica, and chemistry has just been published.

Transactions of the Pharmaceutical Society of Great Britain.

EVENING MEETING IN LONDON.

The first ordinary meeting of the Session was held on Wednesday, the 14th inst., when the chair was taken at 8 p.m. by the President, Mr. Michael Cartelghe, who at once called upon Professor Green to give his lecture on

"THE NERVOUS SYSTEM IN PLANTS," a full report of which will be found at page 413.

At the conclusion of the lecture,

The PRESIDENT said the meeting was not competent to discuss it, but he was sure that if anyone present wished to put a question Professor Green would be kind enough to answer it.

A member asked if it were not the fact that after a *Drosera* had made what use it could of an insect, it threw out the *débris* from the plant?

Professor GREEN said the tentacles expanded again, and the prey was abandoned, but there was no active rejection of it.

The PRESIDENT then proposed a hearty vote of thanks to Professor Green for his admirable lecture. The matter, as was always the case, was good, but he thought no previous discourse had been given with such exquisite simplicity. The elder members, as well as the students, felt it a great pleasure and privilege to have the opportunity of listening to such a lecture.

The motion having been carried by acclamation,

Professor GREEN thanked the meeting for the patience with which they had listened to his brief exposition of a subject which was of great interest to himself, but which he had feared would not be so interesting to others.

The proceedings then concluded.

Proceedings of Societies in London.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

The first meeting of the session was held on Thursday, November 15, Professor Attfield, F.R.S., President, in the chair. After the reading of the minutes, and some opening remarks by the President, Mr. Hampson delivered the following address:—

INTRODUCTORY ADDRESS.

BY ROBERT HAMPSON.

Treasurer of the Pharmaceutical Society.

In accepting your President's invitation to address you, at this, the opening meeting of the 20th session of your Association, I felt that I might be able to say something, if but little, not quite unprofitable or unworthy of your hearing. An Old Boy's ideas and thoughts, given after life's meridian is passed, may carry a certain weight and guidance, if only to give a friendly encouragement and a friend's greeting. You, my young friends, who are pressing forwards towards the arena of active life, remind me of a fleet of trim-built ships leaving a landlocked harbour for the great ocean beyond, every one with his own rudder and compass to guide and give him a safe and prosperous voyage. An old proverb says that "In a calm sea every man is a pilot."

It is, however, well to remember that both captains

and pilots are of use only when trained and experienced, and that training and skill come by buffeting and storms.

For a few transitory minutes then, this evening, allow me the privilege of occupying the position of a temporary pilot, as well as a friend. I certainly have been buffeted; I have felt also the impact of sundry storms.

It is not fitting, and it is certainly not necessary, that I should offer you particular advice with regard to the special studies appertaining to the calling you have chosen; safer counsel you can readily obtain from the distinguished professors of the School of Pharmacy. I desire rather to inspire you with a genuine student's glow and devotion; to help you to realise at its full value the time most opportune, with which you will deal whilst spending the few fleeting months at 17, Bloomsbury Square, and as members of the School of Pharmacy Students' Association.

I suppose most of you have left your homes some distance away from this big labyrinth of London. To each of you personally the time spent, and to be spent, here in the development of your minds, is of greater import than the discovery of America by Columbus, or any other great but impersonal event recorded in the history of the world. An American poet expresses my meaning thus:—

"Small is the theme of the following chant, yet the greatest—namely, one's self—that wondrous thing, a simple, separate person."

You are bent upon study, upon work, for you are all members of your own Association; this I regard as a sign and guarantee for you all of mental thrift and earnestness of purpose.

The special object before you is doubtless the polishing of your mental weapons, wherewith you may, with due dignity, cut your way through the examination room, in spite of the considerate but grim examiners waiting there for you. You desire, however, not only to creditably pass your examinations, but also to make a goodly crop of brain-impressions in the sowing of your knowledge seed, which may serve as a basis for future mental work. Every real student is a real student always!

"Unto him who works and feels he works,

This same grand year, the golden year, is ever at his doors."

The structural basis of the mind and character is a grave and established fact in human knowledge. "The most universal quantity is diversity." So said Montaigne many years ago, and he was right. Amongst you all there are not two of you alike in face, in voice, or figure. There are not two of you of the same mental and bodily potentiality; you are all and each of you "separate persons," of distinct individuality, and of different mental poise and calibre.

If you started in life—in student life—equally poised, and with equal mental calibre, you might run an equal course—provided your environment remained the same. What an uninteresting and strange set of beings you would be under such impossible conditions and circumstances! Something like an ordinary row of poplar trees in a Dutch garden, of exactly the same

height and character and growth. One would want to cut them down to get them out of sight!

It is the motley element in mankind and in nature from which beauty and interest and development and originality proceed. If we were all alike, all out of the same block, the effect on the mind would be like listening to one dull musical phrase, and only one; and the result utter stagnation and a dead world!

So to every person his own special personality is of paramount interest and necessity.

He must grow his own seed, he must enrich his own mental soil, prune his own mental growths, out down relentlessly any wild weeds which, having grown, would endanger and becloud his mental health and purity. To use a homely saying, "he must paddle his own canoe!" "He must hit the ball from his own bat!"

Whilst impressing upon your attention this view of mental growth and development, which to some minds presents an aspect of life almost too sombre for satisfaction, I must remind you that it harmonises with nearly all, if not all, philosophies and systems of ethics the world has yet produced. You remember well the parable of the sower?

Make then the best of yourselves—no second best will do—and leave nothing to so-called chance and to opportunities which may never come. The present is your great opportunity, and for the time being the greatest—to be seized with both hands. You need not fear stocking your minds too well whilst your powers of digestion are good and vigorous. Nothing you will find to be valueless, the smallest and least interesting act in science or life is worth knowing.

In my early student days there were some things I found difficulty in understanding and remembering, and fits of despair at times crept in upon me. But now, surprising the experience of the coming day! After having had another set-to in the freshness of the morning my fears evaporated in sunshine, and hope mewed.

So it will be with you, when difficulties like dead ails rise before you, and only your own concentrated ill-power directed against the obstacle will enable you to pierce the barrier. But what are the after effects of honest effort so expended, when your best efforts have been engaged in conflict?

A sense of no ordinary joy and of triumph will fill our hearts, and best of all, besides the good storage of knowledge gained, is the increase of mental strength and pliability ready to serve you well at the next encounter.

I have said that you differ from one another, that there are diversities of talent in all the men and women born into this wonderful world of ours. A few of you may possess exceptional mental gifts ready to be used apparently against all difficulties, and capable of much development. I have known such individuals on whom fortune had cast many favours and as many duties. I remember several in my student days, now studying for the medical profession. My experience tells me now that they were not always the most successful students, and their after careers in many instances belied wofully the promise of their

youthful days. The less gifted man often overtakes the one who might easily win in the scholar's race; it is he who plods, who never knows when he is beaten who is able to sharpen well his less brilliant talents.

It is the persistent worker who most frequently makes the successful student. There is hope therefore for you all, and success for you all, in proportion to your deserts and endowments.

Let nothing stand in the way that you can remove that will interfere with or retard your progress or your success as loyal students and well-equipped pharmacists. Do not be satisfied with the Minor diploma of your profession, but press forward to the Major qualification, and far beyond that if you have the opportunity.

If by chance, or rather as a result of well-directed study and a true student's ardour, you develop faculties to a degree that may carry you outside the confines of pharmacy, I do not think anyone need utter a complaint. We may hope that in these instances science may be the gainer if pharmacy appears to be the loser.

One of the most remarkable and instructive examples, clearly demonstrating to the world that nothing is gained by indolence and immaturity, and that nations, as well as individuals, demand and require cultivation if success in life be the aim. It is the conflict startling the nineteenth century and giving object lessons to Europe, between the lively little Japs and the heavy conservative Chinese. The Japanese, both rulers and people, believed in a "curriculum"; almost the entire nation went to school and learned the arts of both peace and war. They adopted modern ways and modern ideas of government, and both princes and people sent their young men to Europe to be trained in law, literature, science and handicrafts, as well as the most modern and refined methods of hateful war. The Chinese, although they established a system of competitive examination for filling of the Government appointments centuries ago, they examined each other in the obsolete and stereotyped knowledge of past ages. The nation as a whole, both rulers and people, remained immovable, and held themselves aloof from the influences of real culture and progress, scorning other nations as outside barbarians. They will be a mighty nation, for their numbers are almost countless, when they turn over in their sleep and wake up to assimilate modern ideas. I hope the war is nearly over, and that the Japanese may know when it is wise to cease hostilities, and once more return to cultivate the arts of peace, for the game of war is a costly game to play at.

It is another example of life's little ironies to learn that in the disinfection of Hong Kong during the recent visitation of the plague the chlorinated lime and sulphuric acid employed were imported from and manufactured in Japan, and they are described as being of excellent quality.

I wish, if you will allow me, to urge upon you the necessity of becoming careful and expert users of your hands, exact and patient manipulators and experimentalists. It is gratifying to find that you have a department in your Association devoted to re-

search work, and much may come out of it that is good and meritorious.

I have often thought that the handicraftsman, the expert worker in metal and other media, serves by example to teach us many a useful lesson. How marvellously trained some of them are, and how independent their labour makes them.

I daresay you are aware that the young men of the royal family of Prussia are trained in some kind of handicraft. I think the present Emperor, or was it the much lamented Emperor Frederick, became an expert worker in gold and silver. It is a great and good thing to have "an honest passion for perfect work." The Danish proverb runs thus: "A good handicraft rests on a golden foundation."

There is a most useful gift you all possess to a certain degree, though it may be a slumbering one in some of your minds, which I advise you to cultivate, as it brings with it both pleasure and profit, as well as the power of accurate observation. For this purpose carry with you always a small piece of lead pencil and a very small sketch book. I refer, of course, to the art of drawing correctly any object you may wish to impress upon your memory.

In the course of a very short time, if you cultivate this gift, you will be surprised and delighted at your progress in the graphic art. With a growing knowledge of what is called the value of line, which the use of your pencil will give, you will at length realise the glory of the sense of colour, as well as of form, in the objects presented to the eye, and, lastly, the love of the beautiful ever present in nature, be the objects great or microscopic. The wonder of the art ~~serve~~ will be found, and when you have learnt to look upon nature with educated eyes she will become your most devoted friend, servant, teacher, and companion, ever present with you.

You will begin to think, perhaps, that I have wandered some distance away from the immediate object that is before us this evening; yet I have only given brief expression to a few time-worn ideas, which, I imagine, are quite relevant to this the opening night of another season of your Association. Not content only with the work you are doing at the School of Pharmacy, which brought you to this historic building, you are prepared to band yourselves together in a fraternal spirit that you may give encouragement to one another, as well as add to your stock of knowledge and experience. May I be allowed to express the hope that the new session will be in every way successful; that you will gather all the students of the school within your ranks, and that the old members of the school, wherever they may be, may recognise your efforts and join hands with you in usefulness and good comradeship.

When the session is over and you have stayed at No. 17, Bloomsbury Square, as long as circumstances permit you to remain, and you sally forth to undertake the various duties of the different careers opening out before you, you will not forget the friendship of your comrades and the loyal service due to pharmacy and to the Pharmaceutical Society. I heartily wish you each and all the certain success which follows

real, honest work, and the happiness which comes to all who live useful and faithful lives.

To conclude, let me quote from a French writer now passed away:—"The happiest of men were he who, understanding his craft and working intelligently with his hands, and earning competence and freedom by the exercise of his wits, found time to live by the heart and by the brain, to understand his own work, and to love the work of God."

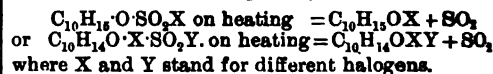
At the conclusion of the address a vote of thanks to Mr. Hampson was proposed by the Chairman, seconded by Mr. Joseph Ince, and carried by acclamation.

The election of officers was then proceeded with, Messrs. H. L. Lee and S. Bastow being appointed as scrutineers to count the voting papers with the Secretary. The result of the election was that Messrs. I. A. Henry and H. T. Durant were chosen as Vice-Presidents; Mr. F. W. Short as Secretary and Treasurer; Mr. C. S. Ellis as Assistant Secretary, and Messrs. H. Brown, S. Davis, J. R. Walker and J. G. I. Stoddart on the Executive Committee.

The meeting then adjourned.

CHEMICAL SOCIETY.

A meeting was held on Thursday, November 15, the President, Dr. Armstrong, F.R.S., in the chair. The minutes of the former meeting were read and confirmed and the names of a number of candidates for election into the Society read, the arrangement adopted at the previous meeting being followed. Mr. A. E. Tanner was formally admitted a Fellow of the Society. The President then called on Mr. Pope to give an account of work done on the haloid derivatives of camphor by himself and Dr. Kipping. When the derivatives of camphor containing the sulphonic and haloid radicals, as heated, sulphur dioxide is given off and a haloid derivative left. In this manner several new haloid compounds were formed, such as chlor-, brom-, chlorbrom-, dibrom-, and dichlor-camphor, by one of these reactions:



where X and Y stand for different halogens.

He briefly described these bodies, some of which exhibited curious properties, e.g., existing in different crystalline form, and exhibiting stereoisomerism.

Dr. Armstrong then called on Dr. Perkin, *Jr.*, F.R.S., who—though not often seen at Burlington House—is well known to all chemists on account of his masterly researches on trimethylene and its homologues, to give some account of his recent work on this subject.

Dr. Perkin first gave an account of the preparation of certain compounds used in the study of these derivatives, and then gave in a very clear and lucid manner some reasons for viewing these bodies as ring compounds. In favour of this view he adduced the fact that the ring was easily broken by hydrogen bromide in trimethylene compounds, less so in tetra- and hexamethylene, and not all in the pentamethylene group.

This fact is in accord with theoretical considerations deduced from the linking of the carbon atoms in the molecule if their affinities are exerted towards the corners of a tetrahedron as stated by Le Bel and Van T'Hoff.

He also gave a description of the existence in two isomeric forms of ortho-hexahydrotrilic acid, 1,2,—C₆H₁₀·CH₂·COOH, which isomerism is probably similar to that of fumaric and maleic acids, being the so-called *cis*- and *trans*-modifications. The last paper

read was by Dr. Kipping on dimethylpimelic acid, $(CH_3)_2(CH-CH_2-COOH)_2$. In this case an attempt to clear up apparent discrepancies concerning the melting point of the acid as prepared by different observers led to the conclusion that this acid also exists in two isomeric modifications corresponding to the cis- and trans- modifications above mentioned.

Certain papers having been taken as read, the meeting adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The annual conversazione of the eighteenth session was held at the Portman Rooms on Thursday, November 15.

The exhibition included a collection of physical apparatus lent by the Pharmaceutical Society; aluminium dishes, water baths, balances and cases, also glass condensers and flasks for the cultivation of bacteria in different gases, by Messrs. Townson and Mercer; a laryngoscope, portable batteries, and a new form of metal thermometer case, by Messrs. Mayer and Meltzer; microscopes, micrometers, mounted specimens, and cultures of bacteria, by Mr. W. H. Symons; a specimen of lemon juice sterilised by filtration through a kieselguhr filter, a vaporimeter for the determination of the amount of alcohol in beverages, and a polariscope, by Messrs. Idris and Co.; a micro-photographic camera, several microscopes and slides, by Mr. Charles Baker; a collection of mounted microscopic objects, by Mr. E. M. Holmes.

The photographic section was well displayed, and attracted most attention, a fine display of photographs and enlargements being made by the Eastman Photographic Co.; Messrs. Underwood, Pasco, and Son; and Messrs. Perken, Son, and Rayment. Photo-tabloids and pictures developed and toned with them were exhibited by Messrs. Burroughs, Wellcome and Co.; Messrs. Platt exhibited their portable "Citos" oxyhydrogen science lantern, an extremely compact and substantial instrument, also a lantern with mahogany body, adapted for use with gas or oil; and Mr. G. S. Pasco showed his prize landscapes on the "mezzotype," and two groups of members taken on the "Sunday outings."

The concert commenced shortly after 9 p.m. It was arranged by Mr. H. H. Robins, and was much enjoyed. Dancing was in full swing by eleven o'clock, and was engaged in by an unusually large number, Mr. T. C. W. Martin acting as M.C. Supper was served at an early morning hour. The President (Mr. R. H. Jones) proposed "The Ladies," and Mr. Martindale "Long Life to the Chemists' Assistants' Association, and Success to its Conversazione," both toasts being drunk with enthusiasm. The company dispersed about 4.30 a.m., after one of the most successful meetings recorded.

Provincial Transactions.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

SOCIAL MEETING.

The smoking concert following the business meeting the Manchester Pharmaceutical Association held last week was very successful. Mr. Alderman Robert Gibb, J.P., ably fulfilled the duties of chairman, and there was a large muster of young and old knights of the pestle. A long and varied programme—quartets, solos (sentimental and comic), and recitations—afforded unqualified pleasure. Commencing a few minutes after nine o'clock, it continued with only one interval till the hour of midnight struck, when the company joined heartily in singing "God Save the Queen," and thus ended a very pleasant evening.

PLYMOUTH, DEVONPORT, STONEHOUSE AND DISTRICT CHEMISTS' ASSOCIATION.

LIST OF DONATIONS.

At the last committee meeting of this Association, the Secretary, Mr. James Cocks, announced the receipt of the following donations:—Five cases of specimens, from Messrs. Jackson and Co., Plymouth; original prescriptions, from Mr. Walter Hills, Messrs. Corbyn and Co., and Messrs. Wilcox and Co.; two specimens crystals in glass vases and Lescher's "Materia Medica," from Messrs. Evans, Lescher, and Webb; Ganot's "Physics," "Dispensatory, U.S.A.," "Antiseptic Treatment of Wounds" (Cheyne), "Commercial Handbook of Chemical Analysis" (Norman), Royle's "Materia Medica," Leonard and Christy's "Dictionary of Materia Medica," from Mr. H. J. Dalgleish (Messrs. Ford, Shapland, and Co.); musk pod, from Mr. C. J. Park; "Materia Medica" and two habitat maps, from Mr. G. S. V. Willa.

JUNIOR SECTION.

A smoking concert in connection with the above was held at "The Farley Hotel," on Wednesday, November 21, the chair being taken by Mr. C. T. Weary at 7.30 p.m., and the majority of the members of the senior section being present. A most enjoyable evening was spent, the programme reflecting great credit on the committee (Messrs. Goodwin, E. H. Newman, H. O. Westcott, and C. Wood). The following gentlemen took part in the proceedings:—Messrs. J. D. Turney, C. T. Weary, Barker, J. E. Bone, Mash, White, E. H. Newman, H. O. Westcott, C. Wood, J. H. Bailey, A. Barber, G. Keast, Yeo, Morgan, R. F. Roper, and Harris. The balance remaining after payment of expenses, together with a collection made in the room, was forwarded to the Benevolent Fund.

CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

At a meeting held on November 9, Mr. A. Sidney Campkin, M.P.S., J.P., being in the chair, and a good number of members being present, Mr. A. Ivatt, M.A., of Christ's College, and lecturer in Pharmaceutical Chemistry in the University, gave a paper, of which the following is an abstract:—

SOME DISPENSING ERRORS.

BY A. IVATT, M.A.

The errors to which dispensers are liable may be divided into two main classes; first, those in connection with the prescription itself, and, secondly, those which occur whilst compounding the medicine.

Every dispenser before compounding a prescription should feel certain that he understands the physician's intentions, and, also, the dispenser is in error if he fails to detect a mistake of the prescriber, such as the writing of the sign $\bar{z}$ instead of $\bar{3}$. It is, perhaps, needless to point out that bad writing and contractions on the label should in all cases be avoided. The dates of prescriptions should be noted, as many still in use in old families were written in the time of the Ph. Lond. For instance, liq. morph. of the B.P. contains only half the amount of morphine of the Ph. Lond. preparation.

In considering the second class of errors, Mr. Ivatt strongly urged that inorganic substances be chemically tested and organic substances carefully examined before being placed into stock from the wholesale houses. He also spoke of the liability of giving a larger dose of the drug than is intended, e.g., liq. strychninæ crystallises on the lip of the bottle, and the alkaloid is liable to come away with the liquid

when measured if the bottle is not first wiped; while, on the other hand, a very small, or even useless, dose may be given by want of attention to the keeping of drugs, for instance, *ac. hydrocyan.*, *ac. sulphur.*, and *ferr. redact.* The lecturer also spoke of other errors one is liable to fall into, such as the use of the *avoirdupois* instead of *troy ounce*, improperly balanced scales, the measurement of minims of potent liquids, the imperfect graduation of bottles, etc.

In conclusion, he pointed out that to avoid great errors it is important to take care to avoid small ones. Arrangements of bottles, systems of checking, and mechanical appliances do much, but will not prevent the careless or ignorant from falling into error; but he who continually strives to add to his stock of knowledge and is habitually precise in small matters, does as much as lies in the power of any human being to avoid the errors to which dispensers are most liable.

A very interesting discussion followed, in which several members joined, giving some of their own experiences and instances which had come under their notice.

After the usual votes of thanks the proceedings terminated.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The first monthly meeting of the session was held in the Society's rooms, New Surrey Street, on Wednesday, November 14. The President, Mr. J. F. Eardley, occupied the chair, there being a good attendance of Members and Associates. After the transaction of some preliminary business, Mr. Ibbitt read a paper, of which the following is a very brief abstract:—

RAMBLES ROUND SHEFFIELD.

BY H. R. IBBITT.

Commencing with the geological formation of the district, reference was next made to the many pieces of woodland which are, to all appearance, remains of the primeval forest which once covered all the lower valleys of the Don and its tributaries, and to the moors, which, though much curtailed by the advance of cultivation, still occupy extensive tracts of country.

The various features and points of interest in the valleys of the Don, Loxley, Rivelin, Porter, and Sheaf and of the hills which rise between them were described, as well as more extended walks. Interesting legends in connection with many of the places were narrated, and, in conclusion, reference was made to the variety of the botanical specimens to be obtained in this most interesting and attractive neighbourhood.

At the conclusion of the paper a long discussion took place on the subject, in which Messrs. Austin, Ellinor, Hewitt, Marshall, Newsholme, and others took part, after which a vote of thanks was passed to Mr. Ibbitt for his interesting paper.

SHEFFIELD MICROSCOPICAL SOCIETY.

The first general meeting of the above Society was held on Friday, November 16, in the Rutland Institute, Fargate. The Rev. T. S. King, F.G.S., F.R.M.S., occupied the chair. The Hon. Secretary (Mr. Newsholme) read the report of the last session, which showed the Society to be in a most flourishing condition. Much real and lasting work is being done by this Society, and the members (now numbering over one hundred) are entering on the new session with fresh zeal for microscopical endeavour.

The inaugural address was then read by Dr. Hall, M.A., M.R.C.P., who in a concise and interesting way proceeded to deal with the five special senses found in mankind, dwelling at some length on the sense of sight. It was encouraging, he said, to see such a goodly number congregated together who took such a lively interest in microscopical work.

On the motion of Mr. C. O. Morrison, seconded by Mr. Jenkinson, a hearty vote of thanks was accorded to Dr. Hall for his most valuable address.

A ballot took place, and four gentlemen were elected to membership.

Scottish Transactions.

EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.

The opening meeting of the 17th session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, November 14, at 9.15 p.m. Mr. Alexander Sutherland, President, in the chair, and there was a large attendance.

The minutes of last meeting were read and approved, and several apologies for absence were intimated.

The Secretary then read the report on the Association Prizes' Competition. Six candidates had entered, and the prizes were awarded as follows:—First Prize (a class ticket for Dr. Stevenson Macadam's Lectures on Chemistry) to John Harris Burns, 73, Princes Street, with 80 per cent. marks; Second Prize (British Pharmacopoeia and Gerrard's *Materia Medica*) to Alexander Mackenzie, 139, Princes Street, with 78 per cent. of marks; Third Prize (Richter's *Inorganic Chemistry*) to William Francis Martin, 21, Dale Street, with 76 per cent. of marks.

The prizes were then presented to the successful competitors by Mr. John Nesbit, Portobello, Chairman of the Board of Examiners for Scotland. Mr. Nesbit congratulated the prizemen on their success, and said the non-successful entrants might also be satisfied that though they had not got a prize, they had gained what was perhaps better: an amount of knowledge that would be of permanent value. He took occasion to refer to several of the former prizemen who had distinguished themselves, and now filled important appointments in various parts of the world.

On the motion of the President, a very hearty vote of thanks was awarded to Mr. Nesbit for his kindness in attending to present the prizes.

The President then proceeded to deliver the following address:—

INAUGURAL ADDRESS,

BY ALEXANDER SUTHERLAND.

At the beginning of a new session it is customary to note the errors and failures which have marred our course in the past, and to map out our road for the future. Consequently, about this time every year numerous guides appear, each with his plan of "getting on," and, were the "Pharmacist's Progress" written, it would be evident that there are as many bye-paths and enchanted grounds to be met with, as those described by the immortal dreamer of Bedford.

Now I am not going to play the guide in that way, but I would like you to note some of the relations of the pharmacist in his progress, and in the first place, to have a glance at the pharmacist himself. The basis of the personality of the pharmacist is character. How rarely do we find this inculcated on our younger men! On every side we hear—"attend our...

"go through our curriculum," "study my work," but rarely "first cultivate honesty, integrity, reverence, general uprightness of character." Now a knowledge of right and wrong does not constitute character. Character is formed by doing these things, and doing them habitually. The youthful aspirant to pharmacy usually has only the knowledge of right and wrong when he makes his first acquaintance with the ever-present pill-machine and the perennial seidlitz powder. His character will be formed by what, whether of good or evil, he is allowed or set to do: but more especially by what he sees done—in other words, by the result of the characters of those around him.

It is quite a common thing to hear the following remark: "Oh! I believe Mr. B. is a little wild outside, but I have nothing to do with that." Nothing? gentlemen, nothing? You know that Mr. B. has a painful habit of exaggerating outside, but of course you believe Mr. B. implicitly in business! Do you? The illustration might be extended. You who are seniors and employers should realise that when you have young men in your hands for more than two-thirds of their waking time, during the most impressionable part of their lives, for, say, an average period of six years, you possess the greatest influence on them, and that you exercise that influence for the best: for the formation of a reverent, upright manliness, which will make their acquired knowledge available in the highest degree for the safety and health of the public. Not realising this, you may be cursed by these young men both in their hearts and by their actions. I am afraid some of these actions are proving curses to you now.

You grumble because your assistant transferred his services to another firm for what you call a "paltry advance" of £10 per annum. You say you would not mind that, but, when leaving, your assistant told you he was leaving in order to study. Just so. Your assistant one day heard you explain to a customer the difference in the price of Liebig's Extract in your establishment and the price in the grocer's round the corner by the slight suggestion that yours was genuine.

Again, we hear you grumble at the young men who make "stores" possible. You have, to a large extent, formed the character of those young men. Does it say much for the influences exercised, when young men trained by you in habits of thought to a large extent as well as of work go to serve those to whom you are inimical and who are inimical to you? Young men do not always go to stores because they are unfit for any other place, or because no other place would take them or was open to them. They and we have worked at the same counter and been lectured and instructed by the same "boss." They and we have seen the said "boss" agze out of the door to see if Mr. Over-the-way was closing before there was any signs of our shutters being put up, the while he spoke of the hard-worked and late-worked pharmacist and the excellence of the early closing movement (for other people). They and we have known the same "boss" drop the price of sundries all round on the authority of some "traveller's tale"—"town-traveller's" tale, I should say—about some place where sweeping reductions, in some things, were being made, and have

suffered for it in low salaries, due, according to the "boss" to the general depression in trade. They and we are older now. They have gone to the "stores" for, in many cases, as good salaries, and in the majority of cases shorter and more fixed hours, and, feeling comfortable, they speak of our cant and hypocrisy, and knowing our ways they challenge us to throw stones at them, and we dare not.

We cry with an exceeding bitter cry for an ethical code embodying an upright, gentlemanly treatment of one another. If we wish ever to see it realised, we had better begin to realise it in ourselves, so that we may be able to form it as a portion of the characters of those in contact with us.

Now, from these remarks I think you will gather my first point, that the formation of an honourable character is the laying of the foundation on which should be built the pharmacist's life, and that this character, if formed, would simplify the burning questions of the day. The application of course is, that you begin and cultivate your characters and the characters of those in contact with you.

Along with the development of character comes education and the acquirement of knowledge. The appointed tests of education are examinations. These should be satisfactory tests of things essentially needful. The present tendency, I think, is rather to overdo the number of things supposed to be needful, as witness the tendency to improve on the "Preliminary." Take the language question, for example. As auxiliaries one might learn Greek, on account of its place in scientific nomenclature, and not only French and German for scientific literature, but Russian, Danish and Italian, to go no further.

The examinations are for the pharmacist, and not merely for the chemical specialist or bibliographer, and when a lad knows his arithmetic well, his own language thoroughly, and can translate with facility from and into the one language with which he comes in contact, I do not see that his burdens should be added to.

After the "Preliminary" comes the special pharmaceutical education. Now we hear a great deal regarding the necessity for a curriculum, and I doubt not but that it would do a great deal of good, but even already it is, to a large extent, merely a cloak to cover the sins of an inefficient apprenticeship. An apprentice learns to manipulate a pill-machine, to make a mixture in a fair way, and other pharmaceutical processes. Has he not as much right to learn how to test the drugs passing through his hands, and to have their properties, chemical or otherwise, explained to him? A curriculum will be useful, in fact is almost requisite for the codification of his knowledge, but not as a substitute for the training he ought to have in the shop. To recapitulate: the pharmacist must be a man of character, with a thorough knowledge of things necessary and essential, and be adding steadily to his store of auxiliary knowledge. So much for the pharmacist himself.

Now let us consider the pharmacist's relations to his fellow-craftsmen. These, we all regret, are not of the best. "Why are we so jealous of each other, and why

do we stand aloof from one another so?" I am afraid that is a conundrum we must all give up! The ready ear for any scandal affecting another, the disposition to be little one another disgraces us. We are certainly greatly characterised by "the faithless coldness of the times." In the Confucian "Analects" a favourite antithesis is that between the princely man and the small man. In many of our acts of social intercourse we are, I am afraid, rather of the nature of the small man. We must cultivate the character of the princely man, with nothing mean and small about us. Take, as an instance of the small spirit, the attitude of many men towards the Pharmaceutical Society. It puts one in mind of the description of the "mixed multitude" who inhabited part of Palestine at one time, and of whom it is recorded that they feared the Lord and served their own gods, for these men fear the Pharmaceutical Society, but serve local federations or any other society interest. We must learn to be loyal to our own Society first, and influence those around us to be the same.

But the pharmacist has a wider relationship yet—his relation to the State as a citizen and as a pharmacist. As a pharmacist he does the State good service whether he be master or servant in the pharmacy, but he also has a social relation to the State, and if by long hours—which cause enfeeblement of body, curtail reasonable relaxation, or render social duties and ties impossible—he damages either himself or others in their relation to the State as citizens, he is a criminal, constitutes a public danger, and justifies State interference.

Now, what I am about to say further to you will probably make you smile, but do not laugh too much; beneath the humour there is a very serious vein, which it will be worth your while to look into. As an assistant the pharmacist is a wage-earner, and it is a maxim that the minimum wages of a respectable citizen should be sufficient to enable him to live and reproduce his kind in comfort. The science of the State informs you that your physical manhood reaches its fullest development towards the age of 25, but how few of you at the age of 25 receive enough to keep yourselves in comfort, let alone a wife and family; so you toil on for about ten years more, and then, finding you have at last got a pharmacy of your own, you, old and cranky, with the joyousness of youth all gone, "settle down."

I place our wages system at the bar of our opinion, and in the name of struggling juniors who can hardly keep body and soul together, of seniors who have to toil for ten to fifteen years to save sufficient to buy a fifth-rate pharmacy. Yes, and in the name of pharmacists who are employers, and who suffer through the multiplication of pharmacies, I condemn it as bad. Many an assistant opens a pharmacy of his own because he was too poorly paid as an assistant, and because there was no chance of his settling down in life, so that the short-sighted employer suffers from the results of his short-sightedness. I would like to see it reckoned just as honourable for a man to remain as an assistant, and fulfil his duties as a citizen in that capacity on a sufficient salary, as it is for him to wait

before he settles down until he opens a pharmacy of his own—only, in many cases, to increase the general misery.

I have now indicated some of the stumbling blocks in the pharmacist's progress. Your own good sense will point out the course to pursue. If you cultivate an honourable character, a sound knowledge of things necessary and essential, combined with an ever-growing and ever-widening knowledge of auxiliary things, not forgetting the words of the poet:

"Let knowledge grow from more to more,

But more of reverence in us dwell,"

if you have this reverence for your fellow-craftsmen, and serve the individual in the State and the State in the individual, you will have approached nearly to that conception of our minds oft spoken of yet seldom seen—the ideal pharmacist.

Mr. J. M. Cameron, the Vice-President, in moving a vote of thanks to the President, said they were greatly indebted to him for the frankness and clearness with which he had spoken on important topics that well deserved serious consideration. Whatever might be thought of his suggestions, there would be but one opinion as to the laudable end he had in view. He had pointed out undoubted shortcomings, and indicated the remedial steps to be adopted for their removal.

Mr. Boa, President of the Edinburgh District Chemists' Trade Association, in seconding the vote of thanks, said he had listened with pleasure to the scholarly address which had just been delivered. It was eminently practical, and rather out of the usual line of such addresses. He agreed with much of what was said, though on some points he was not so clear. With regard to the testing of drugs, for instance, he was not without hope that such would in time be part of an apprentice's training, but they had to defer to custom, and this would only come about gradually. With regard to the relationship subsisting between members of the pharmaceutical craft, he was delighted to observe that during recent years there had been a very marked improvement. He could remember a time in Edinburgh when there was nothing like the "come and go" that now happily prevailed. He was in hopes that a kind of professional etiquette would soon be established. He did not mean an ethical code, but a good understanding and mutual respect that would preserve them from running one another down. With regard to shorter hours and adequate salaries, much consideration was required. What with cut prices and keen competition he did not think employers were in a position at present to pay a salary to assistants such as the President had indicated.

Mr. Nesbit said he concurred in the views expressed by Mr. Boa. He had frequently observed the assistants who most clamorously asked for shorter hours were themselves the greatest sinners when they started business for themselves. He did not agree in the view that the Preliminary examination should not be increased in stringency and scope. He also was of opinion that they should have a compulsory curriculum, for they could not teach an apprentice chemistry, botany, and materia medica. He must attend a school, and then he would pass his examinations with credit. He had to congratulate the Association on the very able address they had just listened to.

Mr. Lunan said he felt as if he were being arraigned and taken to task. They, as employers, began with good intentions, but soon found the struggle to make a profitable business predominate in their minds.

ions. The President had put his case well, and but suggesting invidious comparisons, he thought address was one of the most brilliant that they listened to in the history of the Association.

Mr. Coull said he would like to reaffirm the views the President, had expressed in favour of a higher standard in the "Preliminary," and a compulsory curriculum. On these points he was inclined to differ from the President, but he concurred most heartily in the address.

The President, in replying, said he did not oppose a call for an improved "Preliminary." What he said was it should contain certain essential knowledge and not what was only auxiliary. In regard to curriculum he was in favour of it, but it must not take the place of, or become a substitute for, a proper apprenticeship. He concluded by thanking the gentlemen who had kindly favoured them with their presence at the opening meeting, and expressed the hope that they would honour them with their presence during the session.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The usual fortnightly meeting was held on Thursday, the 15th inst., when Mr. John Foster, vice-president of the Association, occupied the chair, and introduced Professor King of Anderson College Medical School, who delivered a lecture on "The Early History of Botany." At the conclusion of the lecture, Mr. James moved a vote of thanks, which was seconded by Robert Brodie, and supported by the chairman, who referred to the pleasant botanical rambles he had enjoyed under Professor King's guidance. The motion was carried unanimously.

COUNCIL MEETING.

Forwards a council meeting was held, at which a communication to the president of the Association, Mr. M. Cartledge, president of the Pharmacopoeia Society, stating his desire to meet the Glasgow West of Scotland Association on Wednesday, December 28, was read and considered. It was decided to hold the meeting in the Christian Institute, 10, Buchanan Street, notice thereof to be sent to chemists and druggists throughout the West of Scotland, and every effort made to have a representative gathering. The secretary intimated that John McMillan had offered to present the Association with a framed portrait of Mr. Alexander Kinninmonth. The offer was accepted with acclamation, and the secretary instructed to convey the thanks of the Association to the donor in writing. The meeting arranged for the 29th inst. was postponed to the following Thursday, December 6.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE MEDICINE STAMP DUTY ACTS.

SALE OF MEDICINES UNSTAMPED.

On November 14, Mr. Bishop, chemist, of High Street, Kingsland, was summoned, before Mr. Lane at North London Police Court, at the instance of the local authorities, for selling a proprietary medicine unstamped. Mr. Hawkins prosecuted, and stated that Act 52 George III., cap. 150, sec. 2, laid it down that all patent and proprietary medicines which were by public advertisement must bear an inland revenue stamp. In this case the defendant sold a

preparation which he called "Aromatic iron and quinine tonic." On the labels on the bottle it was stated that the mixture was "prepared by S. Bishop, chemist, 129, High Street, Kingsland," and if the case ended there he (Mr. Hawkins) would not have suggested that the prosecution should have been undertaken. In his shop window, however, was a tablet, on which was printed "Bishop's Iron and Quinine Tonic." This Mr. Hawkins said implied that the tonic was a proprietary medicine, and consequently liable to stamp duty. The defendant said that the tablet complained of had been in the window for 16½ years. Twelve years ago witness had a similar label on the bottle, but being informed that he was liable to stamp duty for selling the medicine in this way he altered the label to the present form. He had not, however, removed the ticket from the window. Mr. Lane held that this ticket was an advertisement within the meaning of the Act, and it made the medicine liable to duty. It was, however, a technical offence, and if the defendant removed the objectionable ticket he should only fine him 5s., with 2s. costs. The defendant said the ticket was removed as soon as he received notice.—*Morning Advertiser.*

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

SALE OF DEFICIENT SEIDLITZ POWDERS.

At the Keighley Police Court on November 16, before Alderman B. S. Brigg and other magistrates, Fred Moore,* drug dealer, Haworth, was summoned, under the Food and Drugs Acts, for selling seidlitz powders which were not of the nature and substance and quality laid down in the British Pharmacopoeia. The defendant contended that he had not broken the law, because the inspector did not ask for seidlitz powders according to the British Pharmacopoeia. He asked for seidlitz powders, and he got them. The essential part of the powder was present, and the only deficiency, even according to the standard now set up, was in regard to the effervescing qualities. Alderman Brigg: Your powders would have less "fizz"? Is that the only effect? The Defendant: Yes. The authority on which the inspector takes his stand I have been unable to find until after these proceedings were commenced. I have searched my pharmacopoeia and could not find the formula, and I have now learned that it is in a supplementary work published about two years ago, of which I have had no notification. Alderman Brigg asked whether the label "genuine improved seidlitz powders" would not imply that there was a variation from the ordinary standard. The inspector said the drugs might have been better drugs; he believed they were, but the proper quantities were not there. Alderman Brigg: Would you hold, then, that there can be no seidlitz powders sold which vary from the official preparation? Mr. Randerson, the local inspector, replied that if attention was called to the variation, then all was well. If Mr. Moore had told him that the powders were not according to the British Pharmacopoeia then he would not have been summoned. Mr. Moore said it would be rather awkward if they had to ask all their customers if they required their drugs according to the B.P. Alderman Brigg: Yes, it would be very puzzling to your customers. Mr. Randerson: It would not be very difficult to notify the fact on the label. A fine of 1s. and costs was imposed. Mr. Randerson applied for special costs. Alderman Brigg: We think you might have been better employed than in running after seidlitz powders, and we shall not give you costs. Mr. Rander-

* This name does not appear on the Register of Chemists and Druggists for 1894.

son said seidlitz powders were often prescribed, and it was important that they should contain the proper ingredients and quantities. Alderman Brigg: That is a matter between you and your employers. We shall not give you costs. Mr. Randerson: You will allow the Court fees? Alderman Brigg: Nothing beyond that.—*Bradford Observer*.

POISONING CASES AND INQUESTS.

POISONING BY AMMONIA.

Emily Taylor, aged 20, died at Dewsbury on Sunday, November 11, after drinking liquid ammonia. Verdict: "Death was due to taking ammonia while temporarily insane."—*Bradford Observer*.

DEATH FROM OVERDOSE OF LAUDANUM.

Mrs. Thorne, aged 65, of Friars' Place, Moulsham, died on Sunday, November 4, from the effects of an overdose of laudanum, administered in a mixture containing treacle and vinegar. Verdict: "Death through inadvertence."—*Essex County Chronicle*.

CARBOLIC ACID POISONING.

Thomas Cowley, picture-frame maker, of Clare Street, Liverpool, died on Wednesday, November 14, from the effects of carbolic acid self-administered.—*Liverpool Mercury*.

SULPHURIC ACID POISONING.

Robert Whitworth, aged 47, died at Bowling Dyke on Saturday, November 3, after drinking sulphuric acid. Verdict: "Suicide whilst of unsound mind."—*Hatifax Mercury*.

POISONED BY A MORPHINE PILL.

Nancy Rigby, aged 14 months, died at Fleetwood on Saturday, November 10, after swallowing a quarter-grain morphine pill, of which she had in some way got hold. Verdict: "Death from misadventure."—*Fleetwood Express*.

POISONING BY STRYCHNINE.

Theresa Less, aged 25, of Brick Lane, Bethnal Green, died on Tuesday, November 13, from the effects of rat poison containing strychnine. Verdict: "Suicide whilst of unsound mind."—*Daily Telegraph*.

POISONING BY PRUSSIC ACID.

Lance-Sergt. Richard M. Eger, dispenser at the Royal Marine Infirmary, Stonehouse, died on Thursday, November 15, as the result of prussic acid poisoning. Verdict: "Death by misadventure through taking an overdose of prussic acid medicinally."—*Western Morning News*.

Books, etc., received.

THE PRACTICE OF PHARMACY. By JOSEPH P. REMINGTON, Ph.M., F.C.S. Third Edition. Pp. i.-xxviii., 1 to 1448, with over 600 illustrations. Cloth, \$6.00; sheep, \$6.50. Philadelphia and London: J. P. Lippincott Company. From the Publishers.

DEAF-MUTISM. By HENRY W. HUBBARD. Reprinted from the "Leisure Hour." Pp. 12. 6d. From the Author.

PROCEEDINGS OF THE KANSAS PHARMACEUTICAL ASSOCIATION AT SALINA, KAN., U.S.A. Fifteenth Annual Session. Pp. 132. From the Secretary.

PROCEEDINGS OF THE VIRGINIA PHARMACEUTICAL ASSOCIATION AT BLUE RIDGE SPRINGS, PA., U.S.A. Thirtieth Annual Meeting. Pp. 78. From the Secretary.

THE NATURAL HISTORY OF PLANTS. By KERNER and OLIVER. Part 7. 2s. 6d. nett. London: Blackie and Son. From the Publishers.

Reviews and Notices of Books.

THE PHARMACOPOEIA OF THE LONDON HOSPITAL. Compiled under the direction of a Committee appointed by the London Hospital Medical Council. Pp. 262. London: S. F. Hodson.

In the latest edition, recently published, of this Pharmacopoeia there is a "Materia Medica," together with a collection of formulae, an appendix comprising instructions for case-taking, directions for the examination of urine, a table of doses, etc. The *raison d'être* of the "Materia Medica" is not at all obvious. There is a note at the beginning, to the following effect:—"All the drugs of the B.P. of course, kept in stock; they have been culled from this Materia Medica, except where preparations of them are made special to the London Hospital." Also the Posological Table at the end of the Pharmacopoeia. The descriptions of the articles mentioned are too meagre to be of any use, and the convenience of having an account of the most important drugs, those the compilers deem so—in a handy form, therefore, without advantage. Among the names, over fifty have names identical with those of preparations occurring in the British Pharmacopoeia, but are of different composition. The object of this ought to be apparent to anyone with medical or pharmaceutical knowledge, and cannot be too heavily censured. Hypodermic injections of morphine, liniment of opium, and pill of laudanum, for example, differ in strength from those ordered in the British Pharmacopoeia. Many others are preparations of considerable importance, and the compilers of the London Hospital Pharmacopoeia must be held responsible for a process calculated to destroy that uniformity of standards and other properties which the publication of the British Pharmacopoeia was intended to provide throughout the United Kingdom. If the compilers of the London Hospital Pharmacopoeia disappear, any of the official remedies, the onus rests with them to devise names for their alternative formulae, which shall prevent the confusion likely to result from having preparations synonymous with those of the B.P., but of different composition.

There are no less than 124 formulae, 68 for pills, and 53 for ointments. It may be safely said specified in this Pharmacopoeia that the prescriber will not remember and the student will not trouble to learn the composition of so many formulae; and the dispenser cannot, to his advantage, have ready prepared such a variety of stock remedies, many of which contain such dangerous substances as hydrocyanic acid, foxglove, and perchloride of mercury, and will not keep good more than a few months. The nomenclature employed in the descriptions of chemical substances is very mixed. Some of the potassium salts are sometimes described as salts of potassium, and salts of calcium as salts of lime. On page 12, acidum phosphoricum fortius is said to contain 50 per cent. of anhydrous phosphoric acid.

* See Preface to British Pharmacopoeia, 1867 and

Correspondence.

THE METRIC SYSTEM AND THE FIRST EXAMINATION.

Sir,—It is not desirable that one who exercises the judicial functions of an examiner should often invade the domain of pharmaceutical politics, and it is my practice, in common with that of my colleagues, to avoid the arena which the strife of tongue and pen may at times render unseemly. But occasionally a question arises where word from an "insider" may cause our fellow-members to hesitate before passing a hasty judgment upon the doings of the Boards of Examiners. I do not wish to criticise the Lancashire address of Mr. Rymer Young. For its purpose it could not easily be improved upon. Gracefully written, the opinions expressed are always calm and judicious in tone. In dealing even with matters of considerable controversy, Mr. Young never fails to maintain the dignified language expected from a leader of English pharmacy. With the subject matter of a large portion of his address I feel myself in genuine sympathy. At the same time I feel that such is not the case with regard to his remarks on the "Metric System." Mr. Young observes: "I should like to remind you that Mr. Artindale considers the Board ought not to be content with a merely theoretical knowledge of the metrical system of weights and measures, but that candidates should be required to show practical familiarity with their use." A resolution to this effect was passed by the Council, but rejected by the Board. The inference to be drawn from this, and from his further observations, is that the Board does not require a practical, but merely a theoretical knowledge of the metric system. As a matter of fact, such is not the case. Every candidate under the present schedule is, and has been, expected to show practical familiarity with that system. During both the Minor and Major examinations in Practical Chemistry, that system of weights and measures is made use of in determining specific gravities, and making volumetric and gravimetric analyses. It is, indeed, the practice of the Board to reject candidates who possess only a theoretical knowledge of the subject. Doubtless Mr. Young was unacquainted with the fact, and it seems, therefore, the more necessary to draw attention to it. What the Boards decided not to do was to introduce the system into the examination in Practical Pharmacy. In the first place it is manifestly useless to duplicate any part of the examinations. Nor does it seem to me desirable to needlessly befog the candidate with a subject so notoriously trying as dispensing. We have no aim at making that part of the examination a test chiefly of manipulative ability, deferring calculations as far as possible to the subsequent examination in Theoretical Pharmacy. Physicians, again, at least in this country, do not write prescriptions in the metric system, and in the present state of pharmaceutical education, it would be absurd to hand candidates the polyglot scrawls of continental prescribers. Possibly in the future the effect of foreign prescriptions might be introduced with advantage into the Minor, but it is manifestly unfit for the Minor syllabus. The point remains, however, that candidates are actually examined practically in the metric system, and if unable to make use of that system are rejected.

With Mr. Young's remarks on what may be termed ante-pharmaceutical training of the pharmacist I cordially agree. Your readers are aware how much I deplore the narrowness of the present First examination, how much I desire to see it broadened, or, better still, removed off the face of the earth. When half a century ago we found it necessary as a Society to see that candidates could read, write, and count, we were only to do so by examining them ourselves, or by getting local clergyman or schoolmaster to put a few questions to boys. To-day, keeping pace with the marvellous advance of elementary education, we have universities and other scholastic institutions of standing providing us with thorough examination in all branches of elementary knowledge at a trifling cost. The *raison d'être* of the Preliminary has ceased to exist, and the examination itself should as soon as possible be done away with. Minor and Major examinations are relatively far more difficult than the Preliminary, and the consequence is that those who are admitted into pharmacy who have little or no

expectation of ever qualifying. They have had a quite inadequate elementary training, and it seems impossible to graft a sound, scientific education on so feeble a stock. We should remember that the Preliminary ultimately determines the status of the whole body. Pharmacy can never expect to hold up its head amongst the liberal professions until it draws its recruits from a better educated class. We do not want the feeble folk who are not up to the standard of the other professional Preliminaries. Cannot Mr. Young and his able fellow-councillors put their shoulders to the wheel?

143, New Bond Street, W.

J. E. SAUL.

HOSPITAL PHARMACOPŒIAS AND PRESCRIBING.

Sir,—Your editorial *re* the art of prescribing in last week's issue of the Journal, attributing to some extent the decline of that art to the existence of hospital pharmacopœias, calls for some little notice in defence of their use, for without them it would be a matter of impossibility to carry on the work of a large hospital dispensary, however numerous the staff might be. But allow me as "one who knows" to say that their use is more often honoured in the breach than in the observance. I grant that there are of necessity a number of stock preparations, but these in a multitude of cases only represent a basis or vehicle for administering more potent remedies. In a large establishment there is no such thing as uniformity of dosage, the range of each man's views in regard to posology being very different, and so a slavish adherence to a set of formulæ is not thought of nowadays, when a stock of 500 things or more comes into use. Your remarks with regard to hospital prescribing would years ago have been quite justified, but my experience—and it extends over many, many years—is that now there is a great deal more of independent (if I may use the word) prescribing than formerly. It is no uncommon thing to have a prescription with five, six, or seven different ingredients in varying doses; in such cases it is well-nigh impossible to keep a ready-made preparation for dispensing; and if by chance you do manage to combine a formula, the very next day, out of sheer "cussedness" perhaps, the dose will be altered and your pains thrown away. So much for the hospital pharmacopœia; it may be an evil, but it is a necessary one as the case stands. With regard to the art of prescribing, I do not think it is in the out-patients' room that students are expected to, or do, get their insight into that art, but rather at the bedside or clinical instruction. And here the prescriber is not limited to such an extent as he must necessarily be for convenience sake in the O.P. room. Any one acquainted with in-door hospital practice at the present day will bear me out when I say that no half-dozen prescriptions are similar in all respects. I suppose there is hardly a medical man who has not his stereotyped formulæ, and however wide his knowledge of *materia medica* may be, he will adhere to his favourite remedies, and so reproduce in his own practice a pharmacopœia *sui generis*. We are all apt to follow a certain groove, whether of thought or action, and so, in the case of hospitals where there is a large staff, there is plenty of variety in the dispensary. It may be beside the question, but I think a good many will agree with me that if we had fifty per cent. less items to deal with in our pharmacies and dispensaries, suffering humanity would be none the worse off; and I cannot better end this long letter than by quoting the words of a well-read and practical man, who once said to me: "Use the old remedies well and judiciously, and you will have no need to puzzle your brains to find new ones."

WILLIAM HARVEY,

Dispenser City of London Hospital
for Diseases of the Chest, and Divisional
Secretary for N.E. Bethnal
Green.

A CORRECTION.

Sir,—I beg to call your attention to an error in last week's Journal, page 410, where you mention Mr. Brooks as having taken part in the discussion on Mr. Young's paper. My name ought to have been inserted there; the mistake may have arisen from the fact that I am in business with Mr. Brooks. Will you kindly rectify in the Journal for the current week.

Waste.

JAMES PENDLEBURY.

CHEMISTS AND COMPANIES.

Sir,—I think the question of unqualified company trading ought to be discussed in the Journal, with the object of coming to some understanding as to the future position of the chemist. It seems, as the law now stands, that there are two parties who are allowed to carry on business and to style themselves chemists and druggists; viz., the individual on the one hand who must pass the examinations of the Pharmaceutical Society, and on the other hand the company of seven individuals, not one of whom need be a qualified chemist. Owing to the keen competition introduced by these companies, the business of the chemist is becoming more and more unprofitable, and men will not care to enter the ranks of chemists and druggists unless they can see a prospect of fair reward for their labour. It may be that there are too many chemists already for the needs of the population, and that some elimination is necessary; but if so, should not the competition which is to bring it about be upon fair lines? Qualified man against qualified man, not against a company of unqualified capitalists. Complaint is made that so many chemists do not support the Pharmaceutical Society. How can that be expected if the Society cannot protect the interests of its examinees? To some extent the Society is doing good work in prosecuting unqualified individual traders, but the most important work remains to be done. The inability of the Society to stop the carrying on of chemists' businesses by unqualified companies is much to be deplored. The company traders are now competing with individual chemists all over the country, and it may be that there will be few, if any, qualified men in the future able to get a living except by seeking company employment. It is to be hoped that the Law and Parliamentary Committee of the Council will give this matter its most earnest consideration, and take prompt action. One need hardly say that in the prosperity of its members lies the welfare of the Pharmaceutical Society.

PHARMACEUTICAL CHEMIST.

MEETING AT MANCHESTER.

Sir,—In what I believe to be otherwise an excellent report of our Manchester meeting last week I am made to say (folio 410, line 31) that "the Society could be doing no more for the trade to-day than it was doing when those gentlemen left." As this is so opposite to what I did say and believe, will you kindly allow me to correct it. My answer to the gentlemen referred to was that the Society could not be accused of doing nothing for the trade to-day whatever may have been the case when they severed their connection with it. It may be interesting to you and your readers to know, as it is a pleasure to me to record, that both of these old friends have consented to join again. I notice you describe me as "Secretary." This should be "local secretary," and in justice to my friend Mr. Blackburn, who fulfils the duties of that office in connection with our Association, I must disclaim the honour.

Manchester.

HARRY KEMP.

MANDALL'S PATENT (6178, of 1893).

Sir,—In the report in your issue of 3rd inst. of the proceedings for revocation of this patent you twice refer to the medicine in question as "licoricine." The article in question is not so described either in the specification or patent, and as a matter of fact is different to that which has hitherto been sold by Mr. Mandall under the name of "licoricine." We shall be obliged by your making this correction, which is of importance to our client.

London.

NEVE AND BRCK,
Solicitors for Mr. Mandall.

SMART DISPENSING.

Sir,—I received enclosed this morning from an A.P.S. and hope that it may stimulate by its smartness some of the younger fry among us.

PRATER.

[Enclosure.]

"On coming home from church this morning, I found a prescription waiting for a M. and Pu. xx. The M. had in it *Zvi. tr. ferri muratis, Ph. Edin.*, and the powders were gr. vi. of pulv. sabinae. The afternoon was spent in making the tinct., and in hunting for the savin in nursery gardens, etc. I found the latter, dried it, made the pulv. into some cachets, sent them off, and went to church again at 6.3."

Obituary.

Notice has been received of the death of the following:—

On November 1, George C. Guest, Chemist and Druggist, Alsager.

On November 3, Charles Gray, Pharmaceutical Chemist, Bilston. (Aged 76.) Mr. Gray had been a member of the Pharmaceutical Society since 1853.

On November 5, Charles Matthews, Chemist and Druggist, Ashby-de-la-Zouch. (Aged 81.)

On November 7, Alfred J. Sharp, Chemist and Druggist, Spalding. (Aged 48.)

On November 8, John Jones, Chemist and Druggist, Llanrwst. (Aged 81.)

On November 10, M. H. Hutchinson, Chemist and Druggist, Edinburgh. (Aged 51.)

On November 11, John W. Bamford, Chemist and Druggist, Rochdale. (Aged 60.)

Diary of the Week.

MONDAY, NOVEMBER 26.

Imperial Institute.

House Dinner, at 6.45 p.m.

"More Curiosities of Bird Life" (illustrated by coloured lantern slides), by R. Bowdler Sharp, at 8.30 p.m.

TUESDAY, NOVEMBER 27.

Royal Photographic Society, at 8 p.m.

"Demonstrations on New Apparatus," by A. Pringle.

Adjourned Discussion on Mr. Warnerke's paper.

WEDNESDAY, NOVEMBER 28.

Imperial Institute, at 8.30 p.m.

Ladies' Concert.

Society of Arts, at 8 p.m.

"Experiments in Aeronautics," by Hiram Maxim.

Glasgow Pharmaceutical Association.

Address by the President of the Pharmaceutical Society.

THURSDAY, NOVEMBER 29.

Pharmaceutical Society (North British Branch),

Meeting of the Executive at 12 noon.

Dinner of Scottish Pharmacists.

At the Royal Hotel, at 6.30 p.m.

Imperial Institute, at 4.30 p.m.

"The Utilisation of the Agave as a Fibre-producing Plant," by A. Vandendriesche.

School of Pharmacy Students' Association, at 7 p.m.

"History of the word—Chemistry," by C. S. Ellis.

"Sugar," by S. Davis.

Chemists' Assistants' Association, at 8.30 p.m.

Short papers by Members.

Liverpool Pharmaceutical Students' Association, at 8.30 p.m.

"Connecting Links between Herbalism and Pharmacy," by W. A. Cockshott.

"River Plants of Liverpool District," by G. V. Last.

FRIDAY, NOVEMBER 30.

Pharmaceutical Society of Great Britain.

Opening of the New Hall and Laboratories at Edinburgh.

Conversazione at 36, York Place, Edinburgh, at 8 p.m.

Sheffield Microscopical Society, at 8.30 p.m.

Practical Demonstration, conducted by Members.

SATURDAY, DECEMBER 1.

Pharmaceutical Football Club v. St. Michael's, at Wobolt Farm, Shepherd's Bush, at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Mr. Austen, Bennett, Clague, Clark, Clarke, Clegg, Co. Dott, Duncan, Evans, Harvey, Hill, Laing, Lucas, McKellar, Morley, Morrison, Pendlebury, Perry, R. Squire, Symes, Tallis, Tanner, Tickle.

"THE MONTH."

Bismuth Pyrogallate.

Although pyrogallic acid is a powerful poison the bismuth salt does not appear to be so toxic. It is, therefore, been introduced as a disinfectant. Oswinkel prepares it by dissolving 150 parts of pyrogallic acid in 650 parts of a 25 per cent. diam chloride solution, and adding this solution 316 parts of bismuth trichloride dissolved in 100 parts of a salt solution of the same strength. After digesting on the water-bath for half an hour a solution is poured into water, and the bismuth salt thus precipitated is washed with water acidulated with nitric acid until the washings are free from chloride. The salt has the formula $H_2(OH) \cdot O_2 \cdot Bi \cdot OH$. Vincenzi Vittorio obtains a similar salt by triturating pyrogallic acid with twice its weight of bismuth carbonate and water, and then heating the mixture on the water-bath till carbonic acid ceases to be evolved. The product changes from white to yellow and is finally washed with water. Vittorio speaks highly of its value as an internal antiseptic (*Apotheker Zeitung*, ix., 687).

Preparation of Phosphine.

The old method of preparing phosphine, by treating phosphorus with caustic potash, is open to many objections, and Retgers claims to have discovered a simpler and more instructive method. This is based on the fact that phosphorus combines, under suitable conditions, with free hydrogen. The hydrogen is gently passed over phosphorus heated in a glass tube, the liquid solid hydrides are condensed in a wash-bottle, phosphine gas free from hydrogen escapes (*anorg. Chim.*, vii., 264).

The difficulties presenting themselves in the preparation of pure water are well shown by the experiments of Herrn Krausch and Heydweiler, described in *Wiedemann's Annalen*. They noticed a surprising difference between the electric conductivity of water distilled in air and in vacuo, the former being about fifteen times the conductivity of the latter. Even when water was distilled in vacuo its conductivity was still influenced by the solvent action exerted on the glass containing vessel, but it was to a great extent overcome by the use of a glass vessel in which water had been constantly boiled for ten years, so that the bulk of the more soluble constituents had probably been removed. The conductivity varied largely with alterations of temperature, being over ten times as much at 50° C. as at 0° C., and it was found that there was a temporary increase of conductivity when the current passed for any considerable time; an increase which sometimes amounted to 100 per cent., and not yet been explained. The conductivity of pure water was only about 1/40,000,000,000,000 of that of pure copper! The amount of residual impurity in the water distilled in vacuo was estimated at only a "few" thousandths of a milligramme per litre, i.e., only one ten-thousandth as much as the weight of the air absorbed on exposure to the atmosphere. This small amount of impurity, however, still enough to increase the conductivity to an extent which is estimated at about 1 per cent.

Aluminium Boroformate.

J. Martenson describes this substance as possessing good though mild antiseptic and astringent properties. It has recently been successfully used in the Oldenburg Children's Hospital at St. Petersburg, and is obtained by saturating a solution of two parts formic acid and one part of boric acid in six or seven parts of water, with freshly precipitated and well washed alumina. The solution may be used direct, or may be concentrated until the salt crystallises out in large scales of pearly lustre. The crystals dissolve slowly but completely in water or dilute alcohol, and the solution has an acid reaction and a sweet, astringent taste. The alumina cannot be separated from the compound by the ordinary precipitants.

Oxidation of Alcohols.

F. Gaud gives the results of experiments in which different alcohols were oxidised by Fehling's solution. In the case of ethylic alcohol a mixture of equal parts of the fluids was decolorised in about an hour, a crystalline precipitate formed, and the liquid was found to contain unaltered alcohol, aldehyde, and acetic acid under the form of potassium acetate. The reaction is similar with methylic alcohol, formic aldehyde and potassium formate being formed; whilst propylic alcohol yielded propionic aldehyde and potassium propionate. In a second series of experiments an excess of Fehling's solution and elevation of temperature modified the results, cupric acetate being formed with ethylic alcohol, and decomposing into cuprous oxide and carbonic and acetic acids. Or, when the reaction was checked for about six hours, acetate of potassium was found with that of copper. In the case of methylic alcohol copper formate was produced, but afterwards decomposed, carbonic and formic acids being liberated; and from propylic alcohol a small quantity of what was probably one of the isomeric forms of lactic acid was formed. The precipitated cuprous oxide always occurred as very brilliant, reddish-violet, and octahedral cubes, and the metallic copper as microscopic crystals in the form of prisms terminated by quadrangular pyramids (*Comp. rend.*, cxix., 862).

Cases from Charcoal.

M. Desmond finds the composition of the gaseous mixture given off by wood charcoal distilled at a dull red heat to be as follows:—carbon dioxide, 9.14 per cent.; oxygen, 0.26; carbon monoxide, 18.08; hydrogen, 49.11; marsh gas, 16.04; nitrogen, 7.37. After the operation the charcoal possesses its ordinary appearance, and burns freely without smoke or odour. The source of the gases, it is suggested, may possibly be a solid or liquid organic body condensed in the charcoal (*Comp. rend.*, cxix., 733).

Nitrates of Mercury.

R. Varet, continuing his work on the relation between chemical and physical factors, has determined the heat of formation of the nitrates of mercury, and finds that, as in the case of the sulphate (*ante* p. 353), the reaction by which neutral mercuric nitrate, $Hg_2NO_3 \cdot \frac{1}{2}H_2O$, is decomposed by water is the least endothermic. He states also that nitric acid, like sulphuric, picric, acetic, and oxalic acids, when combined with oxide of mercury, is completely displaced by hydrochloric or hydrocyanic acid (*Comp. rend.*, cxix., 797).

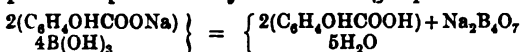
Thiosapol. A method of preparing sulphuretted soap has been made the subject of a patent by Rudel, of Berlin. It consists in heating unsaturated fats or fat acids, such as olein or oleic acid, with sulphur to a temperature of 120° to 160°C. Sulphur then enters into combination, and when oleic acid is operated upon the product contains about 10 per cent. of sulphur.



The sulphuretted product dissolves in ether or turpentine without separation of sulphur, and when saponified by a molecular proportion of caustic alkali, the soap dissolves completely in water or alcohol. Soap containing sulphur in this state of combination has been found very serviceable in the treatment of skin diseases by Drs. Eachhoff and Hager (*Apotheker Zeitung*, 1894, p. 858).

Scopoleines. The formation of acidyl derivatives of scopoline cannot be effected, according to Luboldt, by heating the salts of scopoline with hydrochloric acid, but by heating scopoline with salicylid he succeeded in obtaining salicyl scopoleine, $\text{C}_{16}\text{H}_{17}\text{NO}_4$. It is a colourless crystalline substance, soluble in alcohol or chloroform, melting at 105° C., and destitute of mydriatic action. Benzoyl-scopoleine was obtained by Hesse in 1892 by the action of benzoyl chloride upon scopoline. E. Schmidt has prepared acetyl scopoleine by the reaction of scopoline with acetyl chloride or acetic anhydride, as a readily soluble crystalline substance melting at 52° C. (*Apotheker Zeitung*, 1894, p. 869).

Borsalicylate. As a non-poisonous antiseptic preparation that is soluble in water, Bernegau recommends a mixture of two molecular proportions of sodium salicylate with four of boric acid. The finely powdered ingredients intimately mixed with addition of water yield a hard mass which is dried and powdered. The reaction taking place is represented by the following equation:—



The temperature at which water possesses its maximum density has recently been re-determined by M. Coppet, who finds it to be 3°·982 C. at the normal atmospheric pressure. In carrying out his experiments, he immersed a vessel of water containing a number of thermometers whose bulbs were arranged at different heights in an outer vessel of cold water. The convection currents set up as the water cooled commenced by passing down the sides of the vessel and up the middle, but after a while they ceased and then became reversed. As the heaviest water sinks to the bottom of the vessel, the temperature registered by the lowest thermometer was taken as that of maximum density (*Ann. chim. phys.*, [7], iii., 246-268).

Vaporisation of Carbon. H. Moissan finds, as the result of extended experiments, that the vapour of carbon invariably condenses in the form of graphite.

In the case of incandescent electric lamps a trace of silica or of a calcium salt on the carbon filament may combine with the carbon to form carbon silicide (see *Pharm. Journ.*, [3], xxiv., 341) or calcium carbide, and a microscopical examination of the deposit formed on the glass in such lamps revealed the presence of minute crystals of

the former compound amongst the graphite which constituted the larger proportion of the deposit. Like arsenic, carbon appears to pass from the solid to the gaseous form without passing through the intermediate liquid state. It is not unlikely, however, that carbon may be liquefied, but this phenomenon will require the application of more or less pressure. Great pressure results in an augmentation of the density of the carbon, and the diamond can thus be produced, but the application of the right degree of pressure may bring the element to the liquid state, and the fluid may then solidify like water, either presenting a confused mass of crystals or rounded and amorphous masses like those diamonds occasionally found at the Cape or in Brazil, which possess no apparent trace of crystallisation (*Comp. rend.*, cxix., 776).

Salactol. A preparation consisting of the sodium salts of salicylic and lactic acids has been introduced under this name, and when dissolved in a 1 per cent. solution of hydrogen peroxide it is recommended as an efficient remedy for diphtheria. According to the results obtained in its use for that purpose by Dr. Walf and other physicians it is stated to be very much more effectual than the anti-diphtheric serum of Behring. The solution is applied to the throat with a brush every four hours, and in the intervals the solution is used as a gargle. It is also stated to act as a prophylactic. Application has been made for a patent for the preparation of salactol, and its manufacture is being carried out at the factory of Karl Fr. Töllner in Bremen.

New Medicinal Agents. The following articles of recent introduction are described in the

Pharm. Centralhalle:—**ANTITETRAIZINE** is a derivative of quinine which has been employed by Zambelletti in the treatment of influenza, rheumatic and neuralgic affections, etc., in doses of from 3 to 6 grains (12 to 23 grains in the twenty-four hours). **BISMUTH SULPHITE**, used by Cesaris and Raccach as an antiseptic in the treatment of fermentive disorders of the stomach and intestines, and in dislodging worms (*Boll. chim. farm.*). **CADMIUM SALICYLATE**, used by P. Cesaris in the treatment of suppurating inflammation of the eyes (*Boll. chim. farm.*). **CALCIUM BORATE**, used by Alberti in the treatment of eczema, burns, offensive perspiration and internally for infantile diarrhoea, in doses from 4 to 6 grains (*Orosi*). **CHLOROIODOLIPOL**—chlorinated derivative of phenol creasote and guaiacol, used by Zambelletti as an inhalant in chronic affections of the respiratory organs. **EXTRACT OF HEMP**.—This is a dietetic preparation introduced by T. Barthelson, of Hjerper, for the use of consumptive patients, etc. According to an analysis by Dr. L. Spiegel it consists of:—

Starch	510
Albuminous substances	295
Fat (hemp oil)	80
Ash	10
Water	105

The preparation is sold by H. Schutte and Co. Berlin. **SALIFEBRIN**, or **SALICYLANILIDE**, is a white powder probably consisting of a mixture of acetylide and salicylic acid, insoluble in water, but soluble in alcohol. **SUBLIMOPHENOL**: colourless crystals, consisting of a mixture of mercuric chloride and phenolate, prepared, according to Desesquelle, by mixing molecular proportions

caesium phenolate and mercuric chloride. The ddish precipitate first formed becomes yellow and en white. After washing it is crystallised from cohool. The crystals melt at 210°C. with decom- mition (*Pharm. Zeit.*). UNGUENTUM VEGETABILE is a ointment basis introduced by Koch and Becker nsisting of an emulsion of vegetable wax, oil, rax, and water. It is recommended on account its durability, antiseptic action, and capacity of king up water.

It is reported that Professor Remedy for Diphtheria. LÖFFLER, of Greifswald, the dis- coverer of the diphtheria bacillus, has suggested a new remedy for the eases. The mixture recommended is said to nsist of alcohol, 60 per cent.; toluol, 36; and sution of ferric chloride, 4. Menthol is added, eaden the pain caused by the application, hich is effected by means of pieces of wadding, e affected parts being at first treated every three : four hours. Of seventy-one patients treated by is method from the outset, all have been saved, hile only one death occurred out of twenty-six ees treated after the second day of the attack.

Hesse has isolated from pereira Alkaloids bark (*Geissospermum vellosii*, Apo- of cynaceæ) a crystalline alkaloid Pereira Bark. called "geissospermine," $C_{19}H_{34}NO_2$, ut a drug sold under this name is described y Freund and Fauvet as consisting of a ifferent alkaloid, "vellosine," $C_{23}H_{38}N_2O_4$, his, heated with dilute haloid acid, yields apovelloisine," $C_{16}H_{25}N_2O_2$, but with strong ydrobromic acid, it yields "apovellozol," $C_{14}H_{21}N_2O_2$. This, in turn, treated with caustic ash, yields "apovelloidine," $C_{15}H_{24}N_2O_2$. The ysiological action of vellosine is in general milar to that of brucine, 0.05 Gm proving fatal a frog (*Annalen*, 282, p. 247).

E. Bourquelot discusses the pre- sence of methyl-salicylic ether in the sources of plants and shows that those in which it has at different times been discov- ed—*Gaultheria procumbens* (leaves), *G. leschenaultii*, *punctata*, *G. leucocarpa*, *Betula lenta* (bark), *Poly- a senega* (root), and *P. alba* (!)—are all exotics. He found it, however, in indigenous species of *Poly- a* and *Monotropa*. The fresh root of *P. vulgaris*, when crushed between the fingers, is said to give a distinct odour of the ether, and salicylic acid readily detected. The roots of *P. depressa*, underoth, and *P. calcarea*, F. Schultz, also con- n the compound, as well as the stem of *Monop- a hypopitys*. The latter yields the odour tantly when crushed, and may contain the er in a state of combination from which, as in case of analogous principles, it is released under influence of a soluble ferment. Procter, when mining the bark of *Betula lenta*, was able to separate mpound (gaultherin) which yielded methyl-salicy- ether on hydration, but attempts to find a similar pound in *Monotropa hypopitys* have so far proved ls. Bourquelot has proved, however, that frag- ts of the stem of that plant and of the root of *gala* sp. possess the property of decomposing alalin when they are added to an aqueous on of the glucoside, and this would seem to e the presence of a ferment analogous to in (*Comp. rend.*, cxix., 802).

Ascent of Sap. Dixon and Joly, in a paper recently read before the Royal Society, pointed out that Strasburger's experiments on the ascent of sap have eliminated the direct action of living protoplasm from the problem, and that the explanation thus remained to be sought in the tracheal tissue and the transpiration activity of the leaf. The ascent would appear to be principally in the lumen and not in the wall, and the stable condition of the ascending sap probably accounts for the transmission of the tensile strain without rupture of the column of liquid. The transmission of this tensile stress to the root would result in the rapid condensation of water from the surrounding soil by the capillaries of the root-surface. The power possessed even by a root injured by lifting from the soil, of condensing water vapour from a damp atmosphere, was shown by experiment. A system, consisting of two porous pots connected by a tube, when filled with water enabled the authors to illustrate how the "leaf" exposed to the air gives off vapour, while the "root" buried in damp earth supplies the demands of the "leaf," and an upward current in the connecting tube is thus established as in the case of the living plants. (*Nature*, li., 93).

M. Roze has investigated the Eoballium cause of the ejection of the seeds Elaterium. of the squirting cucumber. By cutting off, or making an opening in, the apex of the fruit at different stages of maturity, he found that the force exerted is in proportion to the ripe- ness of the fruits, for when the seeds were still white and immature they were expelled slowly and one by one. The pressure exerted appears to take place almost equally in a longitudinal and trans- verse direction, since whether the opening in the nearly mature fruit was made at the apex or in the side, the seeds were expelled in both cases. When the fruit from which the seeds had been ejected was cut open longitudinally a centrifugal action was indicated, the dissepiments, still swollen with liquid, becoming raised, while the walls of the fruit seemed to be depressed, but when the unripe fruits were cut an opposite or centripetal action seemed to take place, the two halves of a fruit cut longitudinally closing rapidly until the surface of the cut diminished to nearly half its width, caused probably in part by the sudden release of the seeds; the halves then curved into the form of an arc. The author alludes to the changes that take place in the chlorophyll of the epidermis, but does not seem to have noticed the explanation of the cause of the ejection of the seeds given by Fluckiger and Hanbury in *Pharmacographia*. M. Roze has, however, demonstrated the curious fact that the pressure is not due to an access of fluid from the plant, since fruits not mature, with the peduncle attached, placed either in hermetically sealed, or loosely covered, flasks, ejected their seeds in periods varying from four to ten days (*Journ. de Bot.*, viii., 308).

An illustration of this plant, which Willughboda is stated to yield a good indiarubber Firma. in the Malay Peninsula and Archi- pelago, from Sumatra to Borneo, is given in the *Icones Plantarum*, Pl. 2344. It appears from the material at Kew that there are several varieties of the plant, but the form figured is considered by Dr. Stapf to be the typical one described by Blume.

Respiration in Plants. Berthelot and André showed, some time ago, that the leaves of different plants gave off a certain proportion of carbon dioxide when heated between 100° and 110°, in a current of hydrogen. This liberation is independent of biological phenomena or of the presence of oxygen, and would seem to indicate the existence in leaves of compounds which are easily decomposed, giving off carbon dioxide. Substituting air or oxygen for hydrogen, double the quantity of carbon dioxide was liberated, this phenomenon demonstrating the presence of oxidisable compounds, also capable of yielding carbon dioxide. The relation between the oxygen absorbed and the carbon dioxide produced was investigated, and it was found that the amount of the former constantly exceeded that of the compound gas. It was thus apparent that the products of the oxidisable matter in the leaves can be accumulated under certain conditions, independently of the carbon dioxide exhaled, the absorption of the one gas and generation of the other not being directly connected, as in the case of the higher animals. Recent experiments on the purely chemical formation of carbon dioxide by the decomposition of certain proximate principles in leaves, have been performed chiefly with those of the ivy. They were dried at 110°, powdered, and heated in an atmosphere of hydrogen, on an oil bath maintained at 120° to 130°, with a 12 per cent. aqueous solution of hydrochloric acid, until the carbon dioxide was obtained. These conditions are similar to those under which furfural is produced, and the authors have now been induced to initiate experiments in which definite proximate principles shall be treated singly, instead of continuing to work on leaves. In one such experiment cane sugar was operated upon under the same conditions as the leaves, and carbon dioxide was similarly disengaged, whilst furfural and certain acids were also formed. Other experiments, in which various carbohydrates are employed, are now proceeding, and, it is hoped, may throw some light upon the origin and composition of the compounds examined, as well as upon the nature of the chemical reactions occurring in connection with the respiration of plants (*Comp. rend.*, cxix, 711).

Pilocarpus Microphyllus. In the *Icones Plantarum* for November, Pl. 2331, an illustration is given of the small-leaved Jaborandi plant which was named by Dr. Stapf *Pilocarpus microphyllus*. The leaves of the plant are imparipinnate, with about three pairs of leaflets, sometimes reduced to two pairs only, and the raceme is probably only one and a-half to two inches long. The flowers are described from the bud, and the fruit from a carpel picked out of the leaves sent to the Kew Museum as a new Jaborandi by Messrs. Evans, Sons and Co., of Liverpool.

Tabernanthe iboga. A remarkable plant used by the natives of the Gaboon and Congo is described and illustrated in the *Icones Plantarum*, Pl. 2337, under the name of *Tabernanthe iboga*, Baill. The root was first sent to Kew in 1883 by Dr. Hugo Mueller under the native Congo name of "Bocca root," and was said to be much used, and valued on the Lower Congo as a febrifuge. Professor Baillon says that it is known at Cape Lopez as "Iboga," and that it is the "Aboua" of

the Pahouina, and the "Oboueta" of the Gaboon. The latter people are said to consider it to be intoxicating, aphrodisiac, and to prevent a tendency to sleep. From a botanical point of view it differs from the genus *Tabernaemontana* chiefly in the consolidation of the carpels.

Platinum as an Accumulator. Cailletet and Collardeau, in a paper on the condensation by porous bodies of hydrogen produced during the electrolysis of water, give the results of experiments showing that poles formed of spongy platinum and palladium, or finely divided gold, iridium, or ruthenium, condense the electrolytic gases, and produce a gas battery which, on subsequent connection of the poles, is capable of giving up the stored energy. The metals of the platinum family alone seem to form accumulators of condensed gas, of which the capacity increases with the pressure. With silver, tin, nickel, cobalt, and carbon, this is not so, but in the case of platinum and iridium the storage capacity attained may greatly exceed that of the ordinary lead accumulators. In connection with this subject M. Berthelot referred, at the meeting where the paper was read, to the fact that platinum, palladium, and analogous metals form in the salt definite combinations with free hydrogen and oxygen. Thus platinum forms two hydrides, one of which is stable at 200° whilst the other is associated by cold. It is to these compounds the properties are due which were formerly attributed to the occlusion of gases. Two platinum electrodes charged with hydrogen and oxygen respectively and immersed in acidulated water, would develop an electric current, and this fact explains the formation of the new accumulators (*Comp. rend.* cxix, 830).

Digestion without Ferments. A. Dastre still maintains that the so-called "saline digestion" (*Pharm. Journ.* [3], xxiv., 1906, 1087) is due neither to soluble ferments nor to microbes. With regard to the former, he contends that the digestive ferments cannot possibly act in such strongly concentrated saline solutions as he has employed in his experiments, albuminoid matter under such circumstances remaining unaffected by them. As to microbes, no trace of such could be detected in the medium in which the saline digestion is taking place. Finally, the detailed results published of some additional experiments, in which the presence of soluble ferments and microbes was carefully avoided, and digestion proceeded apparently by the action of saline solutions alone (*Comp. rend.*, cxix, 837).

Circulation of the Blood. In the Harveian Oration delivered before the Royal College of Physicians, Dr. Lauder Lindsay mentioned an interesting experiment by which Mozzo shows that blood flows in increased amount to the seat of greatest activity in the body. When a man lay upon a carefully balanced board commencing to think, the increased flow of blood to the head tilted the board downward at that end. An interesting note in Rees' 'Encyclopædia' indicates some knowledge of the circulation of the blood was possessed by anatomists long before the time of Harvey, to whom the discovery is usually attributed. The fact that the blood circulates

through the lungs was clearly stated by Servetus in his 'Restitutio Christianismi,' a work which he published anonymously, but of which Calvin proved him to be author. For writing this work Servetus was burned in the forty-fourth year of his age, in 1553, with the approval of both Calvin and Melancthon. The fate of this work has been not a little singular, all the copies having been burned along with the author by the implacable Calvin, save one secreted and saved by Dr. Colladon, one of the judges. After passing through the library of the Landgrave of Hesse Cassel, this copy came into the hands of Dr. Mead, who endeavoured to give a quarto edition of it, but before it was nearly completed, it was seized by John Kent, messenger of the press, and William Squire, messenger in ordinary, on May 27, 1723, at the instance of Dr. Gibson, Bishop of London, and burnt, a few copies excepted. Although Harvey's work was less severely treated, he met with the stoutest opposition from the faculty, and even from those who were not interested in maintaining the old order of things, and he complained to a friend that his practice had considerably declined since the publication of his discovery.

Atmospheric Variations in the higher Atmosphere. The presidential address of Mr. Richard Inwards to the Meteorological Society contained an account of some observations by M. Hermite on the temperatures and pressures at various heights in the atmosphere. The experiments were conducted by means of captive balloons carrying the necessary instruments. One of the balloons rose to a height of ten miles, and registered a pressure of only 4.1 inches of mercury, and a temperature of 104° F. below zero! It was found that the temperature does not fall regularly during the first twelve thousand feet above sea level, but the fall is believed to be fairly regular at greater heights, and amounts to about 1° F. for each 330 feet of rise.

Meteorites The meteoric iron and the meteors containing iron, which reach the earth, are usually coated with a black crust produced by the intense heat generated by their passage through the atmosphere, the body of the meteor, when not metallic, being greenish. M. Enrichs, however, describes in the *Comptes rendus* a meteor whose surface was entirely white, the interior being almost black. The crust consisted of selenium sulphide, probably produced by the action of heat, as a similar coating was formed when a portion of the black substance was heated in the hottest part of a blow-pipe flame. In connection with this subject it is interesting to remember that in 1891 Mr. Foote discovered diamonds in a meteorite found in the Cañon Diablo, Arizona, a discovery of interest in relation to the opinion that the diamond is of igneous origin.

Determining the Density of Solutions. Messrs. Kohlrausch and Hallwachs describe in *Wiedemann's Annalen* a method of determining the specific gravity of very dilute aqueous solutions with greater nicety than has hitherto been attained. It consists in weighing a glass globe suspended in the liquid by a single cocoon-fibre. From the weight of the globe in pure water, and also in the solution to be tested, the

specific gravity is calculated as usual. The liquid being tested is mixed by means of a glass rod bent into a horizontal ring and carrying a ring of platinum foil. During the stirring operation the globe is supported by another ring. The thermometer used for ascertaining the temperature may be read to a thousandth of a degree by means of a telescope, but the balance used for weighing need not be of excessive delicacy. Although the globe weighed nearly 2000 grains in air, it was of such a size that it weighed less than 60 grains when suspended in water, so that the maximum weight which the silken thread was required to support never exceeded 60 grains in the experiments carried out by these observers. Their observations are said to have given indications to about the millionth part of the density determined.

THE DISCOVERY OF OXYGEN.

INTRODUCTION.

At a time like the present, when chemistry is advancing by leaps and bounds, and being enriched by fresh discoveries of almost daily occurrence, it is difficult to realise that its claim to be regarded as an exact science is practically based on the results of investigations undertaken within little more than the last hundred years. But, in truth, it was not until Lavoisier rounded off his own researches by interpreting the phenomena disclosed by the labours of Black, Cavendish, Priestley, and Scheele, that any such claim was at all justified. Chief among the mass of material collected by his illustrious predecessors and co-workers were the facts ascertained by Priestley, in England, and Scheele, in Sweden, regarding oxygen gas, which they discovered independently of each other and almost simultaneously. This discovery afforded Lavoisier one of his most potent weapons in waging war upon the phlogiston theory, and served as the basis of the new system which inaugurated the modern era of chemistry.

But long before the actual discovery of oxygen, the idea was prevalent among chemists that, in some way, there was a connection between the air—then regarded as an elementary body—and nitre. It was observed that fire cannot exist without air, but that nitre produced the same effect as a blast of air, i.e., it caused greatly augmented combustion. Metals also were calcined by the aid of nitre or its spirit (nitric acid) as well as in a current of air. Accordingly, it was common to speak of the presence of nitre in the air, and Robert Hooke, in his "Micrographia," published in 1665, asserted that it was the constituent of air fixed in saltpetre which effected combustion. Hooke's experiments were continued by John Mayow, who identified the "dissolving part" of air and of saltpetre under the name of nitre-air or fire-air, and regarded it as an essential constituent of all acids. He also assumed it to be the cause of fermentation and putrefaction, and proved that it is essential to respiration, which he showed to be analogous to combustion. He further demonstrated the mixed nature of air, recognising in it a supporter of life and combustion, heavier than the air itself, and a body lighter than air, incapable of supporting life or combustion.

THE PHLOGISTON THEORY.

About this period, however, Beeccher and Stahl's theory of phlogiston was propounded, and soon gained general acceptance, the work of Hooke and Mayow being apparently quite lost sight of for the time. That theory explained the phenomena of combustion and other analogous processes by the assumption of the hypothetical phlogiston, "the most pure and simple inflammable principle"—not actual fire but the principle of fire. Phlogiston was originally understood to be a very subtle, invisible substance, capable of penetrating the densest matter and conferring negative weight. Later, it was identified with hydrogen, but the theory had been, by that time, discarded as a working hypothesis by most chemists. All combustible bodies were supposed to be very rich in phlogiston, which they lost when burned; on the other hand, the assimilation of phlogiston by unflammable substances resulted in the formation of inflammable compounds. The rusting of iron, the calcination of lead, and the production of sulphuric acid by burning sulphur, were attributed to loss of phlogiston; and the reduction of metallic compounds to the assimilation of this imponderable principle. In other words, what we now term oxidation was regarded as loss of phlogiston, and de-oxidation as the reverse.

The work of both Priestley and Scheele, as will be seen later, was vitiated by their belief in the phlogiston theory, which influenced chemistry for a whole century and hindered their full comprehension of the phenomena observed during their labours. It was reserved for Lavoisier to carry the results obtained to their logical conclusion and so explode the hypothesis which had now become more than ever a check upon the progress of the science. The observations of Priestley and Scheele with respect to oxygen (so named by Lavoisier, from *ξύς*, acid, and *γεννάν*, to produce) enabled him to establish his theory of combustion or oxidation, according to which, substances burn only in oxygen and increase in weight proportionately to the amount of oxygen consumed in the process. Cavendish had already shown that water alone is produced by the combustion of hydrogen, and Lavoisier was thus able to state the real composition of water. He also correctly interpreted the decomposition of water by red-hot iron, its formation when metallic oxides were reduced by means of hydrogen, and the generation of hydrogen when metals were dissolved by acids, since he saw that the hydrogen came from the water and that the oxygen from which it was liberated united with the metal to form oxide, which in turn combined with the acid to form a salt. The outcome of these and other experiments was the general recognition of the non-existence of phlogiston and the confirmation of Hooke and Mayow's opinion that one only of the two normal gaseous constituents of atmospheric air is essential to combustion, calcination, and respiration. Lavoisier was thus enabled to translate into simple antiphlogistic language, the obscure and erroneous reactions in which phlogiston was assumed, and, by the joint labours of Priestley, Scheele, and himself, to raise upon the ruins of the phlogiston theory the structure of modern chemistry. The manner in which the great discovery was made by the two

investigators, Priestley and Scheele, whose results agreed though their methods differed, must now be described, and with a view to showing the difficulties under which they worked, the accounts will be couched as far as seems advisable in the language of the originals.

(To be continued.)

REVISION OF THE PHARMACOPŒIA.*

"In reference to the important subject of the British Pharmacopœia, I would recall the attention of the Council to the subject by a reference which I made to it in the address which I had the privilege of delivering in November, 1893:—

'Another matter of importance which I have to report has relation to the Pharmacopœia. The Council will remember that during the Session of May, 1892, a communication had been received from the Secretary of State for India on the subject of reports forwarded from the medical authorities in that country, pointing out certain inconveniences which resulted from their being required, according to the British Pharmacopœia, to use certain drugs which could be substituted by others of an equivalent value, indigenous to India, without incurring the expense of importation. Other matters of importance and interest were likewise indicated.

'At the meeting of the Council in May, 1893, the Pharmacopœia Committee was authorised to enter into correspondence, through the Privy Council, with the India Office and the Colonial Office, with a view of ascertaining in what degree, if any, the British Pharmacopœia could be better fitted than at present to meet Indian and colonial requirements as regards important natural drugs and pharmaceutical preparations.'

"The replies to the communication thus authorised (twenty-eight in number) have been very satisfactory. They have been received from the East and West Indies, and from the colonies and dependencies in South Africa and Australia. A full statement concerning these communications will be submitted to the Pharmacopœia Committee by Professor Atfield, and subsequently they will be laid before the Council by the Committee.

"I need scarcely remind you of that with which we are all familiar, viz., the discussion which is taking place as to the relations between the mother country and the colonies, and between the various colonies themselves.

"It will therefore be regarded as a fortunate coincidence that at this moment the Council should have determined that the members of the medical profession in this country and those members of the profession practising in those remote regions in which British thoughts, British feelings, and British wants predominate, should become more closely bound together, and that the Council should be prepared to utilise the valuable suggestions which they have received from these dependencies, and thus to render

* Extract from the address of the President of the General Medical Council, Sir Richard Quain, Bart., at the opening of the fifty-seventh session.

the Pharmacopœia not merely English, but British in the widest sense of the term.

"And here I feel it my pleasing duty to acknowledge the readiness with which the Privy Council Office, through Sir Charles Peel, undertook to communicate with the India and the Colonial Offices, and also to notice the very excellent results which have accrued from these communications. We have to express our acknowledgments to these several departments for obtaining for us the necessary returns, which have been very readily and abundantly supplied by the medical authorities in India and the colonies."

THE PROPOSED 'IMPERIAL' PHARMACOPŒIA.

The publication of the following expressions of opinion by several representative British pharmacists, in reference to this aspect of pharmacopœia revision, seems peculiarly appropriate in the present number of the Journal, and, it is hoped, may lead to the formulation of some general consensus of opinion on a subject of primary importance to pharmacists throughout the British Empire:

"It may be assumed that the British Pharmacopœia is already the principal guide or authority used in the colonies by medical practitioners and pharmacists in the prescribing and dispensing of medicine, although some other pharmacopœias may be occasionally required, as in this country. The British Pharmacopœia is, therefore, in the voluntary sense, the Pharmacopœia of the entire British Empire. The more the work be brought up to date as a 'British Pharmacopœia,' the more it may be expected to command the respect of the colonies. This is particularly noticeable in the recommendations which have been received from Victoria, Australia. Many of the suggestions might well have emanated from a committee resident in Great Britain, and reporting upon the British Pharmacopœia. The difficulty commences when the purely colonial side of the subject is considered, namely, the extent to which species and localities, which would not otherwise be recognised in a 'British Pharmacopœia,' should be included in an 'Imperial Pharmacopœia,' which nevertheless has to be the official guide for this country.

"It is well known that, even in a small area such as Great Britain, certain drugs and medicinal preparations are in favour in some localities, but quite neglected in others, and this is likely to obtain to a much greater extent when the area is increased so as to include the globe.

"It has been stated that theories of this kind must depend upon the supposition that the indigenous remedies are specially useful for ailments which are peculiar to particular countries; but that argument would apply equally well to the continent of Europe alone, and yet a 'European Pharmacopœia' would be almost an impossibility.

"It appears, therefore, that the question how far an 'Imperial Pharmacopœia' (from the point of view of a compulsory authority for all the colonies) is desirable or feasible, can only be settled by the colonies themselves. If they will be satisfied to be ruled by an improved British Pharmacopœia, then, as

a matter of course, it would become an 'Imperial Pharmacopœia'; if, on the other hand, they would desire a complete revolution of the lines upon which the British Pharmacopœia exists, then British pharmacy might lose more than colonial pharmacy would gain. An obvious alternative is to have appendices for such colonies."

"That the national Pharmacopœia should suffice for the needs of all the British Colonies and possessions was an idea actuating the General Medical Council in its production, for in the preface to the 1867 issue it is distinctly said to be 'intended to afford to the members of the medical profession and those engaged in the preparation of medicines throughout the British Empire one uniform standard and guide, whereby the nature and composition of substances to be used in medicine may be ascertained and determined.' While the term 'Imperial British Pharmacopœia' is suggestive of a palpable contradiction in terms, it is difficult to conceive what further meaning can be conveyed by the term 'Imperial Pharmacopœia.' There is, therefore, no novelty in the adaptation of the Pharmacopœia to colonial needs, and the only question to be considered is how that object may be secured most effectually.

"With regard to the extent of the modifications allowable on this ground, there is clearly no occasion for flooding the Pharmacopœia with colonial-grown drugs, concerning the medicinal value of which little or nothing is yet definitely known. When, for example, Australian rhubarb, opium, essential oils, etc., shall have been proved equal in medicinal virtue to those now official, it will be soon enough to put them on an equal footing. If such drugs are now considered satisfactory by the medical practitioners of the colony, it may be desirable that the use of them should be sanctioned for that colony, without interfering with the established practice of British pharmacists.

"The chief direction in which simplicity can be attained is in modifying existing formulae, and omitting a number of substances which have practically gone out of use, but have hitherto been retained through sentimental considerations. The directions for preparing substances of definite chemical composition could very well be omitted in all cases. Among galenical preparations many of the processes for making extracts in the present edition are obsolete, and are perhaps rarely followed in their entirety by persons engaged in their manufacture. Re-percolation might be utilised for some, with the object of reducing the volume of liquor to be evaporated, and in the case of the liquid extracts—ergot, for instance—a judicious application of that process would obviate the necessity of evaporating any but the last and weakest percolate. Speaking generally, in many of the present processes too much menstruum is employed, leading to a waste of time and material, in addition to the deterioration generally resulting from prolonged application of heat to vegetable products.

"The tincture processes need revision as to the alcoholic strength of the menstrua employed, for the elucidation of which a good deal of work has been already

done. A more intelligent application of the principles of percolation is also required, since the advantages of the process are only partially secured by the directions now given for making the percolated tinctures. The juices, if retained, should be standardised, or at least those of belladonna, hemlock, and henbane. The possibility of utilising chloroform as a preservative in place of the more expensive alcohol, in some cases where the solvent action of the latter is not required, is also worthy of consideration.

"The formulæ for enemas might be omitted; probably the present official enemas are little used, these preparations [being usually made extemporaneously as required. The same applies also to the poultices. Let anyone who has prepared a linseed or mustard poultice consider how far the official directions have been followed. The formulæ for suppositories are also unnecessary. Even in the case of the substances from which the official suppositories are made, other strengths than those ordered are required. It might perhaps be advisable to indicate officially the weight and the basis to be employed, unless otherwise ordered, and then all the present formulæ could be omitted, the prescriber ordering what he wished and the amount for each suppository.

"Speaking generally, it would seem advisable to make official only such simple galenicals as are required for exhibiting the active properties of the various drugs, and leave the combination of these in the form of mixture, pill, suppository, etc., to the prescriber. In certain cases where a prolonged or complicated process is necessary to secure the desired result, *e.g.*, ungu. hydrarg., special formulæ may be advisable, but all simple mixing of substances, as in many of the ointments, where again strengths other than those official are frequently employed, might well be omitted. Otherwise, to be logical, formulæ for mixtures, pills, ointments, etc., should be made official for all drugs commonly used in those forms—a proceeding which would undoubtedly lead to the further extension of factory-made physic. The reduction in the number of such unnecessary formulæ would obviously reduce the points at issue between medical practice in the various colonies and the mother country, thus facilitating the removal of any possible obstacles to the recognition of the British Pharmacopœia as the authoritative standard for the whole empire."

"It is quite reasonable to assume that the time has arrived when the Pharmacopœia should be constructed on a broader basis, including the drugs and formulæ now used almost exclusively in our colonies, and thus constituting an 'Imperial Pharmacopœia.' This brings with it new editorial responsibilities, and is a subject for serious consideration amongst British pharmacists. It is usually expected by medical men that the dispensing chemist will have in stock all the drugs and preparations contained in the Pharmacopœia, and if there is to be a large addition, it means, possibly, an increase of stock for which there will be but little demand. But this evil is not so great as would at first appear, and when the matter is gone into it may be found that the necessary additions are not so very

numerous. We owe something to our colonies for valuable remedies already introduced into this country, and any increase in this direction should be welcomed and recognised by rendering such remedies official. It may be expected, too, that an Imperial Pharmacopœia would come into more general use amongst our colonial brethren than the British Pharmacopœia now does. From a commercial point of view there would be material advantages, as no doubt an increase in the import of drugs and export of preparations would follow. We should thus be using to the best advantage the means at our disposal for the mutual advantage of all concerned."

"It must be borne in mind that our Pharmacopœia is primarily a British Pharmacopœia. Therefore our conception as to what should appear in it need not, on the one hand, embrace everything that may be employed in each colony of the empire, nor, on the other hand, must it be limited to the drugs in vogue in any one part of the British Isles. And, just as conditions of space affect it, so also must time. It must be remembered that 'possession is nine-tenths of the law,' and that therefore it would take very much stronger evidence in favour of the admission of a new drug into the Pharmacopœia than would be necessary to secure the retention of one which is already official. One would almost require to have a sort of guarantee or 'suspense' list into which new drugs might be put in order that their vitality and expectation of life might be certified before passing them on to the Pharmacopœia. It would, indeed, require a cool head to steer through the contradictory suggestions as to deletions or additions which have appeared in this Journal from pharmacists at home, or from our Victorian friends. Still, these suggestions have their value, and all analytical and statistical investigations into prescriptions cannot fail to be of service when the question of selection comes to be decided. If the Pharmacopœia, on the other hand, is to command respect beyond the seas, it is equally plain that the drugs and preparations included must not only fairly represent medical practice in these countries, but must admit of a wide variation to suit the altered climatic conditions. 'It is a far cry to Loch Awe,' but it is a still further cry from the winter of Canada to the summer of India. Our syrups, ointments, and other preparations, should therefore be prepared to accommodate themselves to such differences. These and other considerations point to the necessity of producing, first, a British Pharmacopœia, extended, complete, and up to date on all points, and, after that, adding appendices to satisfy the needs or wishes of our colonies. In these appendices, not only would native plants be recognised, additional drugs and preparations be included, but variations from the British standard in the composition of ointments, syrups, and the like, would be legalised, either specifically or in general terms. In this way alone can we hope to make the Pharmacopœia the standard work and legal referee throughout the empire, without doing injustice to the natural products of the colonies."

"Invitations to the colonies for suggestions respecting the inclusion in the Pharmacopœia of drugs peculiar to the country and already in use there are being responded to; but if one is to judge from the reply from Australia these wants will be satisfied without much difficulty. When the replies are more complete, it will perhaps be found that the demand for an Imperial Pharmacopœia is less pressing than appeared at first sight. In fact, to many who have had practical experience in the colonies, it is astonishing to find how little the professional aspect of pharmacy differs from the conditions that obtain in Great Britain. Probably most, if not all, the medicinal plants indigenous to the various British colonies find their way into the London markets, and, in cases where their value has been well proven, even into the Pharmacopœia itself. This being so, it becomes a moot point whether the Pharmacopœia brought thoroughly up to date will not be 'Imperial' in the widest sense. Any difficulty that might arise could be met by foot-notes under the various headings, authorising the substitution in the colonies of certain native products for those officially presented for use in Great Britain. For instance, under the title 'Oleum Olivæ,' permission might be given to substitute 'Nut Oil' or 'Sesame Oil.' Should such latitude not be found sufficient to meet colonial requirements, it would then be necessary to consider whether it would not be more advantageous to issue a series of appendices instead of altering the character of the existing work. Although the question of an 'Imperial Pharmacopœia' is receiving the lion's share of attention, it is doubtful if it involves such weighty considerations as the replacement of the present weights and measures by the adoption of the metric system would do. Another point that will claim the careful attention of the revisors, is the standardising of the more potent preparations in the Pharmacopœia. Although much valuable work has been done in connection with that subject, it is doubtful if our methods are sufficiently reliable for incorporation into the standard work, since pharmacopœial requirements and assay processes are liable to be made the basis of legal prosecution by public analysts."

LATEX-HAIRS OF THE CICHORIACEÆ.

Herr L. Kny has investigated the cause of the excretion of latex which takes place when the scales of the involucre of various species of *Lactuca*, *Sonchus*, *Mulgedium*, *Prenanthes*, *Picris*, and *Lapsana* are subjected to slight pressure. The example specially studied was *Lactuca scariola*. The laticiferous system follows, in general terms, the course of the vascular bundles; but its ultimate branches became detached from the latter, and, in places, pierce the epiderm in the form of narrow cylindrical hairs filled with latex. They are found almost exclusively on those portions of the bracts which are not covered by other bracts; each of the outermost whorl of bracts may have not less than from sixty to one hundred. They are readily distinguished by their form, and by their very thin wall, as well as by their contents, from the ordinary papillæ of the epiderm (*Sitzber. Gesell. Naturf. Freunde*, Berlin, 1893.)

Pharmacy at Home and Abroad.

The following information has been compiled so as to enable comparison to be made between the conditions of pharmacy here and elsewhere, the particulars concerning Great Britain being intended chiefly for the benefit of readers abroad, but also, in a lesser degree, for those British pharmacists who do not appear to have thoroughly grasped the bearing of the Pharmacy Acts, 1852 and 1868, upon their business, or realised the limitations of the powers possessed by the Pharmaceutical Society of Great Britain.

It cannot be too plainly recognised that proper training and qualification of pharmacists in this country is enforced by the State, simply as the best means of ensuring the safety of the public in respect to the sale and dispensing of poisons. State protection of the general business of pharmacy is not afforded, being but partially secured by passing the qualifying examination. Further, it is doubtful whether the legal powers conferred by the Acts upon the Pharmaceutical Society could be fully exercised unless the Society comprised the whole, or practically the whole, of the registered chemists in the country. In that case protection would be possible from within. By increasing the stringency of the entrance examination, insisting upon a real apprenticeship with a thorough course of technical training, and by maintaining the standard of qualification at the highest rather than at the lowest level, much might be effected. Still greater results would be obtained if the Society were a 'Federation' of the whole trade, if pharmacists in business refused to receive pupils who had not passed the scholastic examination, and if all registered persons steadily refused to play into the hands of unqualified opponents by affording them legal protection for the sake of a temporary advantage.

In many instances the time has not sufficed to procure exact information regarding the conditions under which pharmacy is practised in places abroad, and in others the information received is not so full as could be desired. It is requested, therefore, that anyone who can supply what is lacking, or amend what is now published, will kindly communicate with the Editor. To those who have already supplied information, much too numerous a body to be communicated with individually, the fullest thanks are hereby tendered.

GREAT BRITAIN.

The practice of pharmacy is less protected in this country than anywhere else in Europe, being, with certain limitations, free to everyone, without proof of training or qualification. The only protection accorded to registered persons is in respect of the titles—chemist and druggist, chemist, druggist, dispensing chemist or druggist, pharmacist, pharmaceutical, pharmaceutical chemist—and the sale or dispensing of such poisons as are scheduled under the Pharmacy Act of 1868. Even this protection partially fails as regards limited liability companies and other corporations, which, not being "persons" under the Act, are able to encroach upon the province of the pharmacist to the fullest extent, without let or hindrance, so long

as the business of a company is actually conducted by registered persons.

Registration has been enforced since 1868, and is granted after the candidate has passed an approved scholastic examination in Latin, English, and arithmetic; shown proof of three years' training in dispensing; and, after attaining the full age of twenty-one years, passed a further examination—the "Minor"—in prescription reading, practical dispensing, pharmacy, *materia medica*, botany, chemistry and physics, practical chemistry, and the law relating to the sale of poisons. This examination occupies two days: it satisfies all legal requirements, and successful candidates are entitled to call themselves "chemists and druggists." The title of pharmacist, pharmaceutical, or pharmaceutical chemist can only be assumed by chemists and druggists who have proceeded to a higher examination, the "Major," which is purely voluntary. The subjects of examination are botany, *materia medica*, chemistry, and physics, all of a more advanced character than in the "Minor," and embodying more practical work. The "Major" extends over three days, and successful candidates secure an extra privilege in being exempt from jury service. Pharmaceutical chemists are eligible as "Members" of the Pharmaceutical Society of Great Britain, and chemists and druggists are now eligible for election as "Associates," whilst it is proposed to extend the privilege of membership to all duly registered persons.

The Society was established as a purely voluntary body in 1841, and incorporated by Royal Charter in 1843, after which all persons desiring to become members of the Society were required to be examined as to their fitness to carry on the business of pharmacy. In 1852 the first Pharmacy Act was passed, restricting the title of "pharmaceutical chemist" to persons who were already members of the Pharmaceutical Society, or should afterwards show proof of their skill and knowledge on examination. A register of pharmaceutical chemists was prepared in accordance with this Act. Later, the Act of 1868 was passed in response to public demand for a Poisons Bill, and a Poisons Schedule in which more and less potent agents are placed in separate classes, was then established. It was recognised by the Legislature that in the proper education of vendors of poisons lay the best assurance of the safety of the public, and accordingly the regulation of the practice of pharmacy for the purposes of the Act was entrusted to the Pharmaceutical Society, which had proved its fitness to be entrusted with that responsibility. Nothing in the Act extends to the business of medical practitioners, the making or dealing in patent medicines, nor to the supply of poisons by wholesale, so long as the regulations with respect to the labelling, etc., of poisons are observed.

As will have been gathered from what has been already stated, the 1868 Act is an imperfect one, in that it not only fails to restrict the practice of pharmacy to a properly educated class, but also only partially protects those who are legally qualified in accordance with its provisions. Even the Poisons Schedule is undesirably limited, and repeated attempts to extend it have been defeated by the action of the Privy Council, which controls the action of the Society in this respect. Again, though the educational

standard of chemists and druggists has been steadily raised by the increasing stringency of the qualifying examination, the efforts of the Society in this respect have been in great measure neutralised by the lack of legal powers to insist upon candidates producing evidence of having undergone a proper course of scientific and technical training.

Seeing then that, as might be expected in a country where a minimum of State interference is tolerated by the people, the progress of pharmacy in Great Britain has been virtually by the slow and uncertain path of natural evolution, it is not to be wondered at that the art discloses itself under the most diverse aspects. Instances are readily found to illustrate every step in the process of development, from the miscellaneous dealer in drugs, grocery, drapery, ironmongery, etc., etc., to the high-class pharmacist who confines himself to pharmacy pure and simple, whilst at times acting as an expert in chemistry, bacteriology, and general hygiene. The future is very uncertain, but the educated pharmacist has, within the brief course of half a century, proved his ability to fill a gap in the social economy, and his chief need would now seem to be the recognition of the fact that—in a community where all institutions are, and are likely to be, undergoing change—he must be constantly prepared to adapt himself to modifications in his environment.

IRELAND.

In the sister island, which possesses its own pharmacy laws, pharmaceutical chemists enjoy an extra privilege as compared with their English and Scotch brethren, in that they possess the exclusive right to compound medical prescriptions.

Candidates for the qualification of pharmaceutical chemist are required to pass a preliminary examination in Latin, English, arithmetic, algebra, and geometry, as well as one of the following optional subjects:—elementary physics and mechanics; the rudiments of botany; elementary chemistry; French, German, or other modern language. This examination, it is evident, is a much better test of scholastic education than the corresponding British one, and, unlike the latter, it must be passed at least twelve months previous to entry for the licence examination. Candidates for this must be twenty-one years old and have acted as apprentice or assistant for four years or more, besides attending a three months' course in practical chemistry. The subjects of examination are botany, *materia medica*, general and pharmaceutical chemistry (including physics), and practical pharmacy (including prescription reading and knowledge of the law relating to the sale of poisons). It is practically equivalent to the "Minor" examination under the British Act. Chemists and druggists and registered druggists under the Irish Act are entitled to keep open shop for the sale, retailing, or mixing of poisons, but not to compound medical prescriptions. The first must have been in business as principals before 1890, and are examined in reading, writing, arithmetic, and the appearances of the poisons, drugs, and chemical salts in common use. Registered druggists must have served as apprentice or assistant for four years, and are examined in English orthography

and composition, arithmetic, the weights and measures of the British Pharmacopœia, and the appearance and properties of the various drugs and chemicals in common use.

CANADA.

The regulation of the practice of pharmacy in Canada is vested in the various provinces which compose the Dominion, each of them being competent to legislate for the purpose. As a matter of fact they have nearly all taken advantage of the privilege, as pharmacy laws exist in Ontario, Quebec, Nova Scotia, Manitoba, New Brunswick, British Columbia, and the North West Territories, this being also the order of sequence. The various Acts are more or less modelled after that of Ontario, which was passed in 1871, and, in turn, was based on the Act of 1868 of Great Britain. In all cases the regulation of pharmacy is controlled by provincial associations, or societies, which are generally so styled, but, in the case of Ontario, the body corporate is called a "college of pharmacy." The members of these societies were originally resident druggists, or qualified assistants, who were so engaged when the laws were enacted, but, since then, admission has been by examination, or the recognition of qualifications elsewhere obtained. The affairs of these societies are governed by councils elected and constituted similarly to that of Great Britain. The annual fees payable by the members of the various organisations range from four to ten dollars, and those in default are considered legally unqualified as druggists.

The laws as to the registration of assistants and apprentices are not the same. In Quebec and Manitoba all apprentices and clerks are required to pass specified examinations, register, and pay annual fees; and are then said to be "certified." In British Columbia there is a grade of "certified apprentices," but, in the other provinces, the statutes do not demand a registration of either assistants or apprentices. In Ontario, a register of apprentices is kept, and a fee of one dollar exacted by the so-called college. The sale of poisons is carried out in Ontario, Nova Scotia, Manitoba, British Columbia, and the North West Territories, in a manner similar to that specified by the British Act, the poison schedules being similar, and also divided into two parts, but, in Quebec and New Brunswick, this division is not made, and the full regulations, which in other places are only applicable to the first part, are in these provinces enforced in regard to the whole list.

The right of physicians to practice pharmacy appears to be encouraged in Ontario, as the amended Act contains a special provision for the registration of doctors as druggists. In Nova Scotia, Manitoba, British Columbia, and the North West Territories, they are not interfered with. In New Brunswick they need not pass an examination, but must register as druggists, and this regulation also obtains in the Province of Quebec, except in the cities of Quebec and Montreal, where physicians opening drug stores must cease to practice their former profession, and must not lend their names to businesses of which they are not the owners. Since the amendment of the Pharmacy Act

in Ontario, this mode of evading the law has become exceedingly common, and was the principal subject of discussion at the last meeting of the council of that province.

The administration of the law is vested in the various pharmaceutical bodies, but they do not in general show much activity in carrying it out. In Quebec there have, of late, been several important prosecutions with varying results, but elsewhere the condition is one of legal apathy. The vexed question of the responsibility of the seller has not been prominently brought forward as in England, but as the laws in Canada are generally similar to our own, it is probable that the development of this feature is only a question of time.

Competition in prices has during the last year or so set in in some of the larger cities where bazaar stores exist. In some of these omnivorous establishments proprietary medicines, soaps, toilet articles, and such like, are sold at figures which would not allow a profit to small dealers, and it is accepted as a sign of the times that druggists' prices will never again be realised. A feeble attempt was made in Toronto to prosecute a large "dry goods" house—formerly doing business as drapers, but latterly adding almost everything else, including drugs—for selling a proprietary compound of which poison was a constituent. The case was not so successfully treated as has been the rule here, and, though a fine was inflicted, it was only nominal, and the house continued to do business as before. An attempt was then made to obtain amendments to the Ontario Act, by which the sale of proprietary medicines containing poison was to be restricted to druggists, but not only did the Legislature ignominiously dismiss the Bill, but passed another, by which all interference with such medicines is prevented. Class legislation has become very unpopular, and it is thought by those who should know that any further tampering with the commerce of pharmacy will result in the loss of most of those privileges which druggists have fought so hard to acquire.

The only hope of druggists seems to be in dispensing, but, unfortunately, in all but the larger cities and towns, the doctor puts up his own medicine, or if he sends a prescription to a druggist he expects a large percentage of the receipts. The granting of this commission is a very general thing, and we are led to understand that competition is so close between druggists that the initiative is not always taken by the doctor.

The recognition of qualifications other than those obtained by examination in the several provinces is in general left to the discretion of the respective councils or boards of examiners. In Quebec the Act specifies the certificate of pharmaceutical Boards whose educational requirements equal their own. In Ontario the Act mentions the "diploma" of the Pharmaceutical Society of Great Britain, and in British Columbia a similar "diploma from some reputable college of pharmacy" duly authorised by the laws of Great Britain is recognised. In New Brunswick "the diploma of any other competent body" is mentioned, and, in Manitoba, the certificate or diploma of some legally

qualified college or association may be accepted, while in the North West Territories such associations must be in Her Majesty's dominion. In most cases these qualifications must be submitted to the approval of the governing body, so that the power of rejection is thus really placed in their hands. It is likely that should a specified qualification not be recognised, the council or board might be required to show cause for such action. The Ontario college has already refused to recognise the qualification of any organisation which will not reciprocate, and the Pharmaceutical Society of Great Britain is one of these, as is also the Quebec Association.

A step in advance of this has lately been taken by the Ontario council, which has exercised its alleged discretionary power in discriminating between individuals holding a recognised reciprocal qualification. An American gentleman, who is now "dean" of the Ontario teaching college, was registered as a chemist and druggist, on the strength of a certificate of the Board of Pharmacy of the City of New York, while a young Canadian druggist, formerly a student of the Ontario college, who possessed the same qualification was refused registration, and has recently been prosecuted for keeping open shop. Further litigation is reported probable.

Manitoba has also taken a stand against general recognition, and it may be said that there is a strong feeling throughout the Dominion against accepting any qualification except that by examination of the governing body itself. Persons intending to go to Canada should in all cases submit their qualifications and have them decided upon before taking any final step.

Trade does not appear to be very good in Canada, as it shares in the general depression prevalent everywhere, but which is perhaps felt most intensely in the United States. Though the Dominion is largely affected by this, business is better in Canada than across the border, as the people there do not in general soar so high, or fall so low as their neighbours. Prices are, however, low, business is dull, and competition keen, but it is hoped that when the results of the harvest are realised times will improve.

VICTORIA.

In the colony of Victoria the first legislation on pharmacy was passed in the year 1876, an amended Act was passed in the year 1885, and these were consolidated with the Medical Act in 1890. The administration of that portion of the Pharmacy Act relating to pharmacy is under the control of the Pharmacy Board of Victoria, and the members of the Board are elected by the registered pharmaceutical chemists of the colony. The qualifications for registration are that the person shall have passed a preliminary examination before the commencement of his apprenticeship, and have served for not less than four years as an apprentice; have attended one course of lectures and passed examinations during one session at some school or college of pharmacy recognised by the Board, in materia medica, botany, chemistry, and practical chemistry; he must also have attained the age of twenty-one years, and have passed examinations in

practical pharmacy, and any subject that may be prescribed by the Board with the approval of the Governor in Council. The certificates of the Pharmaceutical Society of Great Britain are accepted as fulfilling all the above requirements.

In the Victorian Act the word "person" is specifically denoted as including any corporation, and this clause has been confirmed by the courts, so that Victorian pharmacists are free from the competition of stores conducted by limited liability companies. It is an offence under the Act for unregistered persons to assume any title, etc., which might be construed to suggest the business of a pharmaceutical chemist, and also for any person, not being a registered pharmaceutical chemist, to carry on business as a chemist and druggist or homoeopathic chemist. The name of any registered pharmaceutical chemist convicted of any felony or misdemeanour may be erased from the Register, whereas in Great Britain the power of the Council of the Pharmaceutical Society is limited to terminating the membership of such a person if he happens to be connected with the Society.

A noteworthy clause in the Act is that which stipulates that every pharmaceutical chemist who has an apprenticeship shall allow him a reasonable time, during the last year of his apprenticeship, to attend the necessary lectures before registration, failure or refusal to allow such reasonable time being regarded as a breach of the contract entered into. Prescribing and the practice of medicine or surgery by pharmacists are discouraged by a similar penalty (not exceeding £10) to that incurred by an unregistered person acting as a pharmaceutical chemist. At the same time the rights and privileges hitherto enjoyed in that respect are fully secured. As in the British Act, the *bonâ fide* business of medical practitioners and wholesale dealers is exempted from interference, but "patent medicines" are not mentioned. The business of a deceased pharmacist may not be carried on by executors, etc., for longer than two months, without special permission being granted by the Board. This clause compares favourably with the so-called "Widows Clause" of the British Act, which permits such businesses to be carried on indefinitely so long as a qualified manager is in charge, and undoubtedly constitutes the weakest point in the Act. Regarding it then from every point of view, it will be seen that the Victorian Act is far and away the best drafted of any in force in English-speaking countries, and nearly approaches the ideal. As it is, the prospects of professional pharmacy in Victoria, in the near future, are very bright and promising.

The foresight and wisdom of those pharmacists who had the framing of the Victorian Pharmacy Act is fully exemplified to anyone who chooses to compare the status of the profession as it exists to-day with what it was before these worthy pioneers took the reins for from the state of a mere trade which all classes could practise, it has emerged into a profession and is recognised as such by all classes of the community, many of the pharmacists of Victoria being gentlemen who hold important public positions, and are the recipients of social distinctions of no mean order

It will be no exaggeration to say that the pharmacies of Melbourne and the principal cities of Victoria are on a scale of magnificence which equals anything to be found either in Great Britain or the rest of Europe. Encouraged by these results the other Australian colonies have bestirred themselves with more or less success to obtain legislation on the same lines, their Acts being in fact a copy of the Victorian, but party interests and the various intrigues which are peculiar to parliamentary life, especially in young and democratic countries, have more or less in all cases prevented those who have devoted their best energies to the cause from fully realising their hopes. Yet it is satisfactory to note that in the various colonies each passing year something more is accomplished, and there can be no doubt that it is only a matter of time when the whole of Australasia will be able to boast of possessing pharmacy laws which shall have placed the profession in its proper position, and so guard the best interests and safety of the public.

The College of Pharmacy of Melbourne, the principal teaching centre, is a large and spacious building, fitted with all modern requirements and possessing a staff of teachers of recognised abilities. It numbers amongst its students many from all the various colonies.

The Pharmaceutical Society of Australasia has its headquarters in Melbourne, Victoria. It was founded in 1857 to uphold the status of registered pharmacists, watch the law relating to pharmacy, advance the study of chemistry and pharmacy, and aid pharmacists or their relatives in case of need. The largest proportion of the members live in Victoria, but others are found in New South Wales, Queensland, South Australia, New Zealand, Tasmania, and Fiji.

WESTERN AUSTRALIA.

At the present time it is open to anyone to establish himself in Western Australia as a pharmacist, without possessing the qualifications needed for the proper discharge of the accompanying duties. However, a Pharmacy Bill passed its second reading in the Legislative Assembly on October 16 last, which adds to and consolidates the existing law regarding the sale of poisons and the business of a chemist generally. It recognises, in the first place, the Pharmaceutical Society of Western Australia, which now numbers fifty-five members and is in a sound financial position. It is to be managed by a council consisting of a president and six other members. In the hands of this council is to be placed the registration of chemists, and no person is to be allowed to carry on the business of chemist unless he is so registered. Any person who has attained the age of twenty-one years is to be entitled to registration (a) if for at least two years before the coming into operation of the Act he has carried on the business of a chemist within the colony; (b) if he has been continuously employed for two years before the passing of the Act as a dispensing assistant in a chemist's shop within the colony; (c) if for at least three years before the date of the coming into operation of the Act he has been continuously employed as a dispensing chemist in a

hospital, benevolent asylum, or other public institution in Western Australia; (d) if for at least four years he has served as an apprentice to a chemist in the colony and has passed the examinations required by the Act; (e) if he holds a certificate of competency as a chemist from any society, board, or college of pharmacy recognised by the regulations. The effect of this Bill will be to bring the law in the colony into a line with that of the United Kingdom and most of the other parts of the empire, and, while raising the status of the profession of pharmacy, will also serve to guard the public against being imposed upon and possibly injured by individuals who have no valid claim to the title of druggist.

SOUTH AUSTRALIA.

The Pharmacy Board of South Australia was established by the Pharmacy Act of 1891, which recognises two classes of registered persons—"chemists and druggists," and "pharmaceutical chemists." As in the other Australasian colonies, names may be erased from the Register on conviction for offences considered by the Board to render the persons unfit to remain thereon. Registration as a pharmaceutical chemist is granted after passing a preliminary examination in Latin, English, and arithmetic; serving a four years' apprenticeship; and passing a final examination in practical pharmacy, chemistry, and any other subject that may be prescribed. The conditions of registration as a chemist and druggist are that the individual shall have been engaged in business as owner or manager prior to the coming into operation of the Act. The certificates of the Pharmaceutical Society of Great Britain are received in lieu of the examination for registration as a pharmaceutical chemist. It is an offence under the Act for unregistered persons to make use of any title, term, or sign, which may be construed to mean that such person is registered as a pharmaceutical chemist, or chemist and druggist. Corporations and joint stock companies are permitted to carry on business under the management of a registered pharmaceutical chemist. Wholesale dealing is not affected by the Act, pharmaceutical chemists in business are exempt from jury service, and poison regulations are presumably relegated to a separate Poisons Act.

NEW ZEALAND.

In this colony there is a Board of Pharmacy consisting of a president and six other members, which is required to keep a register of pharmaceutical chemists, from which names may be erased on conviction of any offence under the Act passed in 1880. The requirements for registration are that candidates must have attained the age of twenty-one years and shall be examined in their knowledge of the Latin language, botany, materia medica, pharmaceutical and general chemistry, and such other subjects as may from time to time be determined by any bye-law. All registered medical practitioners are entitled to be registered as pharmaceutical chemists on application, as are also the possessors of certificates from the Pharmaceutical Society of Great Britain. Any person selling or offering for sale adulterated drugs is considered to have knowledge of the adulteration, unless he prove the contrary. Medical

practitioners and wholesale dealers are exempt from the provisions of the Act, and, in case of the death of a pharmaceutical chemist, his executors, etc., are allowed to carry on the business for twelve months if it be conducted by a registered person. All titles, names, or signs implying that a person is registered under the Act are protected under a penalty of five pounds. No restrictions upon the sale of drugs and poisons, or the dispensing of medical prescriptions are found in this Act, nor is the term "person" specifically defined as including a corporation.

CAPE OF GOOD HOPE.

Pharmacy in this colony is regulated under the Medical and Pharmacy Act, 1891. The Pharmacy Board consists of a president, secretary, and five other members, two of whom are nominated by the governor of the colony, one by the Colonial Medical Council, and three by the chemists and druggists of the colony. Registration as a chemist and druggist is granted on examination, but the certificates of the Pharmaceutical Societies of Great Britain and Ireland are accepted in lieu of examination.

INDIA.

There are no pharmacy laws in India to regulate the sale of medicines and poisons, or to prevent the sellers from being any but qualified persons. The shops are of various kinds, from those of the Europeans in the Presidency towns and chief hill stations down to the small druggist's stall in the bazaar in the "pettah." Some of the best pharmacies are not altogether restricted to the sale and dispensing of medicines, as they often partake of the character of a general store department, and almost every pharmacy has connected with it an aerated water manufactory. Many of the native shopkeepers of Madras trade under the name of a European firm, and some of the shops are owned by proprietors who know little about medicine, the manager being the responsible salesman.

A person who opens a shop for the business of a chemist and druggist is, as a rule, qualified by a certificate granted by the Medical College of Calcutta, Bombay, or Madras. The larger pharmacies are managed by assistants qualified at home, and the owner of a certificate from the Pharmaceutical Society is regarded with more confidence than one with only a local qualification. The certificate of a "chemist and druggist" is given in Madras to the student who attends full courses of instruction in materia medica, chemistry, practical chemistry, and practical pharmacy, in the Medical College. The fee for each course is Rs. 10, and the examination fee is Rs. 25. Students seldom fail to pass the final test after their regular attendance at the lectures. The examinations are not compulsory, in fact anyone may open a chemist's shop as long as he pays the usual trade and professional tax to the municipality.

The British Pharmacopoeia of 1885 is the standard medicine book throughout the country, and whatever drugs or preparations may be introduced in any future British or Imperial Pharmacopoeia, the eastern druggist will only have to order them out from his western wholesale house in the usual way. The retail chemist makes himself as few stock preparations as he can,

as he imports his tinctures and ointments direct from England or Germany. are very few wholesale druggists in India, besides the one or two firms each in Calcutta and Bombay. The Government Medical Stores Departments in the three Presidencies are the largest establishments for the conduct of practical pharmacy, and the preparations are supplied exclusively to the Government hospitals and dispensaries. The prices for medicines are high, the reasons assigned for this being the freightage, breakage, and depreciation of the rupee. Proprietary medicines are very popular; they are well advertised in all the newspapers, and there is scarcely a house where some well-known pill or ointment is not used. In some large native towns, like Delhi, a native surgeon is connected with the druggist's establishment, and to all appearance this is a profitable combination of talent. In every Indian town there is a resident medical officer who writes his prescriptions and sends them to be dispensed at the chemist's, just as he would in England, and considering that many of these prescriptions are filled by native compounders, it is a matter of great satisfaction that mistakes are very seldom heard of.

HONG KONG.

The crown colony of Hong Kong is the most easterly of the British possessions, and the city of Victoria contains 250,000 inhabitants, of whom about 3000 are European residents. There are two English pharmacies in Victoria, besides one German and one Portuguese. A large amount of dispensing is done, for none of the doctors do any dispensing themselves, and a great many foreign prescriptions are presented including a large number of American ones, for at certain seasons visitors are constantly passing through the colony. As might be expected in such a malarious locality, large quantities of quinine, antipyrine, and phenacetin are used, as well as extract of malt and cod liver oil. Native assistants in the European "hongs" get from \$10-15 a month; European assistants are paid from \$80-130 a month for engagements lasting from 3 to 5 years. Lodging is generally provided, but not board, which, if a mess can be formed, costs from \$30-60 a month. Business practically begins at 7 a.m. and finishes at 7 p.m., but on certain days these hours are much shortened. The usual price for a bottle of medicine or a box of pills is a dollar. There is no poison law proper in Hong Kong, and anyone can buy the most dangerous drugs, such as datura, gelsemium, arsenic, etc., at any of the native drug stores for the mere asking.

JAMAICA.

The sale of drugs and poisons in Jamaica is regulated by the Law of 1894, the term "drugs" there including "medicine, compound medicine, or medicinal preparation," whilst "poison" includes "any poisonous substance, poisonous drug, or preparation containing a poison" scheduled under the Law. Parts 1 and 2 of Schedule A correspond with those of the British schedule, but are more extensive in each case, carbolic, pyrogallic, and mineral acids and many other substances not scheduled here being included. The conditions under which poisons may be dis-

pensed or sold are very similar to those prevailing in this country, but every sale of poison must be recorded in "The Sale of Poisons Book." Unwholesome or adulterated medicines must not be sold, or heavy penalties are incurred.

The pharmacies are run on very much the same lines as the drug stores in America, and are all fitted with American aerated water fountains, placed in some conspicuous part of the store. The proprietor deals in all the articles a grocer would in England, and keeps a large staff of hands for that purpose, at least so far as the Kingston shops are concerned. The amount of dispensing done is very small indeed, as all the Kingston medical men do their own dispensing, some of the busiest of the doctors having three or four men dispensing for them all day. It is very doubtful whether more than one in twenty of these men are properly qualified under the Jamaica Law, yet it is through them the great bulk of medicine finds its way into the hands of the public.

There is no preliminary examination, but candidates for a licence under the Law must submit certificates of moral character and respectability, and of general education. The qualifying examination itself consists of questions in elementary Latin, the recognition of drugs and chemicals at sight, a general examination on the Pharmacopoeia, and the dispensing of prescriptions. Candidates must have attained the age of twenty-one years, and have been engaged in the practice of pharmacy for two years, the last of which must have been with a registered medical practitioner or a licensed dispenser. Pharmacies must not be kept without a licensed person in charge and, in consideration of this, exemption from jury service is granted. In addition to the specific penalties for the various offences under the Law, conviction in any case may be followed by the suspension of the licence for a period not exceeding six calendar months.

DEMERARA.

At present there are no restrictions whatever under which pharmacy is conducted in Demerara, nor are there any regulations as to the qualification of those practising pharmacy, so that the most illiterate Chinese or the most ignorant of Africa's sable sons can become "chemists and druggists," and keep open shops for retailing or dispensing medicines to their fellow-creatures, merely by paying for the necessary licence. Certificates of any kind are of no moment whatever. The chemists and druggists have formed an association which has, amongst other things, endeavoured to get a law passed preventing anyone selling medicines unless he has been engaged by a chemist for a certain time, and has passed an examination held by the Association, but, so far, unsuccessfully, as there has been great opposition from the Medical Council, which claims that it and it only has any right to issue such certificates. Not only is there no protection whatever for chemists and druggists, but they suffer under unfair restrictions, as may be judged from the fact that within recent years a law was introduced by a Government official and passed by the Legislative Council, prohibiting chemists and druggists, under

penalty, from retailing a single grain either of opium or "ganjah" unless prescribed by a medical man, but giving free scope to any other man—no matter what his profession may be—to sell it *ad libitum*. There are several first-class pharmacies in Demerara, and chemists as a body are very much respected by the people, and there is all the more reason therefore why the Legislative Council should help them to become an organised body with their own laws, so as to protect the people from the effects of ignorance on the part of unqualified individuals.

TRINIDAD.

Druggists are admitted to practise their trade in Trinidad on the licence of the Medical Board, which consists of all the qualified medical men practising in the island, and is governed by a Council elected for three years, consisting of president, vice-president, secretary and treasurer, and three other members. The licence of this Board is granted to any person possessing a certificate entitling him to practise as a chemist and druggist or as an apothecary in any part of the United Kingdom, on proof that he is the person represented in the certificate. Druggists and assistant druggists are admitted to practise under a licence granted after a local examination held under the auspices of the Medical Board. The local "Sale of Poisons Act" is similar in its conditions to that of the United Kingdom.

There are very few medical men who compound their own medicines, or who keep a dispenser, and the patients' friends choose their own druggist from among those practising. American and French preparations and proprietary medicines have a large sale. English goods are not pushed to the same extent as American. Prescriptions are charged for at rates ranging from 2s. to 4s. each.

BERMUDA.

In Bermuda anyone can use the name of pharmaceutical chemist if he chooses to do so. Poisonous nostrums, including all sorts of vermin killers, are mixed up indiscriminately with sweets, etc., in other shops than that of the druggist.

The druggists are socially classed among the small shopkeepers, not having undergone any special training other than that of buying and selling.

It is compulsory that professional men, including the medical men and the dentists, shall, before practising, show that they have the necessary training by producing diplomas from recognised bodies, but no proof of ability is required by the man who dispenses their prescriptions.

ITALY.

The position of pharmacy in Italy just now is a peculiar one. The latest law allows every qualified pharmacist the right to open a pharmacy, but it also allows those already established the right to proceed against new-comers for an indemnity for the damage done to their business. When a new man opens a pharmacy the existing pharmacists who think themselves injured protest; a commission is then formed of high sanitary officials of the province, generally assisted by a doctor, and this commission decides the amount to be paid to the several protestors. Strange to say,

none but protestors get indemnified; if a man lives next door to the new-comer he gets nothing if he does not protest, but of course he invariably does so. The time taken by the commissioners to decide varies, according to their fancy, from three months to three years, and is usually nearer the latter. It is obvious from the above that the Italian Government wishes the pharmacists to be free, but does not wish to buy out existing interests, so the new-comers have to take the burden on their own shoulders. The removal of restrictions as to the number of pharmacies is already bearing bad fruit, for "cutting" is beginning. An official tariff is published of the retail price of all medicines known to the direct descendants of the Latins, and, though one may charge less than the stated prices, one cannot charge more. Many are now charging less, and further ill effects may follow.

GERMANY AND AUSTRO-HUNGARY.

Throughout Germany, Austria, and Hungary the practice of pharmacy has been from time immemorial subjected to stringent regulation by the governing authorities. In the interests of the public, qualification by study, technical training, and examination has been required, the mode of conducting business has been controlled by periodical inspections, and the charges for medicine, etc., have been regulated by a fixed tariff. The interests of pharmacists have also been protected by the limitation of the number of pharmacies in proportion to the population by restricting to them the dispensing of medicine and the sale of drugs or medicinal preparations, and by the prohibition of secret remedies. Under these conditions the occupation of the "apotheker" was largely of a professional character, and he held a position analogous to that of medical men or members of other professions. Of late years, however, the growth of the more purely trading portion of the business has been disproportionately rapid, the establishment of factories where pharmaceutical preparations are manufactured on a large scale, and supplied at a lower cost than they can be made for on a small scale, the introduction of specialties and their recommendation to the public by means of advertisement, have, together with other antagonistic influences, effected a great change in the conditions under which the practice of pharmacy is carried on in these countries. In that respect the situation is approximating to that which prevails in this country, and the trading side of the business is becoming more prominent. In many instances, however, this part of the business is kept strictly separate from the work of dispensing, to which a distinct apartment is allotted, entirely away from that in which retail trade and the sale of druggists' sundries is conducted.

FRANCE AND BELGIUM.

An attack is threatened upon the position of French pharmacists, the *Congrès des Sociétés de Secours Mutuels* having decided to seek to obtain powers to establish pharmacies for the supply of medicines to the members of the societies. Such pharmacies have been in operation in Belgium since 1882 and have

been found to attract considerable custom from the general public, in addition to those for whose special benefit they were ostensibly founded. In self-defence the pharmacists of Brussels, the place chiefly affected, formed last year a pharmaceutical federation of individuals keeping open shop exclusively, its objects being to counteract the effect produced by the so-called "popular pharmacies," and to defend pharmacists' professional interests generally. A special tariff was drawn up by the federation, but proved a failure. Then, however, numerous other societies not affiliated to the Belgian *Fédération des Sociétés de Secours Mutuels*, applied for a similar privilege with regard to the establishment of pharmacies, but this attempt the committee of the pharmaceutical federation was able to defeat just before the latest dissolution of the Belgian Parliament. It is anticipated that a fresh attempt will be made in the same direction, and, meanwhile, the pharmacists are resting on their victory, having also achieved the useful result of combining themselves into a compact body. It is now proposed, according to the *Moniteur de la Pharmacie*, to take similar action in France, and perhaps prevent the threatened evil at the outset, by founding a *Fédération Générale des Pharmaciens Français*, which shall occupy itself solely with the defence of professional interests.

UNITED STATES.

Of the forty odd pharmacy laws on the Statute Books of as many States of the Union, twenty recognise diplomas of colleges of pharmacy; fifteen recognise both medical and pharmaceutical diplomas. In these States, British certificates are more or less recognised for registration. In five of the most populous States—Massachusetts, New York, Pennsylvania, Ohio, and Illinois—no diplomas are recognised, examination by the Board of Pharmacy being the requirement for registration, except a provisional registration in Illinois after five years' experience in pharmacy. The pharmacy laws have protected the public against incompetent dispensing, have afforded medical men fair qualification in the compounding of prescriptions, but have reduced the pharmacists to practically the same level before the law, the public, and the medical profession, so that there is no further incentive for a young man to extend his studies in pharmacy beyond the meagre modicum required by the various Board Examinations, which is but little higher to-day than ten to fifteen years ago, when the first laws were enacted. In the State of Ohio there are no less than seven schools, and the condition of affairs is somewhat similar in other States. The students usually go to the college where they can get through the quickest. The "diploma mills" are therefore largely patronised. Pharmacy must, of necessity, undergo a radical change in the States, and it has already entered upon the starving-out period. Eventually all the States ought to insist upon registration of apprentices; two classes of establishments—drug stores and official pharmacies; registered assistants; registered pharmacists, who may "run a drug store"; registered pharmaceutical chemists to conduct official pharmacies.

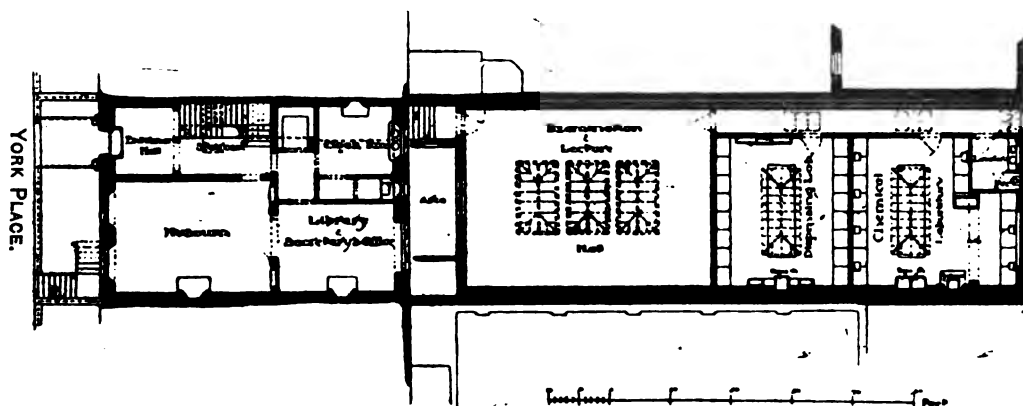
THE PHARMACEUTICAL SOCIETY'S New Hall and Laboratories in Edinburgh.

The extension of the Pharmaceutical Society's premises in Edinburgh has been rendered necessary by the increase in the number of candidates presenting themselves for Examination before the Board of Examiners for Scotland, and by the improved and extended system of practical and oral examinations. The present Hall was also found inconvenient and unsuitable for meetings when well attended.

A re-adjustment of the old premises is contemplated after the new are finished. The present Board Room will be the Library, and the ground floor entirely reserved for the Museum. The present Laboratory will be the Business Room and Office.

The additions have taken the form of a one-storeyed building, covering the entire background of the tenement, which was in 1884 acquired by the Society and converted for its uses. They comprise a Hall,

space between the side boundary walls. Its height to the ceiling is 16 feet. The wall surfaces are unbroken to the height of the frieze, but to a height of four feet they are tastefully panelled in wood. The ceiling is of plaster, and is relieved by having the constructive beams of the roof defined. The compartments so formed are panelled and moulded, the whole descending upon the cornice in cove form. Carved scroll trusses spaced in the frieze receive the ends of the beams. The lighting is from the top. Three of the ceiling compartments are filled with obscured glass, which receive the light from a like number of skylights in the roof above. By the inner glass frames cold draughts from the skylights will be checked. For artificial lighting, in the Hall and throughout the new buildings provision has been made for electric appliances, which it is expected will, at an early date, be available, but meanwhile large sunlight burners have been introduced. These are likewise constructed to exhaust the vitiated air



PLAN OF THE PHARMACEUTICAL SOCIETY'S PREMISES IN EDINBURGH.

Dispensing Laboratory, and Chemical Laboratory, also lavatory and cloak-room accommodation for students.

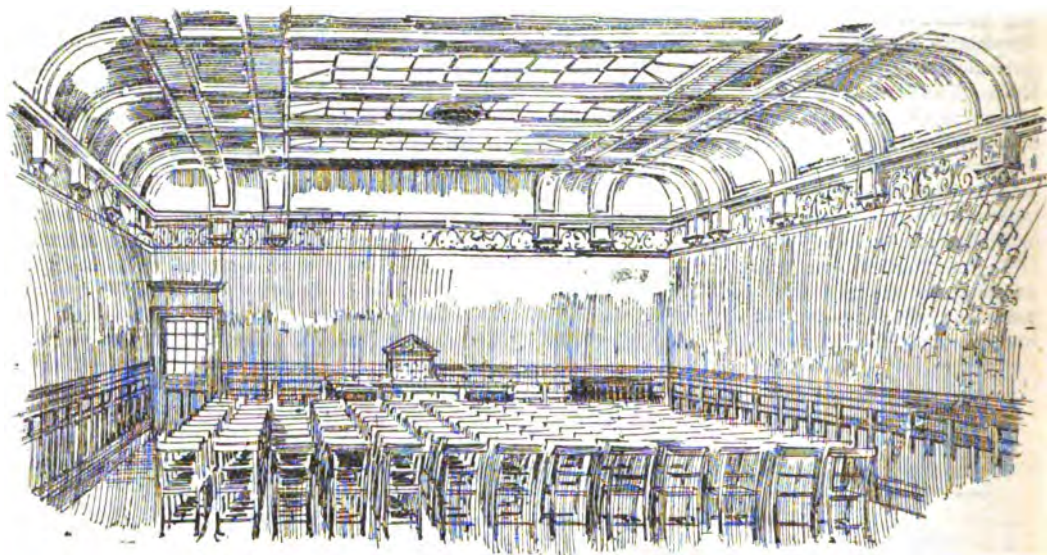
The approach is by an easy stairway descending from the ground floor of the existing premises of the Society, which are entered from York Place.

The stairway is well lighted and decorated to a height of five feet, with a coloured tile dado. The caretaker's apartments, and the ladies' lavatory are entered from a landing half-way down this staircase. Between the main building and the new hall is a shallow well, faced all round with white enamelled bricks. This affords light and easy ventilation to both buildings. In addition to the front entrance, there is an entrance by Duke Street Lane for the convenience of students, entering direct to the Chemical Laboratory and Dispensing Laboratory. This entrance is 16 feet below the level of York Place, and as there are Feu Charter restrictions against raising the roof of the Hall above a certain level, the lowering of the floors has been greatly in favour of the Hall, in securing for it a comfortable height of ceiling. The Hall is first reached from the staircase. It is an elegant apartment about 40 feet long and about 29 feet in width, thus filling the

by promoting an upward current. Fresh air is admitted from special inlet openings under control. For convenience of arrangement, light chairs instead of forms have been provided for seating, the accommodation being equal to 250 persons, after allowing ample space for the chairman's platform at one end. The Hall is very appropriately and tastefully decorated. The walls are papered with richly-coloured design paper, the ceiling is picked out in soft, light colours, and the frieze enriched with hand-painted ornament of suitable design. The woodwork is richly stained and varnished, the effect throughout being light, finished in appearance, and comfortable. The Hall is well heated by means of hot water radiators, with controlling taps to shut them off separately if desired. At the further end of the Hall a door leads to the corridor at the back, which communicates with the Dispensing Laboratory and the Chemical Laboratory. The Dispensing Laboratory is reached first. It is a large rectangular apartment, lofty, and well lighted. The appointments are most complete, and everything is of the newest style. Accommodation is provided for twenty-four students, each having a liberal allowance of counter space. Within the

counter, in a series of compartments, each student has all the requisites for dispensary work, and above the counter there are ranges of graduated shelving for bottles. Special chemical fume chambers are constructed in the main walls, where exhaust tubes of suitable altitude are situated.

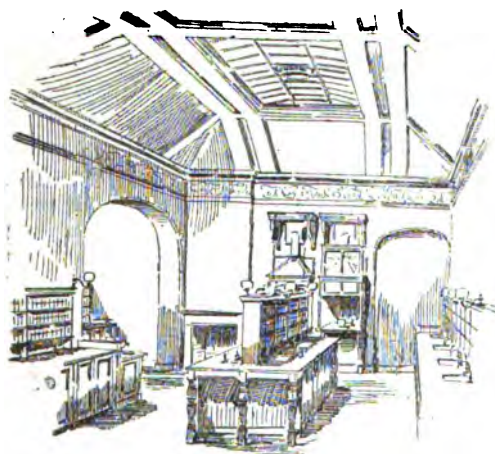
the main Hall, namely because of the surroundings of the building, the lighting is from the ceiling, but, as in the Hall, double sashes are provided to prevent air currents and maintain a more uniform temperature. The only exposed elevation of the new buildings is that towards Duke Street Lane. It is treated appro-



THE NEW EXAMINATION HALL.

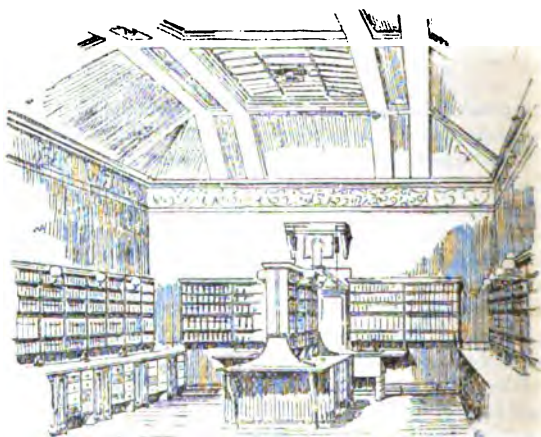
The Chemical Laboratory is of irregular outline on the plan, following an L shape—a small room appropriated as a gentlemen's lavatory occupying the re-entering angle. Accommodation is found for twenty-four students, who have each sink, cupboard, and bottle-shelving, with all modern appliances for carrying out

privately with simple detail of the Renaissance period. The drainage works have received special consideration, the system for the chemical working being in specially constructed pipes, and quite separate from the system for the ordinary requirements of the building.



THE DISPENSING LABORATORY.

the requirements of examination work. General cleansing sinks, chemical fume chambers, and other requisites are provided for in the most liberal manner. In this room is the stove for the general heating system by radiators, already referred to. Like the main Hall, the internal construction of the Laboratories is carried out with panelled ceiling, but on a much simpler scale. For the same reason as applies to



THE CHEMICAL LABORATORY.

The mason work has been executed by the late Mr Hugh Macintosh, the carpenter work and fittings by Messrs. John Davidson & Co., the plumber work by Messrs. Barton & Sons, the electric light fittings by Mr. Matthew Buchan, and the painting by Mr. R. G. Ross.

The architect for the work is Mr. Hippolyte Blanc, A.R.S.A., Edinburgh.

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Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

THE PRESIDENT IN GLASGOW.

MR. CARTEIGHE on Wednesday night delivered an important address to a large meeting of Glasgow chemists held under the auspices of the local Pharmaceutical Association, in the Religious Institution Rooms, Buchanan Street.

In the unavoidable absence of Mr. CURRIE, the President of the Association, the chair was taken by the Vice-President, Mr. FOSTER, who, in the name of the Association, gave Mr. CARTEIGHE, who was accompanied by his wife and Mr. BREMRIDGE, a hearty welcome to Glasgow. Mr. CARTEIGHE gave a short sketch of the history of pharmacy legislation, pointing out that, in his view, the chief defects of the present Act were—the absence of necessity for adequate training in the case of persons entering the trade, and the want of provisions reserving to registered persons the exclusive right to dispense medicines. He also thought that persons who have passed the Minor examination, should be members of the Pharmaceutical Society, entitled to the full privileges of membership, and that power should be obtained to delete from the Register any person guilty of misconduct.

The PRESIDENT then dealt with several suggestions made by Mr. CURRIE, and pointed out the difficulty of dealing with company trading in Parliament so long as the Widows Clause of the 1868 Act remains part of the law. Notwithstanding the evil inflicted by bogus companies on chemists and druggists, he was afraid that at the present moment the wish of the trade at large was that the Widows Clause should be retained. In view of that feeling he felt it to be almost impossible for the Society to go to Parliament for any change of the law in regard to companies; but whatever changes were desirable—and he mentioned a good many—the Council of the Pharmaceutical Society

must have at its back a majority of at least two-thirds of the trade before there could be any hope of success in the House of Commons.

On the motion of Mr. ROBINSON, one of the Vice-Presidents, seconded by Mr. BOYD, three cheers were given for Mr. CARTEIGHE, Mrs. CARTEIGHE, and Mr. BREMRIDGE.

A full report of the meeting will appear in next week's Journal.

THE REMUNERATION OF THE PHARMACIST.

Of all the questions directly affecting pharmacists there is none of more perennial interest or of more pressing importance than that concerning the manner and extent of the remuneration to which they are entitled for the services rendered by them to the public. It may, moreover, be asserted with confidence that there is no problem which is less likely to be solved to the general satisfaction. For, after all, in the absence of any legally established tariff of charges, it is peculiarly a matter for each individual to settle for himself what remuneration he will accept. Combinations to maintain any particular standard of prices must, in the very nature of things, fail to be effective except within extremely limited areas. In every trade or profession the same rule holds good; the remuneration depends primarily upon the individual receiving it, and in some degree upon the class of business carried on, as well as the district or class of people catered for.

The chief factor in the problem is, of course, the individual most directly interested in the results, for he is able to a considerable extent to influence the other factors by deciding where and how he will carry on business, as well as what kind of business it shall be. Even when his choice is not so free, it must always be within his power to modify his surroundings by his personal influence, the extent of the modification depending upon his business aptitude and previous training. Then, although, as already remarked, it will always be difficult to maintain any general standard of remuneration, this difficulty should not be permitted to interfere with the maintenance of a definite minimum charge, which must never be an unprofitable one. The pharmacist's charges should be classed under three distinct heads:—The highest remuneration for purely professional work, such as dispensing and analysis; the next for semi-professional work, such as the supply of chemicals and drugs which he personally guarantees; and the lowest for purely trading operations, such as are involved in the sale of articles which he simply hands over in the same condition as he receives them. This arrangement is the only rational one for the pharmacist to adopt, and, if faithfully adhered to, would enable him to avoid doing anything likely to conflict with the interests of his fellow-craftsmen.

But this question of remuneration does not affect pharmacists established in business directly only ; it affects them indirectly in its bearing upon those whom they employ. There is little reason to doubt that if every registered individual not in business on his own account were assured of more satisfactory remuneration and generous treatment generally at the hands of *bond fide* proprietors of pharmacies, considerable advance would be made towards the great difficulty of company-trading being overcome. As clearly stated in the excellent address recently delivered by Mr. SUTHERLAND (*ante*, p. 426), pharmacists generally must be prepared to offer to their assistants better terms than have been customary. This they ought to do if they respect and would maintain the status of their profession, for very decency's sake no less than in their own interest. There is no reason why, under greatly improved conditions, many assistants should not be content, as in other walks of life, to remain more or less permanently in that position. There are none too many legally qualified assistants in the country, and one very beneficial result of such a change as suggested would be to check the tendency to rush prematurely into business, and so relieve the overcrowding that is at the present time sadly too manifest.

ANTITOXINS.

THE more recent issues of the medical journals contain reports of further cases of diphtheria treated with antitoxin. In some it is expressly stated that the diphtheria bacillus has been found in cultures, but in many instances this has not been practicable. Where the characteristic membranes, glandular swellings, albuminuria, and depression are met with, that is, in pronounced cases, there can be, in the hands of competent medical men, no need for bacteriological diagnosis ; but where the signs are less well marked there is a possibility of mistakes, and, according to the view we have already expressed, we hope that in our London hospitals the bacteriological test will in future be applied. The method of doing this is not difficult, and the diagnosis of the bacillus in cultures is easy on account of the rapidity of growth which the diphtheria bacillus shows at suitable temperatures and in suitable media. A sterilised platinum needle is rubbed on the suspected membrane, and plunged in the usual way into a jelly made with peptone-bouillon and agar-agar ; to this 5 per cent. of glycerin is added. Sheep's or bullock's serum, fixed at 70° C., serves equally well. At a temperature of 37° C. in these media, small white colonies begin to develop on the surface and in the needle track so rapidly, that they are visible in twelve hours, and in fifteen hours are sufficiently advanced

to afford material for cover-glass preparations, which should be stained with methyl blue dissolved either in 5 per cent. carbolic acid solution or in '01 per cent. solution of caustic potash.

In order to summarise the more recent experiences with antitoxin treatment, we have consulted the London medical journals, to which we are indebted for what follows :—

It seems right to notice German results first, seeing that BEHRING crowned the work of LÖFFLER and ROUX by the discovery of the antitoxin. Many of the German hospitals have published hopeful statistics, and the antitoxins prepared either under the supervision of Professor BEHRING or made according to his directions by ARONSON have been largely used outside Germany ; for instance, Professor BOKAI publishes the results of thirty-five cases treated by Professor BEHRING's serum, and resulting in five deaths. Of the thirty children who recovered, intubation of the larynx was performed in twelve. Twenty of the cases were under four years and seven under two. Thus the result must be regarded as exceptionally good considering the age of the children. We may note in passing that in two of the cases no growth of bacilli was obtained, although all the clinical characters of the disease were present. Thus it seems the bacteriological test should not be relied on by itself.

In Germany polemical articles have already appeared in the magazines, Professor BEHRING upholding the virtues of the method, whilst Professor ROSENBACH, on the one hand, and Drs. GOTTSTEIN and SCHLEICH, on the other, criticise the method and the published statistics adversely. It is noteworthy, too, that LÖFFLER has recently insisted on the importance of local antiseptics in diphtheria.

In France the record made by M. ROUX of two hundred cases treated with serum prepared by him is chiefly relied on. It is to be noted that all the ordinary measures are equally insisted on, whether the antitoxin treatment is used or not. In Paris, it seems, cases of diphtheria not treated with antitoxin show the high mortality of 50 per cent., and in the two hundred cases in which antitoxin was used the mortality was 24 per cent. To make these figures more instructive it is advisable to add that in cases where tracheotomy was necessary the percentage of deaths was 73·19 per cent. without antitoxin, and 49 per cent. when the antitoxin was used.

In England ARONSON's antitoxin has been chiefly employed. Many medical men have sent, with admirable impartiality, reports both of recovery and of death in cases in which antitoxin was administered. Mr. SAW, house physician at St. Mary's Hospital, has published a series of five cases in which antitoxin was used, and all of which

required tracheotomy. All these patients, young children, recovered. We understand that since the supply of antitoxin failed several deaths have occurred at the same hospital in cases of diphtheria in children. At St. Bartholomew's Hospital good results have also been obtained. We are glad to see that antitoxin, prepared at the Institute of Preventive Medicine under the supervision of Dr. RUFFER, has already been applied therapeutically, as in the following instance reported by Dr. FRITH (Woolston):—A child, age eleven, presented unmistakable evidence of the disease. The tonsils and uvula were covered with membrane. 5 C.c. of antitoxic serum were injected. The strength of the serum had previously been tested by Dr. WRIGHT, of Netley, by injecting into guinea-pigs measured quantities of toxalbumin with the antitoxin, and it was thus found that '001 C.c. of this serum neutralised 1 C.c. of the toxin. The remedy in Dr. FRITH's case appeared to have a good effect; within a few hours the patient's general condition improved considerably, and recovery was rapid.

It must be said that a review of the cases published in this country is most distinctly in favour of the method. With regard to the antitoxin of tetanus, the prospect is not so hopeful.

Dr. C. E. DOUGLAS relates a case of tetanus in which, in conjunction with salicylate of eserine ($\frac{1}{16}$ gr.) and 20 gr. doses of chloral hydrate, TIZZONI's antitoxic serum was used. A gardener, aged sixty-three, had been bitten by a dog, and five days later, when the wound had healed, stiffness of the jaw was observed. Four days after this, pain and rigidity in the muscles of the abdomen and back came on. The symptoms became daily worse, severe spasms with opisthotonos supervening. Quarter-grain doses of morphine were added to the treatment. On the seventh day after the onset of treatment "half a tube" of TIZZONI's dried serum was dissolved in water and injected by seven punctures into the muscles of the thigh and back, strict antiseptics being employed. In spite of stimulants the man died the same day. This case may be taken as one of many which go to show that the antitoxin of tetanus is quite useless except when employed at the commencement of the disease. Dr. DOUGLAS mentions a point of practical importance, namely, that dried serum dissolves very slowly in cold water. The directions given for use of the antitoxin state that the substance "decomposes under a temperature even a little elevated." Dr. DOUGLAS suggests that since the normal temperature of the horse is about 101° F., water at 100° F. would probably not injure the antitoxin and would dissolve the antitoxin serum much more readily than cold water. It is to be hoped that the antitoxic serum for tetanus will

shortly be produced from an English source, so that the remedy may be tried earlier in the disease, and thus, before judgment is finally pronounced, this antitoxin would have a fair trial in this country, although not so much is to be hoped from it as in the case of the antitoxin of diphtheria. Indeed, it has been said that as soon as the first symptom of tetanus is present the time for preventive treatment has passed. If so, preventive measures for tetanus must be limited to antiseptics. In many cases of lacerated wounds dirt is, however, forced into the tissues, and antiseptics is impossible unless immediate amputation is performed. As an alternative to this a farther trial of the antitoxin of tetanus, which, in experiments on animals, has been found to work so well, is emphatically called for.

THE REVISION OF THE PHARMACOPŒIA.

THAT the forthcoming issue of the British Pharmacopœia should be as comprehensive as possible, and include such remedies as have been proved to be universally useful, is a proposition which must commend itself to everyone capable of forming an opinion on the subject. But, considering the knowledge we at present possess, it is not by any means so self-evident that the time has arrived for the production of a pharmacopœia which would be "imperial" in the sense of being equally adapted to the requirements of every part of the British empire. There are so many difficulties to be overcome, that the result, if that task be undertaken, is almost sure to bring about disaster, or at least confusion, a most undesirable element in such an important publication.

The important factor of climatic conditions alone raises a barrier which will be found very difficult to surmount, for in the case of ointments, for instance, formulæ which may be most suitable for the colder regions of Great Britain would probably be wholly unsuitable for a climate like that of India or the northern parts of Australia. But even leaving out of account this and any minor difficulties which may suggest themselves, it is necessary to consider the more important question whether we really know sufficient about the various colonial productions, the use of which for medicinal purposes has up to the present been advocated by our colonial friends. Certainly much yet remains to be found out. We would be sorry to write anything to disparage the earnest and patient researches of colonial scientists, for the time has arrived when their labours are beginning to bring forth important results, and the powers that be will do well to consider carefully the various valuable suggestions that are to hand from colonial centres in connection with the new edition of the Pharmacopœia.

We are well aware that in the Australian colony

of Victoria a great deal of both Government and private money has been spent in the growing of opium, the production of essential oils, and various medicinal plants, and that the medical faculty of that colony may be said to unanimously approve the colonial grown articles. Therefore, it appears fair and reasonable that in such cases as these the use of local productions for medicinal purposes should be officially recognised so far as the interested colony is immediately concerned. But cannot all this be amply provided for by supplementing the matter of the *British Pharmacopoeia* with footnotes in reference to particular official drugs or preparations, and with an appendix including the more valuable unofficial productions? This appears to be all that is practicable or that can be desired, and it would be a great step in advance towards the future. That in this sense the "imperial" adaptation of the national pharmacopoeia may become an accomplished fact in the future is quite within the range of possibilities; but to fulfil the requirements of all conditions it must be a thing of slow and sure growth, for it is too large and important a subject to admit of hasty compilation. From the very nature of the book it must continue in the future, as in the past, to be a work in which changes will always be more or less required, and the information it contains must of necessity be at most, comparatively speaking, complete only up to the date of its publication.

The general impression given by the majority of the communications we have received on this subject is that the prevailing notions with regard to the next revision of the *British Pharmacopoeia* are extremely vague and indefinite. We are pleased, therefore, to be able to publish the reference to the matter made by the President of the General Medical Council, Sir RICHARD QUAIN, Bart., in his address at the opening of the fifty-seventh session on Tuesday last. It will be noticed that a full statement concerning the various communications received from the colonies, etc., will shortly be submitted to the Pharmacopoeia Committee by Professor ATTFIELD, and the details of this statement we hope to be able to publish in our next issue.

"ANTITOXIN" AND "ANTITOXINE."

In reference to the application of the term "antitoxin" to the prepared serum used in the treatment of diphtheria, we learn from the proprietor of an article designated "antitoxine" that he claims priority in the use of this word, and that he had registered it as a trade mark in the United States so far back as October, 1892. It must, however, be stated that, before the time mentioned, the term "antitoxin" was in general use by bacteriologists in relation to the production of immunity.

PROPRIETARY MEDICINES IN FRANCE.

THE proposed alteration of the French law relating to foreign proprietary medicines, according to which the statement of the active principle and dose on the label is to be required as the only condition of their sale, is calculated to have an important influence upon the trade in such articles, and, as pointed out by JUNGFLERSCH, to facilitate their sale to the disadvantage of French pharmacy. Under the existing law no medicinal preparation, considered by the authorities to be of a secret nature, is allowed to be imported or sold. Any question requiring to be determined in regard to such articles is submitted to investigation in the laboratory of the *Ecole Supérieure de Pharmacie* for the information of the Minister of Commerce, and in that way foreign quack medicines are kept out of France.

AN INTERNATIONAL CHEMICAL CONGRESS.

It is suggested by the American Chemical Society that committees should be appointed by the various chemical societies in other countries, to consider the desirability and practicability of organising a series of international congresses, at which the chemists of various nations could regularly meet together for the discussion of subjects of common interest. The interest manifested in the International Chemical Congress held in connection with the Chicago Exposition, and the fact that, in addition to similar organisations in medicine and pharmacy, geologists have also established a triennial international congress, justify the anticipation that such periodical meetings of chemists may also be feasible. Those interested in the project are requested to communicate with F. W. CLARKE, U.S. Geological Survey, Washington, U.S.A.

AUGUST KAUFERT.

WITH profound regret we record the death, at the age of forty-seven, of AUGUST KAUFERT, one of the Burgomasters of Elberfeld, and a most active member of the German Apotheker Verein, who had for many years occupied the position of a member of the Vorstand, or executive, of that body. Herr KAUFERT will be remembered by several of our readers who have attended the meetings of the Apotheker Verein, and also as having been present on the occasion of the celebration of the jubilee of the Pharmaceutical Society in 1891.

SUBSCRIPTIONS TO THE JOURNAL.

FOR the convenience of those who do not receive the *Pharmaceutical Journal* regularly, and who desire to become subscribers, an order form is enclosed with the present number. The Journal is supplied from the Office, 5, Serle Street, Lincoln's Inn, London, W.C., post free to any address at home or abroad for twelve months, on receipt of 10s. 6d.

MISCELLANEOUS NOTES.

We are informed by the Society's Solicitors that a formal intimation has been received by them purporting that Mr. MANDALL will withdraw from contesting the petition of the Society for the revocation of the patent No. 6178 of 1893, described as for "A New and Improved Utilisation of Liquorice and other Ingredients for the manufacture of certain Medicinal Compounds."

A GRANT of one thousand pounds has been made by the Goldsmiths' Company for investigating the antitoxin treatment of diphtheria, and supplying anti-diphtheritic serum amongst the poorer classes of the community. The Laboratories Committee of the Royal Colleges of Physicians and Surgeons has undertaken the administration of the grant.

THE Naples correspondent of the *Daily News* states that the anti-diphtheritic serum received at Genoa from the BEHRING Institution has given very unfavourable results, the Genoese physicians being much disappointed. The Venetian doctors, also, are equally dissatisfied, many cases treated with the supposed remedy having resulted fatally.

THE Italian Government is said to have issued a decree offering prizes of £500, £350, and £175 sterling to persons who shall open factories for the preparation of citric and tartaric acids in Sicily. To obtain the first prize both citric and tartaric acid must be made, the former in a quantity of at least half a ton a day. Applications for the prizes must be made not later than December 31, 1895, and the works must be in operation not later than February, 1896, in which year the Minister of Agriculture will distribute the prizes.

A CO OPERATIVE society of pharmacists has been formed in France to manufacture iodine and its compounds, the supply of which will be strictly confined to the shareholders.

ACCORDING to the *Pharmaceutical Era*, the members of the class attending the Jefferson Medical College at Philadelphia, have decided when they graduate in 1897, to use the metric system in writing their prescriptions.

THE postal authorities announce that on and after January 1, post cards, book packets, newspapers, and sample packets will be re-directed free of charge, under the same conditions as letters. Parcels, however, will still be liable to additional charge for re-direction.

Mr. THOMAS BATESON, pharmaceutical chemist, Kendal, has been placed upon the Commission of the Peace for the borough of Kendal. Mr. BATESON is Vice-Chairman of the Kendal School Board, and has just been re-elected unopposed to the Town Council. He will be remembered also as a candidate for a seat on the Pharmaceutical Council in May last.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE EXECUTIVE OF THE NORTH BRITISH BRANCH.

A meeting of the Executive of the North British Branch was held in the Society's House, 36, York Place, Edinburgh, on Thursday, November 29, at 12 noon, Mr. Michael Cartelghe, President, in the chair.

Present, Messrs. Laidlaw Ewing, Currie, Davidson, Fisher, Gibson, Hardie, Henry, Johnston, Kermath, Kerr, Kinninmont, Lunan, McAdam, Nesbit, Strachan, and Sutherland.

The minutes of the last meeting were read and approved.

The Report of the General Purposes Committee, consisting of minutes of meetings held on October 9 and 16 and November 13, were read. From the report it appeared that a tender for heating new hall and laboratories by hot-water radiators for £50 15s. by Messrs. Mackenzie and Moncur, had been accepted; a tender by the York Glass Company for special recess labelled reagent bottles for Chemical Laboratory, at 18s. per dozen, was accepted, and it was resolved to procure recess labelled bottles, etc., for Dispensing Laboratory; a tender for chairs for hall at 4s. 6d. each by J. & T. Scott was accepted; a tender for painting hall and laboratories by Mr. Ross for £42 14s. 6d. was accepted; a tender for enamelled tile dado in staircase at £56 by Messrs. G. & H. Potts was accepted; also a tender of £57 for gas fittings in hall and laboratories by Messrs. Barton & Son, and a supplementary estimate to complete electric light fittings for £5 15s. by Mr. Buchan were accepted. It had also been arranged to suggest to the Council, and the Council had directed, that there should be an opening ceremony in the form of a reception and conversations on the evening of November 30. The Committee had also called a general meeting of the trade which agreed to have a dinner of Scottish pharmacists on the evening preceding the official opening of the new premises.

The report was unanimously adopted.

By request of the President, Mr. Laidlaw Ewing explained the progress made with the buildings and the arrangements for the official opening on the following night. The Executive then went into committee to consider the report of the Special Committee appointed to consider names for the Board of Examiners. On resuming it was reported that Professor Patrick Geddes, Dundee; Professor John Gibson, Edinburgh; and Messrs. Peter Boa, David Brown Dott, and Jonathan Innes Fraser, Edinburgh; James Jack, Arbroath; Thomas Maben, Hawick; and John William Sutherland, Dumfries, would be selected for appointment by the Council as members of the Board of Examiners for Scotland for the year 1895.

Votes of thanks to the retiring examiners, Messrs. Nesbit and Gibson, were carried by acclamation.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The fifth general meeting of the 45th session was held on Thursday, November 22, the President, Mr. J. J. Smith, in the chair.

A conversation followed a question by Mr. A. S. Buck respecting the effect of a moderate heat upon piperazin in making the compound granular.

The respective value of ointment of boric acid of different degrees of hardness, and of gelatin of zinc, and other preparations, were spoken of by Mr. C. Hanson, as applications to the face of a small-pox patient. The medical attendant had tried several, and had found a zinc gelatin most effectual.

Mr. T. H. Wardleworth contributed a highly interesting paper upon "Some Objects of Pharmaceutical Interest in the Liverpool Museum." By the courtesy of the curator of the museum the lecturer was able to illustrate his remarks by means of a large number of specimens which were lent for the occasion. Egyptian antiquities were first dealt with. Then, in the Assyrian section, it was shown that the treatment of diseases was of very ancient origin, and a prescription copied from a tablet which contained thirty-four ingredients, was read in English. Coming to the Roman section, many curious mortars were exhibited, which, from their uneven surfaces, had been well used, and had doubtless been employed in the preparation of medicines. A small hand-mill, used in the early eighteenth century for spices, etc., was also shown. Finally, poisoned darts and arrows claimed attention, including specimens from British Guiana, Bosjemen, Borneo, and Gaboon.

Mr. E. Cox followed, and dealt in a most interesting manner with the archaeology of Liverpool and neighbourhood.

Several of the points were freely discussed, and both essayists were commended in the highest terms, not only for the interesting character of their communications, but also for the ability with which the subjects had been placed before the members.

Parliamentary and Law Proceedings.

POISONING CASES AND INQUESTS.

POISONING BY LAUDANUM.

Thomas Henry Byard, aged 45, of Brearly Street, Leicester, died on Sunday, November 18, from the effects of laudanum, self-administered. Verdict: "Suicide whilst temporarily insane.—*Leicester Daily Post*."

SUPPOSED POISONING BY PRUSSIC ACID.

Dr. Thomas Joseph Redhead, of Hedon Road, Hull, died on Tuesday, November 20, presumably from the effects of prussic acid, self-administered.—*Yorkshire Daily Post*.

POISONING BY CARBOLIC ACID.

William Alcock, aged 14, died at Birmingham last week after taking carbolic. Verdict: "Suicide whilst suffering from emotional insanity." The jury expressed the opinion that carbolic acid should be scheduled as a poison.—*Daily Chronicle*.

POISONING BY A LINIMENT.

Isaac Moore, aged 89, died at Heaton on Sunday, November 11, from the effects of ammonia contained in a liniment which he drank inadvertently. Verdict: in "Death from senile debility, accelerated by drinking liniment."—*Nottingham Daily Express*.

Reviews and Notices of Books.

THE DISPENSATORY OF THE UNITED STATES OF AMERICA. Seventeenth Edition. Thoroughly revised and largely re-written, with illustrations. By H. C. WOOD, M.D., LL.D., JOSEPH P. REMINGTON PH.M., F.C.S., and S. P. SADTLER, PH.D., F.C.S. (Philadelphia: J. B. Lippincott Company, 1894.) Price \$7.00.

The editors of this work refer in their preface to several circumstances which have necessitated a more than ordinary revision of its contents. Among these, the alterations in the United States Pharmacopœia, amounting in some respects almost to a revolution, and the introduction of new remedies, have been the most important. The official adoption of the metric system of weights and measures, and of modern chemical and botanical nomenclature, has also occasioned corresponding changes in the Dispensatory.

But the general plan is still the same as in the earlier editions, the object being to present an account of medicinal substances in the state in which they are met with in trade, and to teach the modes in which they are prepared for use.

The work is therefore to be regarded as a commentary upon the Pharmacopœia of the United States and the British Pharmacopœia, with such preparations of the German Pharmacopœia and French Codex as are generally used in the United States. In the first part, occupying 1480 pages, all the remedies recognised by either of the two pharmacopœias used by English-speaking people are discussed. Part II. includes the national formulary issued by the American Pharmaceutical Association, and articles on non-official drugs and preparations. The section treating of drugs and medicines not official, extending over 238 pages, contains about one thousand additional separate articles, in which the information as to new drugs and chemicals, etc., requisite for practical purposes is condensed as far as possible. In Part III are considered the tests and test solutions of the two pharmacopœias, weights and measures, the art of prescribing medicines, and other cognate miscellaneous matters.

The glossary of terms used to define the action of remedies has been retained, and as the work is intended for use by medical men as well as pharmacists, an index of diseases is added, with statements of the corresponding remedies. This is placed at the commencement of the volume to avoid confusion with the general index.

In the main part of the work the alphabetical arrangement has been adhered to as most suitable for a book of reference of an encyclopædic character. To gain the space necessary for the insertion of new matter without unduly increasing the size of the volume, the size of the pages has been increased and the matter of the second part has been printed in smaller type.

Much labour has evidently been expended in bringing up to date the information relating to different drugs, and some of the data in the last edition of the pharmacopœia have been corrected, as, for instance, the statement that codeine does not act upon litmus paper.

The articles on vegetable materia medica are of very unequal merit. The article *Cinchona*, as might be expected from Professor H. H. Rusby, is carefully written, and bears the imprint of thorough knowledge of the subject, embodying the observations made by him in South America and the London drug market. Some of the shorter articles such as *Urtica* are brought quite up to date. Others have evidently passed the eye of the reviser of the proof-sheets with their mistakes unnoticed, thus *Aconitum lycoctonum* is said to "probably yield much of the aconite of commerce;" Saigon cinnamon is "derived from *Cinnamomum loureiroi*;" *Piper ribesoides* is written *P. fiberioides*; *Illicium majus* still appears as *I. 'magus'*, and no reference to either it or *I. griffithii* is made in the text, nor is the reader given to understand that the illustrations are borrowed from an article by Holmes in the *Pharm. Journ.* on Star Anise. Sagapenum is stated to be the produce of a "well known" Persian plant; the chemistry of cinnamon oils is by no means up to date, and the article needs re-writing in a future edition.

On the other hand, the majority of the articles show a careful discrimination and sifting of the varied and often contradictory statements by different authors, and an independent opinion that commands respect. Thus under *Coca* the author states that he believes there are only two sub-species or varieties, which he calls respectively *novo-granatense* and *bolivianum*. In following the U.S. Pharmacopœia the new methods of nomenclature of course effect some alterations, thus *Balsamodendron myrrha* becomes *Commiphora myrrha*. The nomenclature is, however, less up to date under the Cryptogams, thus *Agaricus muscarius* now reappears under its more accurate designation, *Amanita muscaria*, whilst *Agaricus atramentosus* and *A. rudis* still remain under their old names, and white agaric does not, as it should (either directly or by cross reference) appear under the heading of *Polyporus officinalis*. It is therefore difficult in some instances for the uninitiated to know what is the correct scientific name of the plant referred to. These are, however, minor points which serve to show, in a work covering such an immense extent of ground, how many difficulties have to be overcome in face of the ever-increasing tide of human knowledge.

THE NATIONAL DISPENSATORY. Containing the Natural History, Chemistry, Pharmacy, Actions, and Uses of Medicines, including those recognised in the Pharmacopœias of the United States, Great Britain, and Germany, with numerous references to the French Codex. By ALFRED STILLÉ, M.D., LL.D., JOHN M. MAISCHE, Ph.D., CHARLES CASPARI, Jr., Ph.G., and HENRY C. C. MAISCHE, Ph.G., Ph.D. Fifth Edition. Enlarged and revised in accordance with the Seventh Decennial Revision of the United States Pharmacopœia. With three hundred and twenty illustrations. London: J. and A. Churchill, New Burlington Street. 1894. Price 36s.

The popularity acquired by the 'National Dispensatory' on its publication fifteen years ago, as a work affording accurate and complete information for the

use of medical men and pharmacists, has been well maintained in subsequent editions by the revision of its contents, bringing it up to the level of the science and practice of the period. In the present edition the same plan has been followed, and although one of the chief editors died before its publication, his portion of the work had already been practically completed, with the assistance of Professor Caspari, of the Maryland College of Pharmacy. The therapeutical portion has been revised with equal thoroughness by Dr. Stillé. The alterations and additions are more extensive than in any previous edition, owing to the great changes which have been made in the United States Pharmacopœia, and considerable use has been made of information appearing in foreign pharmacopœias. Synthetic remedies and unofficial preparations now in use have been fully described. Chemical and pharmaceutical processes, as well as the formulæ for galenical preparations, have been discussed, and the most approved apparatus and tests have been fully described. Formulæ are given both in ordinary weights and measures and in their metric equivalents; many tables and lists are inserted for convenient reference, together with a therapeutical index of diseases and remedies; and a very copious general index, including together some twenty-five thousand references, and every element of utility has been provided for rendering the work even more valuable to physicians and pharmacists than it has hitherto been.

The arrangement of the matter is in chapters, placed in alphabetical order, and the whole of it, whether relating to official or unofficial drugs and preparations is included in one section, extending over 1737 pages, while the tables and lists of reagents, and tests of drugs and preparations official in the United States and British Pharmacopœias, are contained in an appendix.

WRIGHT'S IMPROVED PHYSICIANS', SURGEONS', AND CONSULTANTS' VISITING LIST, 1895. Compiled by ROBERT SIMPSON, L.R.C.P., L.R.C.S. Bristol: John Wright and Co. 6s. 6d.

The first edition of this list was described in the Journal for October 14, 1893, and the present one is very similar, except that, as the result of numerous suggestions, material improvements have been introduced. Thus, the paper has been slightly thickened; and there have been added two pockets, a cash column to each page, two cash leaves to each month, pages for vaccination engagements, a purse fastener, which will be found more readily handled than the old-fashioned tuck, and other minor additions. It is doubtful if a visiting list could be better arranged than this.

GRIFFIN'S CHEMICAL HANDICRAFT. Pp. 436. 2s. 6d. London: John J. Griffin & Sons, Ltd.

This is a new edition of the well-known illustrated and descriptive catalogue of chemical apparatus, the special feature of which is the detailed explanation given of special processes in which the apparatus is used, as well as of the construction of the apparatus itself. The needs of the modern chemist seem to be fully served, the most recent appliances being figured and described.

Notes and Queries.

ROUGE DU JAPON.

[783.] This preparation is a kind of lake, consisting of lead oxide coloured with eosine. It is prepared by electrolysing a 10 per cent. solution of sodium acetate with two lead electrodes. The eosine in solution is placed in the vessel in which electrolysis is proceeding, and is absorbed by the lead oxide as it is formed. The colour of the product can be varied by regulating the concentration of the eosine solution. By substituting rhodamine or other colouring agent for eosine, different colours can be obtained, and by using zinc instead of lead for the electrodes a preparation will result having zinc oxide as its basis. In like manner the sodium acetate may be replaced by sodium nitrate, or a mixture of that compound with ammonium nitrate (*Bull. de pharm. de Bordeaux*).

THERMOMETERS FOR HIGH TEMPERATURES.

[784.] To indicate temperatures above 250° C. thermometer tubes are filled with nitrogen under pressure, and temperatures up to 450° can then be recorded. M. Niehl, of Berlin, has also recommended the use of gaseous carbonic acid, by means of which he has recorded temperatures up to 550°. The tubes are made of Jena borosilicate glass, which does not soften below 600° (*Bull. de pharm. de Bordeaux*).

MISCIBLE EXTRACT OF COCA.

[785.] "I should be pleased to be informed of the best method of preparing a miscible extract of coca to mix with a slightly acid liquid. — PERU."

DETERMINATION OF MENTHOL.

[786.] Heat peppermint oil, 20 Gm., with alcoholic normal sodium hydrate solution, 30 C.c., for an hour in a flask with a reflex condenser. Well wash the saponified oil with water, and boil for an hour in a flask with a condensing tube, with an equal quantity of acetic anhydride and sodium acetate, 2 Gm. Cool the product, well wash with water, and then with a dilute solution of sodium hydrate; dry in contact with calcium chloride, and filter. Now saponify 8 to 10 Gm. of the resulting oil as above, using 50 C.c. of alcoholic normal sodium hydrate solution, and determine the uncombined alkali by titration. Each 1 C.c. of normal alkali required for saponification corresponds to 0.156 Gm. menthol, or 0.198 Gm. menthyl acetate. Therefore, to ascertain the percentage amount of menthol in the non-acetylated oil (free from ester), subtract from the quantity of oil used for saponification 0.042 (the difference between 0.156 Gm. and 0.198 Gm.) for each 1 C.c. of normal alkali consumed, and calculate the total percentage, P, of menthol by the following formula:—

$$P = \frac{a \times 15.6}{S - (a \times 0.042)}$$

where S-grammes of acetylated oil require for saponification a-cubic centimetres of normal alkali (*Schimmel's Bericht*).

Novel Appliances, Apparatus, etc.

NEW MENTHOL INHALER.

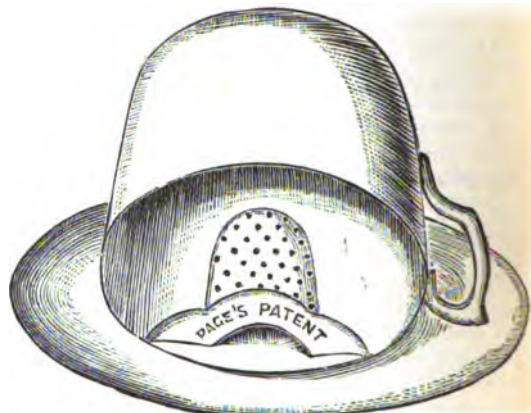
A convenient little inhaler for the mouth and nose has been introduced by Messrs. Godfrey & Cooke, Conduit Street, W., as a means of freely introducing the vapour of menthol into the respiratory tract, in hay fever, influenza, nasal catarrh, etc., and may be easily carried in the waistcoat pocket. It consists of a vulcanite tube, fitted with a solid rod of menthol. The narrow end of the tube is



placed in the mouth or nostril, as the case may be—a loose soft rubber cap being used in the latter instance, as represented in the illustration—and air is then drawn through the length of the tube, becoming impregnated with menthol in its passage. By carrying the inhaler in the waistcoat pocket it is kept at a temperature approaching the heat of the body, and the menthol then volatilises more readily.

PATENT PERCOLATING CUP.

This cup is made of china, and fitted with a kind of strainer under a mouth protector, thus forming at once an infusion pot and cup combined. The tea, senna, etc., is

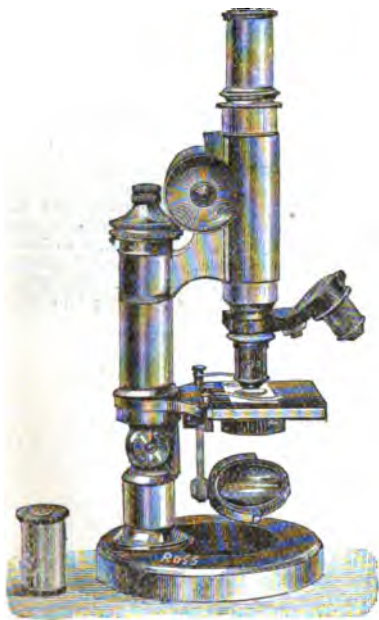


placed in the body of the cup, over which the saucer is made to fit compactly, forming a lid during the infusion, and the liquid is strained in the act of drinking, any sediment being retained in the cup. Various other obvious uses for the cup are suggested by the makers, Messrs. Page & Co., 52, Wharton Street, King's Cross Road, W.C.

NEW "ECLIPSE" MICROSCOPE.

The instrument illustrated is made by Messrs. Ross & Co. New Bond Street, W., and affords the greatest facilities for practical work, combined with stability and the necessary strength to withstand hard use. As shown in the illustration, it is mounted on a circular foot, the centre of gravity being so situated that equal steadiness is secured in every direction. The stage being firmly fixed to the strong upright pillar, is not liable to flexure, and the method of attachment of the limb carrying the sliding tube insures perfect steadiness of the optical combinations. The fine adjustment is very substantial, and being independent of set screws is not subject to derangement. Its fitting, by a new contrivance, is completely covered at all points, being thus preserved from disturbance or injury by dust. This microscope is furnished with two eye-pieces; 1" and ¼" object glasses of highest excellence

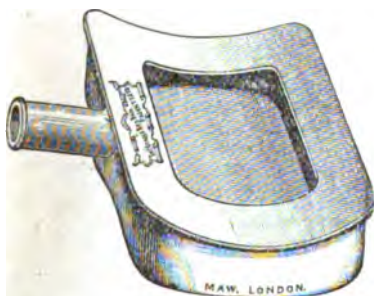
and large angular aperture, both adjusted to a double nose-piece, so that they focus in the same plane; swinging mirror and stage diaphragm, which is so arranged that



they need not be removed should a tube-fitting be attached to admit the use of a condenser. The whole of the apparatus packs into a compact mahogany case.

MISCELLANEOUS NOVELTIES.

The use of aluminium is extending rapidly now that the price of the metal has been reduced, and Messrs. Maw, Son & Thompson, of Aldersgate Street, E.C., are making a special feature of its applications for pharmaceutical purposes. Thus, they are supplying sets of grain and drachm weights in aluminium, which possess manifest advantages over brass ones. Besides being comparatively untarnishable, they are about double the size of the corresponding brass weights, and accordingly much more convenient to handle. They are also very plainly stamped, and cost but little more than the ordinary sets. Funnels,



evaporating dishes, and decoction pans in aluminium are also supplied. The "Cradle" Bed Pan (Patent No. 2279), designed by an experienced hospital nurse for invalids, ensures comfort in use by supporting the body from the hips. The spinal column thus rests lightly in the curve without painful pressure. It can be used with or without a pad (which is made specially as an additional comfort) and also as a bed bath. Messrs. Maw, Son & Thompson are agents for this appliance as well as for an improved modification of the well-known French dropping bottles. The new form is made in various sizes, from five to one hundred grammes, and every size delivers uniform drops with a given liquid. Thus forty drops of water from a bottle of any size measure fifty minims, forty drops of

rectified spirit equal twenty minims, and so on. The quick filtering funnel represented in the illustration should be found useful and more satisfactory than the older forms. It is made of glass, and the raised ridges inside are solid elongated wedges, so arranged as to support the paper and prevent it from coming in contact with the sides of the funnel.



Other novelties shown by this firm, which are worthy of attention, are a small spirit stove with a regulator for the flame, a collapsible carrier for six syphons or bottles, a handy French tincture press and a small French pill-piping machine, suitable for small pharmacies, and an elegant new type of counter scale constructed on the plan of a chemical balance. It consists of a skeleton beam supported by a pillar fixed on a walnut stand. The movement is indicated by a pointer, and the beam and pans are supported when out of use, so as to save wear and tear of the bearings, being released by turning a screw in front of the stand. The scales weigh up to two pounds, and turn with a fraction of a grain.

NEW FILTERING CARTRIDGE.

Messrs. Schleicher and Schüll, of Duren, who are well known as manufacturers of filtering paper especially adapted for use in analytical operations, have introduced a very useful contrivance for containing material that is to be extracted with ether or other solvents in the Soxhlet apparatus. It consists of an elongated shell or cartridge of unsized paper, closed at one end and fitting into the Soxhlet apparatus. The material to be extracted is packed into the cartridge, which is arranged so that the condensing ether drops into it and percolates through the cartridge into the receptacle below. By this means perfectly clear ethereal extracts can be obtained with facility, and the cartridge can be used a great number of times for the same purpose.

Obituary.

Notice has been received of the death of the following:—

On November 14, Walter Smyth, Pharmaceutical Chemist, Merthyr Tydvil. (Aged 69.) Mr. Smyth was a Justice of the Peace. He was local secretary for the Merthyr District, and had been a member of the Pharmaceutical Society since 1853.

On November 14, Francis Joseph Allen, Chemist and Druggist, Plymouth. (Aged 27.) Mr. Allen was an Associate of the Pharmaceutical Society, and formerly of the Apothecaries' Hall, London.

On November 15, H. J. Manfull, Chemist and Druggist, Nottingham. (Aged 48.)

On November 17, Henry Stevens Jones, Pharmaceutical Chemist, Fulham. (Aged 74.) Mr. Jones' membership with the Society dated from 1849.

On October 12, Allan Hick, Pharmaceutical Chemist, Wath. (Aged 71.) Mr. Hick had been a member of the Pharmaceutical Society since 1846.

On October 29, Richard Winter, Chemist and Druggist, South Shields. (Aged 73.)

Correspondence.

MEDICAL MEN AND MANUFACTURERS.

Sir,—Will you permit me to use the medium of your Journal to protest against what I consider to be an insult to me on the part of those speculative druggists who seek to instruct me in the treatment of cases committed to my care? Scarcely a day passes without my receiving from the one or the other of those enterprising gentlemen some very positive statement that a particular form of disease can be appropriately combated only by a certain remedy manufactured by themselves; and not infrequently they are good enough to send me the filthy nostrum itself, which I am asked either to try upon myself or to take about with me and try upon somebody else. I could not be expected to contract a gonorrhoea or a typhoid fever in order to test the efficacy of the vaunted remedies; nor would it be honest on my part to make *corpora vilia* of my patients upon the *ipse dixit* of some manufacturer. I do not venture to deny his competency of forming an opinion upon a matter upon which he is, in the nature of things, profoundly ignorant. Meanwhile, I may, perhaps, be permitted to point out to that very objectionable confraternity that, first of all, I treat patients and not diseases; that, secondly, I prefer a remedy carefully adapted to the circumstances of each case to the ready-made thing supposed to fit everybody; that I am quite capable, without extraneous help, to write down, if I wanted such a thing, a *Mistur Tussi*, which, I presume, is intended as the Latin for a cough mixture; that I see no reason why my patients should be mulcted in the additional expense which the large outlay for advertisements entail upon this article; and, lastly, that I have the firm conviction that there may be found some properly qualified pharmaceutical chemist who would be able to dispense my prescription and to supply the drugs of as good a quality as they can be had of the advertiser.

I. G. NOTUS, M.D.

TINCT. MYRRHÆ, B.P.

Sir,—I have been struck with an observation made by Mr. Jones in his paper on tinctures and tincture-making, as reported in the Journal, p. 408, that "tinct. myrrhæ was an example of a tincture which could not be prepared by percolation without previous maceration." So far as I have observed, the myrrh is completely exhausted by percolation alone. I have usually made thirty ounces of the tincture at a time in this manner, following it up by water displacement. The water generally displaces about half an ounce of the tincture, and then the viscid mixture formed by the arabin refuses to pass any more water, and the process stops. Christison, in his *Dispensatory*, remarks regarding the tincture of the Edinburgh Pharmacopœia: "The tincture is best made by percolation. Most of the active principles pass through at the beginning with a little alcohol, forming a thick, viscid, oleo-resinous fluid; and when the spirit directed by the Pharmacopœia has been transmitted, gum alone is left." Perhaps Mr. Jones would kindly give some particulars in regard to the imperfect exhaustion by percolation alone?

Glasgow, N.B.

A. McKELLAR.

Answers to Correspondents, etc.

"A Phosphate Salt."—You fail to authenticate your communication by enclosing your name and address. Read what is published on subject you refer to, on pp. 441-2.

"Micros."—You can procure well-made microscopes and accessories, suitable for your purpose, from numerous good-class firms. Refer to our notices of novel appliances, etc., and advertisement columns.

"Inquirer."—According to *Die Natur*, "cryostase" consists of equal parts of phenol, camphor, and saponin, together with a slightly smaller quantity of oil of turpentine. The mixture is described as solidifying with heat and liquefying again below zero.

"Student."—You can procure a copy of 'Advice to Students,' containing the articles referred to, by sending a stamped and addressed wrapper to the Registrar, 17, Bloomsbury Square, W.C.

John Austen.—Methyl blue appears to permanently stain the callus plates only, and sections so stained can be preserved indefinitely if mounted in glycerin and kept in the dark. A special medium that answers remarkably well for preserving vegetable colours, etc., where most others fail, is prepared by Mr. E. H. Farr, Uckfield, Sussex, who might possibly supply you with some.

Books, etc., received.

SCIENCE PROGRESS FOR NOVEMBER. 2s. 6d. London: The Scientific Press, Limited. From the Publishers.
A TEXT-BOOK OF ORGANIC CHEMISTRY. By A. BERNTHSEN, Ph.D. Translated by George McGowan, Ph.D. Second English Edition. Pp. i.-xx., 1 to 596. 7s. 6d. London: Blackie and Son. From the Publishers.
YEAR-BOOK OF PHARMACY FOR 1894. Pp. 567. 7s. 6d. London: J. and A. Churohill. From the Secretaries.

Diary of the Week.

SATURDAY, DECEMBER 1.

Pharmaceutical Football Club v. St. Michael's, at Wormholt Farm, Shepherd's Bush, at 3 p.m.

MONDAY, DECEMBER 3.

Society of Chemical Industry (London Section), at 8 p.m.

"The Rational Sterilisation of Alimentary Liquids," by E. W. Kuhn.

"An Investigation of the Natural Sodium Sulphate Lakes of Wyoming, U.S.A.," by Dr. D. H. Atfield.

"Specimens of India-rubber, and Petroleum Oil, Varnish and Soap," will be exhibited by Thomas Christy.

Royal Institution, at 5 p.m.

General Monthly Meeting.

TUESDAY, DECEMBER 4.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

WEDNESDAY, DECEMBER 5.

Pharmaceutical Society of Great Britain, at 11 a.m.

Meeting of the Council.

Society of Arts, at 8 p.m.

"The Electrical Treatment of Sewage," by M. E. Hermite.

T. C. W. Martin Testimonial.

Presentation by Mr. E. N. Butt, at 16, Bloomsbury Square, at 6 p.m.

THURSDAY, DECEMBER 6.

Chemical Society, at 8 p.m.

Ballot for the Election of Fellows.

"The Use of the Globe in the Study of Crystallography," by J. V. Buchanan.

"Latent Heats of Fusion," by Holland Crompton.

"New Method of Preparing Dihydroxytartaric Acid," by H. J. H. Fenton.

"Essential Oil of Hops," by A. C. Chapman.

Linnean Society of London, at 8 p.m.

"A new Revision of Diptero-carpea," with lantern slides, by Sir D. Brandis.

"On the Spinning Glands in *Phrynus*," by H. M. Bernard.

Chemists' Assistants' Association, at 8.30 p.m.

Discussion: "Can we stop 'Company' Pharmacy?" Opened by H. B. Care.

FRIDAY, DECEMBER 7.

Quekett Microscopical Club, at 7 p.m.

Exhibition of Objects.

SATURDAY, DECEMBER 8.

Pharmaceutical Football Club v. Bloomsbury, at Wormholt Farm, Shepherd's Bush, at 3 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Austen, Carter, Clague, Elborne, Ellinor, Hill, Johnstone, Laing, Morley, Newholme, Smith, Symes, Young.

ON THE INFLUENCE OF ALCOHOL ON CHLORAL HYDRATE.*

BY E. SCHÄR.

In studying the action of chloral hydrate upon living substance, I made use of various aqueous and alcoholic solutions of this compound, and observed a rather curious behaviour of the substance with alcohol. This behaviour, being then quite new to me, although perhaps already noticed by others, and not having been till now described in detail, a brief description of it may perhaps be of interest.

It is well known that the official chloral hydrate, resulting from anhydrous chloral or trichloraldehyde ($\text{CCl}_3\text{—CHO}$) by contact with water, has been considered either as a "molecular compound" of chloral with one mol. of water, that is to say, as $\text{CCl}_3\text{—CHO} + \text{H}_2\text{O}$, or as a closed compound, viz., as the glycol of trichlorethylidene [$\text{CCl}_3\text{—CH(OH)}_2$]. It would not be convenient on this occasion to mention the reasons for these opinions, and it will be sufficient to say that the idea of chloral hydrate being a molecular compound seems to be supported by the fact that the compound, when heated to the boiling point, is dissociated to that degree that the vapour, as shown by the determinations of its density, consists as to one half of molecules of anhydrous chloral and as to the other of molecules of water.

The same difference of theoretic consideration comes out also for the closely allied chloral alcoholate



which plays an important part as an intermediate product in the preparation of chloral, and has been mentioned in all newer pharmacopœias on account of being confounded with the hydrate. This compound (alcoholate), as regards dissociation by heat, behaves in the manner already noticed for chloral hydrate.

There is no doubt as to the solubility of chloral hydrate in water and in alcohol, and chemical handbooks and pharmacopœias generally state that it is readily soluble in both liquids (1 part of water at 0°C . dissolves two parts at 15°C ., about four parts of the hydrate). On the other hand, there are various discrepancies as to the solubility of chloral alcoholate in water. All the statements are based upon the supposition that it is to a certain degree soluble. In one place the "slow but easy" solution of the alcoholate in water is noticed, in another we are reminded "of the difficult solubility in cold water," while F. A. Flückiger (*Pharm. Chem.*, 1888, ii. 93) more precisely describes the behaviour in presence of water in the following terms: "The alcoholate is deliquescent and less soluble in water than the hydrate, so that, after addition of the same quantity of water, first of all it forms oily drops, which are only dissolved by addition of more water, while in case of the hydrate the solution takes place almost instantaneously."

An alcoholic solution of chloral alcoholate behaves in a similar manner with water. When, for instance, a 20 per cent. solution of the alcoholate is mixed with a quantity of water corresponding to

the twenty-fold or thirty-fold weight of the substance dissolved, there is the same instantaneous separation of oily drops sinking to the bottom rather quickly to form a heavy layer of oily appearance. This layer, during a certain lapse of time, when stirred with a glass rod may again and again be divided in numberless insoluble drops, and they dissolve in the water only when kept suspended in the liquid for a long time, or when the oily layer is left to stand under water for one or more hours. When the stratum is then stirred, it dissolves immediately, just as if a layer of melted chloral hydrate had been stirred under water.

This behaviour leaves no doubt as to the fact that chloral alcoholate, as such, is not soluble in water, or only in a very limited degree, and that the progressive solution is the result of a chemical or physical action, the alcoholate being converted into hydrate. But as there is a limit near which diluted alcohol will still dissolve the alcoholate as such, as well as absolute alcohol, it is evident that in the above described experiment the alteration of the alcoholate by contact with water will be more striking and more perfect the smaller the quantity of spirit used for the solution of the alcoholate.

These observations consequently lead to the behaviour of chloral hydrate in alcoholic solution. When a solution of the hydrate in alcohol (in the proportion of 20 to 25 per cent.) is freshly prepared it behaves at first and during a certain time as a solution of chloral hydrate, giving a clear mixture when poured into five to ten times its volume of water. But according to the strength of the alcohol and the prevailing temperature such a solution changes after a time, and assumes more and more the character of an alcoholic solution of chloral alcoholate, becoming more or less turbid on addition of water and depositing oily drops. At last it behaves almost like a solution of chloral alcoholate in spirit of wine. We have then in this case evidence of a change opposed to that which seems to take place when the alcoholate is brought into contact with water. The chloral hydrate may continue to exist for a time as hydrate in alcoholic solution, but it is gradually changed into the insoluble or sparingly soluble alcoholate, the water contained in the molecule being replaced by ethylic alcohol. It may be mentioned incidentally that the oily layer formed on pouring into water an old alcoholic solution of hydrate behaves in the manner already noticed, that is to say, though apparently unaltered, it turns, after a time, into a liquid, readily soluble in water on stirring.

This formation of alcoholate from hydrate was noticed by F. A. Flückiger (l.c. 93), in mixing rather concentrated solutions of chloral hydrate with alcohol. The production of alcoholate, separating as an oily substance of sparing solubility, may be observed by adding to the said mixture some salt soluble in water and in alcohol, as for instance chloride of calcium or iodide of potassium. In fact, by diluting aqueous solutions of chloral hydrate (containing 20 to 50 per cent.) with alcohol, and adding concentrated aqueous solutions of the salts mentioned, we can obtain the separation of oily drops behaving exactly in the manner already described. In these experiments the powerful attraction of these haloid salts for water promotes the separation of water from the hydrate

* Translation of a paper in *Journal der Pharmacie von Elsass-Lothringen*.

and the chemical addition of alcohol, viz., the formation of alcoholate.

As regards the theoretic conclusions which might be drawn from these experiences respecting the particular labile condition of chloral hydrate, it must be granted that, owing to the present view of physical chemistry in regard to the condition of chemical compounds in solution, the relative facility of change of the hydrate into the alcoholate and *vice versa*, cannot *a priori* be interpreted in favour of the opinion that these substances are "molecular compounds."

It is my intention to investigate the special conditions of this change in an alcoholic solution of the hydrate, which sometimes happens within the first hour, and goes on much more quickly at a higher than at a lower temperature.

THE NERVOUS SYSTEM IN THE VEGETABLE WORLD.*

BY J. REYNOLDS GREEN, M.A., SC.D.,

Professor of Botany to the Pharmaceutical Society of Great Britain, and Dean of the School of Pharmacy.

(Concluded from page 416.)

Now, passing to the subterranean part of the plant, let us consider the behaviour of a root in penetrating the soil. It penetrates gradually by virtue of certain rotatory movements, which it is continually carrying out, making its way between the crevices which exist in the soil. It has a downward course, because it is permanently acted upon by a particular force which I have alluded to already, the force of gravitation. This has such influence on the roots, in some mysterious manner, that they always grow downwards. In going through the particles of soil one can see that the root is not at all unlikely to come in contact with impracticable barriers. It will grow, perhaps, against a stone, and then its growth apparently should be stopped. Now it is found that when the root comes in contact with an obstacle of this kind, the stimulus of contact brings about a curvature in the root of such a character that it grows over the obstacle, passes round it, and resumes its downward course when it has got beyond it. This experiment can be readily carried out. You can, by attaching to the growing part of a root, preferably by attaching to it some small body, a piece of card or something of that sort, persuade it that it is in contact with an obstacle that it must avoid, and it will perform a curvature in a perfectly normal way. Mr. Darwin has put on record some very curious experiments on this point.

We will consider next the behaviour of the tentacles of *Drosera*, which bend over when a part of the surface of the leaf is touched. There seems to be a direct understanding on the part of the outside tentacles as to whereabouts the disturbance is coming from. That is a very important point when we consider the sensitiveness of the plant. It is not a mere aimless movement. The tentacles curve over towards the exact point where the fly has settled. We get a very definite movement in direction then. These tentacles are formed of a number of delicate cells, which are arranged in a row, and they are full of living substance with a coloured cell sap. When

this irritation is brought about certain changes take place in these cells. Darwin called the phenomenon one of aggregation, the aggregation of protoplasm into these various shapes. The term we may still use in that way, although it does not convey any very great amount of definite meaning. The aggregation of protoplasm, then, attends the stimulus. The action of the stimulus also produces excretion of a curious character from the end cells of the tentacles, the cells of the gland.

In connection with this process we must note the extreme sensitiveness which these organs show, as well as their appreciation of locality. Mr. Darwin tried various methods of stimulating them, and among others that of laying upon the glands certain small portions of human hair. He found that a little portion of hair weighing, I think, $\frac{1}{1000}$ of a grain, laid on the central glands of these leaves, was sufficient stimulus to cause an inflexion of these tentacles in a comparatively short time. He attempted to compare the difference in power of appreciating sensation between the human tongue and the glands of *Drosera*, and found that his own tongue was not capable of perceiving this amount of weight or contact which was capable of stirring up *Drosera* glands in this way. Indeed, I think he comes to the conclusion that it is two and a half times as sensitive to touch as the human tongue. Another plant which behaves in a somewhat similar way to *Drosera*, but is not quite so sensitive, is the *Pinguicula*, or Butterwort. When a little fly alights on the leaf, which occurs frequently, the leaf curls over in response to the stimulus and encloses the ant or little fly just in the same way as the tentacles of the *Drosera*. It is not so sensitive, but still it works.

You all know that various plants have a climbing habit. They have very weak stems, and they cannot get along by themselves; they must lift themselves up, as it were, into proper relations to the air by catching hold of something and climbing by means of it; some do so by tendrils laying hold of a support. These tendrils are again sense organs that are extremely sensitive, and, as [before], the sensitive part and moving part are not identical. They are always sweeping around slowly in the air in circles, and if they come in contact with anything they respond by a peculiar movement, a contraction of their substance, which leads to a twining round of the substances. Now it has been found that the sensitive part of the tendril has a power of appreciating foreign objects which may be compared to the sensitiveness which *Drosera* itself has shown. Similarly, we find that in the root the sensitiveness to moisture, which is a kind of touch, is equally great. It is by virtue of this that the root is enabled to grow through fairly arid soil; if there is any moisture anywhere the root will find it. In some subtle way its presence seems to be made manifest to it, and a curvature takes place in that direction.

The Senses of Taste and Smell in Plants.

Plants have also a sort of power of appreciating flavour, having, as it were, a rudimentary taste. Let us go back for a moment to this sun dew. *Drosera* can be stimulated not only by contact but by allowing it to taste various materials. Various liquids if placed on the leaves, if appreciated by the plant, inevitably result in a movement of the tentacles. It naturally occurs to us to suppose that it tastes

* Lecture delivered at an Evening Meeting held on Wednesday, November 14.

the fly which it is about to eat. This has been tested, and it has been found capable of appreciating certain substances, and not being the least affected by certain other ones. It does not care for water, it does not care for solution of gum, and it has an utter disregard to the charms of sugar, neither does it care for starch or alcohol. It has an equally apathetic attitude towards olive oil and tea. On the other hand, if you give it a little infusion of milk it will curl up very quickly. It also likes milk, it can do with white of egg, anything indeed which seems to be of a meaty character appears most powerfully to appeal to the rudimentary taste which *Drosera* possesses. Another substance for which *Drosera* has a devoted attachment is ammonium carbonate. Any of these if submitted to it will inevitably cause an inflexion of the tentacles. There is another plant of a somewhat similar character, the *Dionaea*, or Venus's fly-trap. It is a flat leaf which lies open, and has a sort of fringe at the edges, something like your fingers, so that if it is stimulated it closes and shuts its fingers over the object which unfortunately has given it a stimulus. You can see that this, of course, would lend itself to the capture of flies, and it is known as the Venus's fly-trap on that account. If this plant be tested in the same way it is also found to have rudimentary but a perfectly keen power of taste; it does not like watery sugar solutions, but it does like nitrogenous material such as extract of meat and similar bodies.

Taste and smell in our own case are not very far apart, indeed, a condition of the sensation which we know as taste very frequently has the power of smell mixed up with it considerably. Now certain plants show behaviour which suggests the sense of smell. The antherozoids or male cells of ferns and other cryptogams, when set free from the place of their formation, make their way to the archegonia which contain the ova and pass down the neck of this receptacle to fuse with the ova. The problem is, How do they find their way to these archegonia? How is it they do not go aimlessly floating about, swimming all over the place just off the prothallium, and never come near the archegonia at all? It is due to a rudimentary power of smell. It has been found that these archegonia excrete peculiar substances, which to our senses are not odorous, and it is found that when these substances are excreted from the archegonia they are appreciated by the little free swimming organisms that are floating about in the neighbourhood, and they make for them; they find the place where this odiferous substance, if I may so call it, is being put out, and they are thereby guided to the particular necks of the archegonia. Various bodies show an appreciation of odorous substances in this way. Professor Pfeffer, perhaps the first observer to deal with this, has ascertained what it is which is excreted from the archegonia of the fern which attracts the antherozoids, and he found it is malic acid. They excrete malic acid, and it is appreciated apparently at a distance by these little bodies; to the malic acid they go, and are thereby directed to the archegonia. Other plants like different substances; some like sugar, some other bodies, and so on, but there seems to be a sort of selective power which the different antherozoids possess. *Saprolegnia*, a fungus which lives on dead flies, likes extract of meat, and is attracted by it. *Aethalium*

is very fond of extract of tan, not a particularly attractive substance in the abstract, but still *Aethalium* likes it, and is repelled by other bodies. Now, although certain substances attract them in this way, there is no inevitableness about the attraction; there is a distinct power of selection; for instance, malic acid in the strength of 1:1000 is very attractive to the antherozoids of the fern, but if you neutralise it with soda so as to make a sodium salt of it it would not care a bit for it. There is, therefore, a power of apparently appreciating fragrance which is undetected by our own senses. Whether this is to be regarded as smell or whether it is taste is perhaps discussable. It may be that it is taste, but that involves, of course, no power of response until the thing is actually in contact, whilst odour can act at a distance, and it seems quite possible that the antherozoids may be drawn from a distance to the archegonia. There is very little excretion, of course, put out from any one archegonium, and it seems as if the response were too quick and too readily brought about for it to be taste.

The Muscular Sense in Plants.

Now we are possessed ourselves of another peculiar sense. We have the power of appreciating weight, an appreciation of external force; that is, we are acted upon by gravity, and we have the power of appreciating difference in the weights which we draw up against gravity. I want you to see that plants also have this peculiar muscular sense just as we have, only in a much finer way. The action of this external force which we know as gravity has such an influence on plants that it makes them take up their normal position, the stem grows vertically into the air, and the root vertically downwards; we do not know why, except that they obey this mysterious force which is leading them in that direction. The sensitiveness of plants to this particular influence is very great. It may be demonstrated easily thus: If you take a plant which is growing, and lay it on its side so that it is, as it were, crossing the line of action of the force, it immediately begins to bend. You find that the root bends downwards, the stem bends upwards, and there you have the thing growing as before, only with a sort of knee-joint in the length of the axis. This sensitiveness is extremely great. It has been ascertained especially with regard to the root, and the root is simplest to experiment upon, because it is not complicated by the presence of leaves. This power is due to a sensitiveness in the tip of the root just as the contact one was. This was brought out well by Professor Pfeffer at the Oxford meeting of the British Association last summer, when he narrated some experiments very lately made under his own direction on this very point. They are extremely interesting on account of their being the latest contribution to the subject. Professor Pfeffer said we must make the plant grow normally without interfering with it by cutting it or doing anything of the kind, so he took a little glass tube and bent it at a right angle, and sealed up the end so that there was a little glass tube with a tiny end bent down. He started a root growing, and as soon as it got long enough he made it grow into the tube. It kept on growing, and when it came to the bend it had to grow round the bend, so it grew round the bend

and got fixed inside. He found when he tried experiments of reversing the direction, the root behaved as if there were nothing of it sensitive except the tip. If the tip were turned vertically downwards, no curvature took place in the other part, whether it were upside, downside, or how it was, but if the tip was put so that it was bent sideways, the curvature took place exactly as it would have done if normally grown. We cannot have a better proof that the tip has, as far as gravitation goes, distinctly a sense of direction.

A great many experiments have been made to show that the root really has the power of appreciating forces acting along it in the direction of its axis, or, if you like, a rudimentary muscular sense, and I should like before finishing just to show you the plan which has been adopted to see how the root behaves if the influence of gravity is eliminated. An instrument used for this purpose is known as the "kleimostat." It consists of a box in which the plant is placed in a pot or case. This is driven by clockwork in such a way that a slow rotation is brought about. The whole thing turns on its axis once in 20 minutes, so that each part of the plant is subjected to a downward pull for a definite, but short period, and then immediately the pull changes in its direction and ultimately becomes reversed, so that practically, every portion in due turn being subjected to the influence of gravity, gravity has no effect on the whole thing. In that case it is found the root does not grow in a normal way, that it takes up a definite rotation to the position in which it is in the pot. It grows out at right angles to the substratum, whatever the direction of the substratum is. That instrument acts by eliminating the action of gravity altogether by making it play on all parts of the plant in succession. Another method was used by an older botanist nearly 100 years ago, an English botanist named Knight, who substituted for gravity a force which could be made much greater, viz., centrifugal force. He grew plants on a wheel that he could make rotate either on a vertical or horizontal axis. When he rotated it on a vertical axis, swinging round with great rapidity, an effect was produced on the attitude of the plant. In the case of a young bean grown upon it, the plant does not grow exactly in the direction gravity would indicate, but in a slanting direction. The shoots slant inwards towards the centre, the root always growing in the direction of the force and the stem against it. There is a sort of resultant position, gravity pulling it down and rotation sending it out, and it adopts an intermediate position between them, growing at an angle of 45 degrees. When the plant was grown on a horizontal axis, so that it rotated vertically, there was no effect of gravitation whatever, and the plant grew in obedience to what is known as centrifugal force, the stem growing inwards towards the centre, the root outwards in the direction of the force. Centrifugal force is that force which causes a string to be tight when you tie a stone to it and whirl it round your head; there is a considerable force on the string, varying with the weight and other conditions. Eliminating gravity in this way, it was found that the root responded to the new force, that it appreciated the new force and utterly neglected the old one.

Conclusion.

In conclusion, let us consider what the bearing of these facts is on the question of "Have plants a nervous system or not?" We have considered instances of both efferent or motor and afferent or sensory mechanisms. We have seen that stimuli received at one place have been expressed in movements or secretions brought about in another place. We must have seen, therefore, that in the plant somewhere there has been the transmission of that molecular disturbance which in the higher animals we call a nervous impulse. There has been the transmission of the irritation, and the production of the movement at a distance, and a movement, moreover, which frequently is out of all proportion to the actual stimulus. A very minute bit of hair put on a *Drosera* could not be expected by its own power to move a single tentacle, yet the whole tentacles of *Drosera* have become deflected. Now a study of the internal structure of plants shows us how in some way it is possible for this stimulus to be conducted. In the case of two cells taken from a part of one of the seeds of one of the palms, the living substance was made to shrink away from the limiting cell walls. It did not shrink away uniformly, but remained in contact at particular places, and at these places a very high power showed a sort of lozenge-shaped enlargement, which was apparently the connecting link between the living substance on the two sides of the cell wall. Now, of course, the question is, what is there in that little lozenge? It was crossed by a large number of very fine streaks which penetrated through the substance of the cell wall. A thick line across the centre is supposed to be an enlargement of a particular single line, and to indicate the thickness of the cell wall. Through small apertures in the cell wall the structure of living substance from one cell communicates with the living substance of the next. We have, therefore, here a rudimentary nerve fibre, a something which will enable the molecular change to pass from cell to cell and so to travel out. You see then we have something which may be called sense organs; we have something which may be called something like nerve fibre. Have we anything which can represent a central mechanism that is in our own case the brain and spinal cord? Well, we have nothing ascertained, nothing differentiated; you may call the root tip, as Darwin did, if you like, a rudimentary brain, on account of its power of perceiving these impulses and responding to them. It is rather a differentiated sense organ, something that corresponds to the papillæ of our fingers, or some sense organs we find in other parts of the sensory cells. The same may be said of the little tip of the canary grass. But still, although we cannot find anything structural, I think we cannot help being logically driven to the conclusion that there is a power in the living substance of the plant of acting as the central mechanism, although it is not differentiated. We are familiar in our animal experiments with a peculiar process known to physiologists as reflex action. It means simply this: that in the absence of consciousness a stimulus applied to a sensory surface is conducted to a central nerve cell and change is set up there, leading to the manifestation of a particular movement, so that you can always call that power of movement out by applying the proper stimulus to the par-

ticular sensory surface. This is very highly developed in the animal world, particularly in the Mammalia. Now in the plant we have something which in a way would cause this. Darwin in his book puts it down fundamentally as an instance of reflex action. It is the nearest thing that illustrates the point in the vegetable world.

You remember I told you that when the gland of *Drosera* was stimulated the protoplasm of the cells of the stalk underwent that curious churning movement which Darwin called aggregation. Now the reflex movement which he found to be possible was something like this: a gland in the centre was stimulated, the stimulus at once set up aggregation in the protoplasm in the cells of that particular tentacle, and the disturbance spread across the leaf, and on to the external tentacles, and there the protoplasm in turn was found to undergo aggregation. But the aggregation set in in these tentacles in the direction from the gland, and not from the point stimulated, that is to say, the impulse passed down the tentacle stimulated, across the leaf, and up the other tentacles to their glands, and then the latter set up aggregation in the cells below them, the change proceeding thus in the opposite direction to the stimulus. In that way the gland acted like the central cell in the spinal marrow of the animal body. This the only approach to a differentiated central nervous mechanism at present known. The correlation of stimulus and movement which I have described, however, points to the presence of such a mechanism, although undifferentiated.

A careful study of the manifestations of plant life in these varying conditions leads us thus strongly to the idea of the essential unity of living substance in Nature. The discovery of protoplasm in the vegetable has led to investigations into its nature and its behaviour, and more and more certainly we reach the conclusion that there is no difference in the innate substance; there is a great deal of difference in the differentiation which must be looked at in connection with the environment, but one throws light upon the other.

OPENING OF THE SOCIETY'S NEW PREMISES IN EDINBURGH.

DINNER OF SCOTTISH PHARMACISTS.

On the evening of Thursday, November 29, a dinner of Scottish pharmacists was held on the occasion of the opening of the Pharmaceutical Society's new hall and laboratories in York Place, Edinburgh, in the saloon of the Royal Hotel. The gathering was a large and representative one, there being upwards of 130 gentlemen present. Mr. J. Laidlaw Ewing, chairman of the North British Branch, occupied the chair, and the vice-chairmen were Mr. Charles Kerr, Dundee, vice-chairman of the North British Branch, and Mr. Robert McAdam, Glasgow.

On the right of the chairman were Sir James A. Russell; Professor Alex. R. Simpson, Vice-President of the Royal College of Physicians; Mr. N. H. Martin, Newcastle, President of the British Pharmaceutical Conference; Rev. Dr. Alison; Rev. D. Morrison; Professor Sir T. Grainger Stewart; Professor T. R. Fraser; Professor J. Gibson; Dr. Littlejohn; Dr. Murdoch Brown; Dr. Stockman; Dr. William Taylor, President Scottish Society of Arts; Dr. C. Kennedy; Mr. Hippolyte J. Blanc, A.R.S.A., architect; Dr. Dewar, Dr.

Proudfoot, Mr. W. Fraser, W.S.; Mr. J. S. Gellatly, S.S.C.; Mr. T. McNaught, S.S.C.; Messrs. W. Martindale, London, J. Johnston, President Aberdeen and North of Scotland Society of Chemists and Druggists, Aberdeen, and J. Rymer Young, Warrington, members of Council; Mr. J. B. Stephenson; Dr. W. Inglis Clark; Mr. P. Boa, President Edinburgh District Chemists' Trade Association; Mr. J. Bowman, Leith, Vice-President Edinburgh District Chemists' Trade Association; Mr. Alex. Kinninmont, Local Secretary, Glasgow; Mr. J. Foster, Vice-President Glasgow and West of Scotland Pharmaceutical Association, Glasgow; Mr. Edward Evans, Liverpool; Mr. A. Gibson, Mr. S. M. Fraser, Glasgow; Mr. J. Buchanan, Mr. Geo. D. Mackay, Mr. J. Heron, Mr. D. Murdoch, local secretary, Falkirk; Mr. A. Davidson, local secretary, Montrose; Mr. Wm. Dow, local secretary, Kinross; Mr. J. Forret, divisional secretary, Central Edinburgh; Mr. H. B. Ezard, L.D.S.; Mr. J. Wood, L.D.S.; Mr. J. I. Fraser, Mr. G. Lunan, Mr. J. W. Sutherland, Dumfries; Mr. J. C. Pottage; also Messrs. R. L. Hendry, D. MacLaren, A. Dobson, G. Coull, B.Sc., W. Duncan, D. Mackenzie, J. Robertson, J. Currie, Glasgow; J. Davies, W. Howieson, Wm. Burley, W. Smith, W. S. Glass, A. S. Birnie, and F. L. Dewar.

On the left were Mr. Carteighe, President of the Pharmaceutical Society; Professor A. Crum Brown, Mr. R. Hampson, Treasurer of the Pharmaceutical Society; Dr. P. A. Young, Treasurer of the Royal College of Physicians; Mr. Walter Hills, London, and Mr. D. Storrar, Kirkcaldy, members of Council; Mr. Bowman Macleod, President Scottish Branch, Odontological Society of Great Britain; Mr. R. Bremridge, Secretary of the Pharmaceutical Society; Professor P. Geddes, Dr. Stevenson Macadam, Dr. Church, Dr. Wm. Craig, Dr. A. Balfour, Portobello; Dr. Whitelaw, Portobello; Dr. Hugh Marshall, Mr. J. Nesbit, Chairman Scotch Board of Examiners, Portobello; Mr. J. Macmillan, Glasgow, Vice-President Glasgow and West of Scotland Pharmaceutical Association; Mr. R. R. Simpson, W.S.; Mr. P. Morison, S.S.C., law agent to the Pharmaceutical Society in Scotland; Mr. A. Garvie, local secretary, Leith; Mr. T. Maben, local secretary, Hawick; Mr. W. Allan, local secretary, Dumfries; Mr. G. L. McGibbon, divisional secretary, West Edinburgh; Mr. C. F. Henry, divisional secretary, East Edinburgh; Mr. J. Jack, Arbroath; Mr. J. H. Hardie, Dundee; Mr. D. B. Dott, Mr. A. Noble, Mr. Fisher, Dumfries; Mr. J. Rutherford Hills, assistant secretary to the Pharmaceutical Society; Mr. R. Dick, Mr. G. H. Laird, Mr. W. Greig, Glasgow; Mr. R. Aitken, Mr. T. Thompson, Mr. Raoul de Dreux Kunz, Mr. T. Symington, Mr. W. Mackay, Mr. A. Kennedy, Mr. D. Mackenzie; also Messrs. W. M. Manson, J. Lothian, W. Allan, Kirkcaldy; J. Slater, C. Arthur, J. R. Young, jun., W. T. Law, Partick; W. Taylor, Somerville Shaw, W. Anderson, W. Cunningham, D. Mitchell, Inverness; W. C. Baker, J. Jackson, W. Duff, Proctor Atkinson, W. P. Wilson, Dunbar; R. Stanhouse, Musselburgh; D. Rainy Brown, James Nesbit, Portobello; and G. Melvin.

Apologies for absence were intimated from the Right Hon. the Lord Provost of Edinburgh, the Right Hon. the Solicitor-General for Scotland, Professor Gairdner, President of the Royal College of Physicians; Dr. P. H. MacLaren, President of the Royal College of Surgeons; Professor Sir Douglas MacLagan, Dr. Bruce Goff, President of the Faculty of Physicians and Surgeons, Glasgow; Dr. Clouston, President Medico-Chirurgical Society of Edinburgh; Mr. W. Gowen Cross, Mayor of Shrewsbury, Vice-President of the Pharmaceutical Society; Professor Bayley Balfour; Professor Cash, Aberdeen; Dr. Cleghorn, Strathville; Messrs. Abraham, Allen, Atkins, Bottle, Gostling, Greenish, Grose, Harrison, Newsholme, Richardson, Schacht, and Southall, members of Council; Professors Attfield, Dunstan,

Green, Greenish, and Ince, London; Mr. J. R. Young, Mr. J. Paterson, Aberdeen; Mr. A. Strachan, Aberdeen; Mr. W. L. Currie, Glasgow; Dr. Paul, Mr. E. M. Holmes, Mr. A. Sutherland, President Edinburgh Chemists' Assistants' Association, etc., etc.

After a sumptuous dinner,

The Chairman gave "The Queen and Royal Family." He said pharmacists were all loyal subjects of Her Majesty, deeply attached to her person and throne. They had lately seen the Prince and Princess of Wales sharing in the sorrows and joys of the Imperial house of Russia. He was glad to think that sympathy would not be thrown away, but that it would lead to a better and more cordial understanding between that great country and our own. He thought it was not out of place there to express the hope that the young kinsman of the Prince of Wales and his wife might have a long and happy life, and that he would follow in the footsteps of his lamented father in securing for that great empire and Europe the inevitable blessings of peace. The Chairman next gave "The Navy, Army, and Reserve Forces," coupled with the name of Lieut.-Col. Storrar.

Lieut.-Col. Storrar, in replying, said that for him to respond for the Navy and Army was something like a registered apprentice replying for the Pharmaceutical Society. But even a registered apprentice knew something more about the Society than an outsider, and it was not too much to say that possibly a volunteer knew more about the Navy or the Army than a civilian. He thanked the Chairman for the way in which he had spoken of those branches of the service. He claimed for the volunteers that they had been a great benefit to the Army as well as to the country. As a nation they had been rather inclined to look down on their soldiers and sailors, but the volunteers had popularised and familiarised the nation with the Army. He had been a volunteer for a long number of years, and he had never regretted being so; it was the only chance he had of getting good healthy out-door exercise. He intended to continue a volunteer until disqualified by age.

The Chairman then proposed "The Lord Provost, Magistrates, and Town Council of Edinburgh." He said it was a characteristic of the great municipal corporations of our day that they were continually adding to their heavy duties and responsibilities. He did not suppose that in the long history of the city of Edinburgh there had been a time when the work devolving upon their corporation had been greater than at the present time. He would not detain them by enumerating the various schemes to which the corporation was committed, but in such a company as that he might refer to the influence for good which the corporation had exercised on the public health of the community. The old city of Edinburgh was a very picturesque and very crowded one, but it was also a very insanitary one—indeed a hotbed of disease. But that was all happily changed. They were greatly indebted for that to the beneficent scheme with which the name of Lord Provost Chambers was associated. In the second place it was due to Sir James Russell as convener of public health, and to the vigour and ability of the veteran officer of health, Dr. Littlejohn, whom they had there. It would not be right were he to say the health of Edinburgh was what it ought to be. So long as a certain building, he would not say adorned a slope of the Queen's Park, so long would they say that the health of the city was not in a satisfactory condition. But when the improvement of the city, which Lord Provost Russell had begun, was completed, the new water supply had been brought in, and the new fever hospital had been erected and smallpox had disappeared altogether, they would enter upon such a period of good health that physicians and pharmacists

alike would look forward to it with some searchings of heart. He coupled with the toast the name of Sir James Russell, an old friend of their Society. During his tenure of the Lord Provostship he received the British Pharmaceutical Conference at their meeting in Edinburgh two years ago with great courtesy, and for that they were deeply indebted to him. They would agree with him when he said that Sir James discharged the duties of the high office of chief magistrate of the city with dignity, with unwearied diligence, to the advantage of the citizens, and with great credit to himself.

Sir James A. Russell, in replying, said the Chairman referred to the changes taking place in connection with municipal government, but some of those changes were not new as regarded the city of Edinburgh. He did not know any department of human life which was foreign to the government of Edinburgh in olden times. Perhaps the one circumstance in which the corporation of the city differed from that of other corporations throughout the country was in its relation to education, because it had had the charge of a university, and had all along been intimately connected with that university, and had therefore had pressed upon them the necessity of attending to educational interests. The corporation of the city had also had an intimate connection with all branches of the medical profession. He did not know any city throughout the world where the art and science of medicine in all its departments occupies such a high and honourable position as it did in the city of Edinburgh, exerted so much influence over public opinion, or where it enjoyed so high a measure of esteem among its citizens. And he was reminded that their meeting that evening was to unite in the celebration of the opening of the new hall and laboratories of the Pharmaceutical Society in Edinburgh. They rejoiced in everything that added to the convenience, and usefulness and influence of the Pharmaceutical Society, and those other societies which did great work for the public, and they gratefully acknowledged that to those men, or rather the predecessors of the men whom this Society to-day represented, as well as to bygone great men in other departments of medicine, they owed much of the reputation of this city in the world's eyes. They had, as time went on and the town grew old, to make certain changes to adapt it to present-day needs. Such changes were more difficult in a town where one was trammelled by a history of the past, where one must have regard to the conservation of the monuments of past history and persons passed away. That made improvement schemes in Edinburgh have peculiar difficulty. The chairman had first referred to the fact that he himself had been associated with the initiation of very large improvement schemes. He assured them that to further the conservation of the historical relics and the historical figures of this town, while at the same time making provision for the better health of the citizens, was a very, anxious and serious matter. He would not willingly throw down one stone of the houses of Old Edinburgh that could possibly be maintained, and yet at the same time the world must be fitted for the men who lived in it to-day, for they could not live from day to day on the memories of the past, and all they could do was to make the best compromise that was possible in the circumstances. They were sincerely desirous to keep up the reputation of the city for beauty, to keep up its attractions in every possible direction, and to make its institutions, as far as they had to do with them, of the greatest benefit to its citizens and to the world at large, for they knew something, especially in matters of education, and they gladly welcomed men from all parts of the world who came to study there the various branches of literature and

science, and especially the sciences connected with medicine. He did not know the nationality of the gentlemen practising pharmacy in the city, but he had often been struck by the number of nations represented in the roll of the classes at the University. A good few years ago he had occasion to look up the nationality of the students attending the largest class in the faculty of medicine, and he found that less than one half were Scotsmen. There were about as many Englishmen as Scotsmen—he thought something like 45 per cent. were Scotsmen and 45 per cent. Englishmen, and the rest from all parts of the world, largely from the colonies—making an international university which certainly was very good for themselves. Here away in the north they would be cut off from that width of view and broadness of mind which was to be gained by associating with men belonging to other nations were it not that their institutions had brought other nations to them to influence their young men. He trusted that the health of the community would go on improving. He had no doubt it would. He had no fear whatever that the fees of doctors or the drugs that would be sold would be in the least degree lessened by any improvements in the health of the city. They would live longer in order to pay more and to buy more. There was no such calamity for either physician or druggist as the death of a patient. He thanked them very much for their kindness.

Professor Sir Thomas Grainger Stewart, who, on rising to propose "The Pharmaceutical Society of Great Britain," was warmly received, said he felt it no easy task to rise to propose the toast of the evening when so many other toasts were yet to be proposed, and several had already been presented so eloquently and responded to so well. But at the same time it was a privilege to be there as a guest of that distinguished company, and he was sure every one who shared that honour rejoiced at being a guest on that occasion. He felt it a very special honour that he should be called upon to propose the toast of "The Pharmaceutical Society of Great Britain," coupled with the name of its eminent President. It was always interesting to watch the processes of evolution and differentiation in men's work. In the early stages of society it would seem as if each man did for himself well-nigh everything, and for long many duties continued to be performed by the same individual. But as civilisation advanced those duties became separated one from another and different individuals took them up. The process was just such as one could trace in the gradual development of the animal series. In the lowest types one found all the functions performed by rudimentary organs scarcely differentiated, but in the higher types to what a point did differentiation go! So it had been in the history of the great profession of medicine. There were in remote periods those who were priests, physicians, surgeons, obstetricians, pharmacists, all in one, but they had become separated, and now physicians and surgeons formed separate groups, as they saw represented by the heads of the great royal colleges who were present that evening, and the pharmacists had grown into an independent body, as was abundantly testified on that hospitable occasion. There seemed no limit to the degree to which differentiation was taking place in medicine, and no doubt on the whole the advantages of specialisation outweighed the disadvantages so long as it was not carried too far, and was associated in every instance with a high standard of general professional culture. The kind of specialist who threw a light like that of a policeman's lantern upon the individual subject was fitted to do good, but it was a disadvantage that sometimes those lantern

rays were surrounded by a wide area of utter darkness. Diffusion of light generally was necessary, as well as concentration on particular subjects. He had of late been much interested in the career of a famous alchemist, whose name used to be familiar to all the students attending the class of Sir Robert Christison—the alchemist Raymond Lully. He might serve as a type of the kind of knowledge which existed in his day on the topics with which this learned Society dealt just at the time when they were busy in Scotland preparing to defend themselves against the English on the field of Bannockburn. Raymond Lully, the alchemist, was making his latest efforts to convert Mohammedans by a remarkable system, which he propounded in his 'Ars Magna.' He was not only an alchemist, but a philosopher in every department, and in some respects possessed views far in advance of his time. No man in the present day dared pretend to a special knowledge over so wide a range, not even the most distinguished member of the Pharmaceutical Society. It was not likely that differentiation would go far in the Pharmaceutical Society itself, but possibly within it even it might one day come that the field was too vast to be mastered and worked out by one individual, and that diffusion should take place in it. If the production of such remedies as antitoxins were to take a prominent place that might of itself constitute a separate branch. The opening of the extended museum and the laboratories in York Place marked an important epoch in the history of the Society. Facilities for study, with free access to the facts, was the first requisite for scientific work in the present day. The provision of proper rooms to work in, and instruments and materials, with judicious guidance and efficient assistance, were the essentials for research. The museum would supply students of pharmacy with the one, the laboratory would supply them with the other. The old days were long gone by in which doctors were trained by mere apprenticeship, and were afterwards let loose to practise for weal or woe upon the community. Doctors were now carefully trained and educated, and were only permitted to practise when they had attained a certain standard of knowledge. There was a time when each doctor had to be his own pharmacist. Now that had long ceased to be in Scotland, and was disappearing in other parts of the island. The pharmaceutical chemist was educated and examined before he was permitted to practise his profession. Some might say: Was it a profession? In his judgment the marks of a profession as distinguished from a trade were that it was pursued by men of culture, and not mainly for the accumulation of wealth. The modern conditions implied that pharmaceutical chemists must be men of culture, and they were pursuing a calling which, although, like other professions, it brought its share of remuneration, yet was not mainly a matter of money-making, but involved many higher considerations. But he would like to say a word about that examination, because he had been an examiner now for a good while in many ways, and his faith in the process of examination did not grow. He found that examinations were very useful up to a certain point, but that they were easily pushed too far. From what he knew of this Society he felt sure it would not push that examination too far—that it would keep the examinations in the right place, and make them really useful. An examination which was reasonable was not one which rejected two-thirds of the educated candidates who presented themselves. An examination which was reasonable was one which did not bring out the ignorant points of a man, but sought to elicit what he knew. He trusted and believed that the examinations of the Pharmaceutical Society were of a kind reasonable in

their nature, sufficient to protect the public; but not unduly severe and not unfair to those who had to submit themselves to them. It was his privilege to associate with this toast the name, not of the chairman—justly as one might name him in connection with such a toast, gladly as anyone in Edinburgh would name him, proudly as anyone would name him who had listened to his speeches—but beyond even the chairman there rose heights of eminence. There was a President of this whole Society, and that President had held his position for a long series of years. He was a man not only eminent in regard to pharmacy, but of wide general culture, and quite famous as an Alpine climber. Early in life he had climbed to the summit of the presidentship of this Society, and he had never come down. Mr. Carteighe was a man of whom the profession might be very justly proud, and he congratulated the Pharmaceutical Society in possessing in him so distinguished a President. He begged respectfully to couple his name with the toast.

Mr. Michael Carteighe, who on rising to reply was received with applause, said he confessed he never, as a mountaineer, expected to have the position which had been placed upon him by the proposer of that toast. He never went up a mountain yet from which he could not get down, but Sir Thomas Grainger Stewart had unfortunately hit on the only failure in his life—that he had got to the top of the Pharmaceutical Society, and could not get to the bottom. He did not know whose fault that was. His friends in the south said, "Are you still President of the Pharmaceutical Society?" and he was obliged to say, with a little nervous trepidation and apology, that he was. And his friends said, "How well you must do them." He had never done them well except when he came to Edinburgh, and he certainly felt it was remarkable that he was not getting people to understand him. But it was really too bad that he should be scoffed at and satirised in this way. It was not his fault that he had a difficulty in getting down. They knew there was no rope in pharmacy, and one could not get down a troublesome peak without the assistance of someone else. He had tried to rope himself to a few of his colleagues to be let down, in order that they might drop into his place. But they were afraid that the rope would break, and they would not accept the responsibility. But this was not a time for long speeches. The object of that meeting was not only that of friendly and social intercourse, but to celebrate an important fact—the completion, so to speak, of the Pharmaceutical Society of Great Britain in Scotland. The laboratory, lecture hall, and examination rooms, which were to be formally opened the next day, would, he trusted, be found to be all they hoped they would be for the purposes of examination. But he was not concerned with the halls, although during his presidency it had been his privilege and honour to be associated with the purchase of the house in which they in Edinburgh now had a habitation, and he had also been associated with further developing and extending those premises—making them complete, as he hoped they would be, for the purposes of examination. But what he wanted to impress upon that company, containing as it did many pharmacists as well as members of other learned professions, was that they did this in no spirit of trade unionism, but in the spirit of the ancient city guild that felt that its duty was, with what few shillings it had to spare, to expend them as far as possible in promoting education and examination, and he was sufficiently conscious of the stability of the body he represented to say that he thought the history of their Society would show that they had been true to that tradition, and that they had acted, whatever the public might think, in a truly

professional spirit in all that they had done. And let him say that no one thing in the course of his presidential career had given him greater pleasure than the fact that from this time forth pharmacy in Edinburgh, the Pharmaceutical Society in Edinburgh, and every member of the craft in Scotland, would have a home and habitation which he ventured to think would be creditable to the greatest historical traditions, not only of Scotland, but of that great educational city of Edinburgh. Edinburgh was a centre of education concurrently with the growth and development of education, technical and otherwise, whatever technical might mean. They knew what it meant, although town and county councils did not always agree about it; but the view they had taken of technical education was to teach men an elementary knowledge of the principles on which science was based, leaving him to work out the particulars as he went along. That was the view his Council took, and he thought gentlemen in Edinburgh took, and he wished in his heart that in addition to those powers of examination which they possessed, they had also that necessary power which was possessed by every other examining body with which he was acquainted—accountants, veterinary surgeons, dentists, *et hoc genus omne*. He wished they had power to enforce a proper curriculum, and so adopt those wise suggestions which Sir Thomas Grainger Stewart had referred to, that their examinations might be relatively lenient and considerate, and might not be made so searching as to come within the domain of what they might call cross-examination and confession. They hoped, however, to continue to do what they could till they obtained the parliamentary powers necessary for being able to enforce a curriculum, and they did not intend to let that matter rest until they had achieved it. Until that time came they had done the best they could. Both north and south of the Tweed they had excellent Boards of Examiners, and now they were about to have associated with their Boards, in regard to the sciences of botany and chemistry, teachers of those sciences, who would, he hoped, keep them from exacting a knowledge of science which, however good in itself, and however valuable, might sometimes be too technical for the average student. Their object was to develop the sciences of botany and chemistry so far as they affected their examinations in this direction, that the chemistry examination for the Pharmaceutical Society should be the chemistry taught everywhere and anywhere, and that the botany examination should be the botany taught everywhere and anywhere, and not their application to pharmacy direct and indirect. The fact was that those who had grown old in their craft forgot what an immense amount of practical knowledge they acquired day by day. They found that when once they left the student's career they had difficulty in associating what was reasonable in a student of twenty-one years in regard to those vague questions always put in examination schedules on elementary knowledge. He confessed that as he got older, like many other men of greater distinction, he felt himself that the essence of examination in science lay in this: that the person who examined should be in direct personal sympathy with the young, should be associated with them day by day, hour by hour, and look upon them as his children. It was impossible for many of them to say they could fulfil that condition, and he was not sure that it would be any detraction to the dignity of the certificate which the Society awarded if, in addition to the eminent pharmacists who composed the Boards of Examiners, they had associated with those pharmacists eminent teachers of chemistry and botany. He was going to say something more—that

if they wanted to look to the history of pharmacy without legislation—unaffected by legislation—they would naturally go to that great city of Edinburgh, for there in Edinburgh had developed within the last century that advanced knowledge of true pharmacy—that was to say, the application of chemistry to pharmaceutical products and their production and application—which was not to be found in any other city in the British Empire. In that city he was quite sure he had the sympathy of everyone when he said that they who were responsible for the government of the Pharmaceutical Society regarded with the utmost satisfaction and congratulation the influence which the men who had distinguished themselves as pharmacists in Edinburgh had had on general education all the world over.

Mr. Charles Kerr proposed the toast of "The Royal College of Physicians and Surgeons," and in doing so said it was very gratifying for them as pharmacists to have amongst them that night so many distinguished men of the medical profession, for it was always their desire to do all honour to the noble faculty of medicine. The medical schools of Scotland were of ancient and world-wide fame, known not only for the eminence of their teachers and the attainments of their students, but also for the great number of original investigators they had sent out into the world. To the student in Edinburgh the College, Minto House, and Park Place were as well known as the Castle, Holyrood, and Scott's Monument were to the visitor and tourist. The Royal College of Physicians and Surgeons had on its roll of members and fellows many of the most illustrious medical men in their country—men who had distinguished themselves for their original work in the science of medicine; others who had brought the art of surgery to a prominence not before attained; others who, as teachers, would have their names handed down on the never-dying roll of fame. The name of Simpson was one which would never fade from the memory of man, and they felt the honour to have at their meeting another of that name, who had so ably carried on and extended the work begun by his uncle half a century ago. As a master of surgery and a teacher of that branch of the profession Dr. McLaren was well known to them all, and he congratulated him on his election to the presidency of the Royal College of Surgeons. He felt pleased that this toast had been allotted to him, for he had a warm heart to his old *alma mater*. He was a student of the College of Surgery over thirty years ago, and those were his happy days, though most of his teachers had gone over to the majority. He should never forget hearing the last lecture the good and godly George Wilson ever gave—a teacher who truly died in harness. He regretted very much that they had not the presence that night of another teacher of his, Sir Douglas McLagan, whose lectures on *materia medica* he had the great privilege of hearing. He remembered well the grand vigour and common sense thrown into those lectures. He put the subject home to one like an arrow from a bow—a teacher without guile or humbug. He was proud and glad to have the company that night of another teacher, the only other remaining of his teachers—Dr. Stevenson MacAdam. From him he learned chemistry, and he had now, framed and hung up in his library, a specimen of his unique handwriting, that would be an heirloom in his family. He was much concerned for the dignity of the Royal Colleges, and he was going to take the liberty of making a suggestion on ethics to their presidents and members. Was it not possible to enact some law making it a misdemeanour for a medical man to give a testimonial to be published by the proprietors of some concoction—good, bad, or indifferent. He had come to know lately to what an awful extent

this begging of testimonials and pushing of proprietary made-up drugs had come. He had a son a medical man who was at present engaged in hospital work. His registered address, however, was his (the speaker's) house, and the amount of stuff in the form of pamphlets and samples that came to the house was appalling. His wife declared that if it went on much longer they would require to get up a jumble sale to clear the lot. He was sorry to say the literature was mostly of a degrading kind—one would think it was meant for men who had never studied in a medical school. He wondered if it was sent to the professors as well as to the young "grads." If so, he had no doubt it was to the waste basket it was sent with disgust. He was a bit of a Tory in pharmacy, and would exclaim: "Oh, shade of Christison, to think your grand old work—the bible of the Scottish pharmacist—is to be supplanted by the flippant Yankee pamphlet!" He hoped their college councils would try by some means to stamp out this dollar-hunting abomination.

Professor A. R. Simpson, Vice-President of the College of Physicians, whose name was coupled with the toast, replied, and said he counted it a high honour to have an opportunity of responding to the toast in that distinguished company, after having been so genially proposed by one of the vice-chairmen. The College of Physicians had been long very intimately connected with the pharmacists of the country. There was a time when the union was so intimate that those of the College were deputed to visit the pharmacists' establishments to see that they were providing the proper quality and sort of drugs for the good of the community. Happily, in the differentiation that had been going on, and the sub-division of labour, the College had been relieved of this part of its functions, and that might well be so, and all the more as such a Society as that was developing more year by year, so as to make it quite unnecessary for the medical profession to consider what kinds of drugs were behind the counters of the leading chemists. He quite sympathised with Mr. Kerr as to what he had said about pamphlets and samples that were sent up and down the country and came to the houses of all the profession. Sometimes he was not quite sure that the remedy lay in the hands of the College of Physicians at all. He thought it should rather lie in the hands of a Society like theirs, which would get functions of its own to enable it to meet such difficulties. So far as the College was concerned, the drugs and pamphlets came in and went to the waste-paper basket. The College of Physicians had had intimate relations with the chemists, but forbade its own members to have anything to do with the business whatever. The College of Physicians was, at one time, rather exclusive in its character; for at the same time that it forbade its fellows to have anything to do with drugs, it forbade them to have anything to do with midwifery and the work of barbers. They had so far changed their opinions that about a century ago they admitted the accoucheur to their fellowship, and one of their members gave the chemists a good deal of work to do in the use of chloroform. They had from time to time allowed them to climb to the eminence of which Mr. Carteighe had spoken, as presidents and vice-presidents, and it was in that capacity that he stood there to thank them for acknowledging this toast as they had done.

Mr. Thomas Maben, Hawick, proposed "The Scottish Universities." He said the toast was one which was always received with enthusiasm in every company of intelligent—and especially educated—Scotsmen. Scotsmen were proud of their country, their literature, and of their educational and national history. Their educational system dated back now for over three centuries, and during all those

years it had ever been regarded as the highest ideal to maintain in perfection those great institutions known all over the world as the Scottish universities. They had good reason to be proud of their universities, of the many illustrious men who had adorned their chairs of learning in the past, as well as the equally illustrious men who occupied those chairs to-day, all of whom had contributed to bring world-wide fame to our country. He coupled the toast with the honoured name of Professor Crum Brown, who came of a race of intellectual giants. The immortal John Brown, of Haddington, and Dr. John Brown, the author of "Pat and his Friends," were well-known names, but there were others not so well known as they ought to be. He had in his library two volumes of scientific and literary essays by Samuel Brown, who fifty years ago in competition with Gregory was second in the candidature for the very chair now occupied by their distinguished guest. Some of those essays, notably those on the atomic theory and the history of chemistry, were of absorbing interest to chemists, and could be read with very great advantage. As heir to all the great traditions of his family, Professor Crum Brown had a heavy responsibility, but he had proved himself equal to the occasion. He was one of the few men of whom it could be said that he would be equally at home in any one of half-a-dozen university chairs. By his chemical researches he had become famous as a chemist, a worthy successor to Gregory and Playfair; he had perpetuated the best traditions of the chair of chemistry, his prelections in the class-room bore brilliant testimony to his ability as a lecturer, and by his work on the Edinburgh School Board he proved himself a liberal-minded educationist. He even shone as an ecclesiastic if not as a theologian on the floor of the United Presbyterian Synod.

Professor Crum Brown, in replying, said he felt that the universities of this country occupied a very high and important position in regard to the whole life of the country, and the whole life of the professions of the country, and that he was not fit to speak in response to such a toast. The science which he had the honour to represent in the University was indebted far more to the art of pharmacy than the art of pharmacy was indebted to it. The whole art of pharmacy was far older than the science of chemistry, and they had inherited a good deal in chemistry from the art of pharmacy, and there were still many points on which the art was ahead of the science. If the art of pharmacy could learn something from the special scientific studies of chemists, chemistry had a great deal to learn from the special work of pharmacists. The relation of the universities of the country generally, or he might rather take the relation of the education of the country generally to the professions generally—because whatever relation the profession of pharmacy had to the University was really the relation which every profession in the country had to the education of the country—was that while the life and existence of the profession of pharmacy did not depend on the sound education of the country, the well-being of the profession of pharmacy had very immediately to depend on the sound education of the people of the country. The great enemy which every educational body had to contend with was the enemy which their profession had to contend with, and that was quackery. They had to fight against that in every form. They all had to fight against the same thing in every branch of education in the country, and it would not be until the people of the country were educated to understand and see that that which was typified by the quack and his allies was nonsense, and that people in a profession really did deal with the wants and neces-

sities of society, that they would turn to them in a loyal manner, with the feeling that the educational bodies of this country had indeed proved themselves fit for the great duties which had been imposed on them. They would not prove themselves fit for that until they had made nonsense of that kind impossible. They had heard it said that a great revelation of health had been attained, and that the professions of pharmacy and medicine might come to an end. They would not easily come to an end, although they might have a hard struggle for existence. An old philosophic writer had said that the profession of medicine consisted of two sides—the therapeutic and the hygienic sides. He said they should aim to make ill people well, and to make people who were well better, and that the time would come when they would not want drugs to cure them of any disease, but some helps in the way of improving, strengthening, and increasing health; so that the profession of pharmacy would not come to an end by the abolition of those diseases upon which at present they were said to be fed, but would increase and have a higher and more important position in society by turning their attention to improving and raising the condition of health of the community. That was a position which they had already taken up to a very considerable extent. He was very much obliged to Mr. Maben for the reference he made to his family. He was very proud of belonging to what he really did consider—he did not think they would think he was egotistical—a special family. He hoped that in future he might be worthy of the kind reference made about him.

Mr. John Johnston, Aberdeen, in proposing "The Medical Profession," said that to do justice to this toast from a pharmacist's point of view was almost impossible. Now that the days of jealousy had passed away, the physician and the surgeon asked the pharmacist to join hands with them in stamping out disease and alleviating suffering. Towards this end the chemist sought to be nothing more than the trusted handmaid of the accomplished physician and surgeon, and it must be a satisfaction to the medical profession to know that they had as their colleagues such an educated body of men, capable of carrying out their instructions and assisting them to the fullest extent in their philanthropic labours; and the cordial relationship which now existed had been greatly promoted by the Pharmaceutical Society. As this happy state of things increased, he hoped the general practitioner who dispensed his own medicines would gradually give place to his more educated brother, who would find more abundant employment for his educated colleague, the chemist. The physicians of the present day should be able to rely on the chemist for the faithful dispensing of his prescriptions, and in turn he hoped the chemist would give up such prescribing as he was unfitted for. Speaking as a Scottish member of the Council, he was proud to be able to say that every year showed that a better and more cordial understanding was springing up between the medical profession and that body to which he had had for nearly fifty years the honour to belong. He sincerely hoped that such cordiality would continue to increase, and that it would be encouraged by such meetings as the present.

Professor T. R. Fraser, who replied to the toast, said he cordially reciprocated the very kind expressions of the gentleman who proposed it, and he had no doubt that the sentiments of cordiality to which he had referred would be maintained in Edinburgh. The medical profession in a very special manner trusted to the pharmacists. They had the utmost reliance on their knowledge and accuracy, and he might venture to say in that mixed audience probably to a greater extent in Scotland than in England or anywhere else. In the

northern portion of the kingdom their interests were much more complex, the pharmacists had the greatest interest in the development of education and the prosperity of the profession of medicine. Many of them might have seen that in the opening address of the President of the Medical Council, in London, he made some remarks which were of peculiar interest. He pointed out how the students of medicine in Scotland were increasing. Those, no doubt, in England were also increasing, but those in Ireland were decreasing. But there was a point of greater interest. He also pointed out that the registered practitioners in Scotland had increased greatly in numbers during the last twenty years, whereas during the last five years they had diminished in number to a considerable extent, and in Ireland to a very large extent. He did not think they should overlook the circumstance of this increase. He did not think anyone would doubt that that increase must have a large interest to the pharmacists of the country, because it meant an increase of the requirements that fell to the work of the pharmacist, and showed that there was a very close relationship of interest between the pharmacist and the medical practitioner. Several times that night they had been occupied in anticipating the inauguration of the extension of the buildings of the pharmaceutical branch. He was glad to see that this extension was not only in the nature of a large hall, but also additional laboratory accommodation. It seemed to him that the purpose of the Pharmaceutical Society was not to increase the extent or stringency of ordinary systematic examination, but rather to test, develop, and encourage the education of their candidates in the more practical part of pharmacy. That he thought was a very correct plan to pursue. The great danger at any time undoubtedly was to elaborate their examination too far, especially in those directions where examinations might be passed by mere cramming. The danger was that candidates after they had passed all those examinations might imagine that they had learned the whole of their subject, whereas they had strictly only learned a very limited part indeed. He thought, therefore, the Pharmaceutical Society if it encouraged the practical work in pharmacy would be doing a great work in developing pharmaceutical education. This incubus of examination was extending on all sides. It was, he thought, warping education in their midst. It was giving them criteria for capacity which were altogether false criteria—which were not the criteria that should teach them the standard by which men were to be judged who were fit for actual work, to fill official positions in life. When he spoke of those evils which were growing, not only in medicine and pharmacy, but in all departments of official professional life from the multiplication of stringent and unnecessary restrictions in examination, he could not help inquiring what was the origin of the system. And he believed he had been assisted by friends who were greater experts in archæology and ancient history than he was as to its origin. He believed the first introduction of this system originated in China. It existed to a great extent there centuries ago, so that no position in that country could be held without a special examination being passed. So that they learned from ancient history how that system had developed, and now they learned how that system had failed to give them men capable of performing functions. He had very great pleasure in responding to the toast.

Mr. J. B. Stephenson, Edinburgh, next gave the toast of "Our Guests." They claimed, he said, to be part of the medical profession, and there was a very close relation between the medical profession and the Church. The physician ought to be—and he believed he was—the ally of the minister of religion. He believed there was a real and deep sym-

pathy between the two, and he coupled the name of the Rev. Dr. Alison with the first part of his discourse. Coming to science, he said it went without saying that science was an appropriate toast with them. There was a disputed question on the *tapis* whether pharmacists belonged to science or art. He had no doubt that pharmacy was both an art and a science. There were many things in pharmacy which were not scientific, but on the other hand they must all be aware that in the details of their calling there was ample scope for the exercise of the scientific mind and of scientific gifts, and it was certain that their profession had yielded a great many eminent men of science, and within their ranks still they had not a few men who were justly entitled to that designation. Such a man they had in Mr. Brady, of Newcastle, whose death they had scarcely ceased to mourn. They were honoured by the company of his not unworthy successor both in the art and science of pharmacy, Mr. Nicholas Henry Martin, a gentleman whom the Conference had honoured by making him president of that body. He commended to them Mr. Martin as the representation of science on that occasion. With regard to art, he asked them to accept their architect, Mr. Hippolyte J. Blanc, A.R.S.A., not only on the occasion of the present completion of the buildings, but on their original conversion for the purposes of the Pharmaceutical Society ten years ago.

The Rev. Dr. Alison expressed his pleasure at being present as the guest of a Society which occupied so high and honourable a place in the estimation and confidence of the community. He referred to the progress which pharmacy had made since the days of the alchemist, and said the Church recognised, as the gentleman who proposed the toast had so well said, that the medical profession and pharmacy as a branch of it, and the profession of the Church were very closely related.

Mr. N. H. Martin, Newcastle, said that although he felt he was a most unworthy successor to Mr. Brady to be mentioned in connection with science, he loved it. It was to him the source of all his happiness, as well as contributing to his livelihood. Pharmacy was in its essence a profession, and in the future those who desired to carry on pharmacy as a branch of medicine must exercise it in a scientific spirit, must qualify themselves by prolonged training and education to exercise the art of pharmacy in the spirit of science and the spirit of a profession, and then only would they deserve to have their health proposed and drunk in connection with such a toast. He felt greatly honoured in replying on behalf of the British Pharmaceutical Conference.

Mr. Hippolyte Blanc also replied.

Mr. Walter Hills, London, proposed "The North British Branch." He said that some two or three years ago the question was raised at the Pharmaceutical Council what is the North British Branch. That led to a definition having been made which they would find in the pages of the *Pharmaceutical Journal*, and the success of the last few years had proved the wisdom of the definition. He thought the success was due in the first instance to the wisdom of those gentlemen who lived in Scotland, and who were then members of the Pharmaceutical Council—to Mr. Baidon, who he was sorry was not able to be there that night, and to Mr. Borland, who was also a member of Council at that time. Since then they had had as representatives of Scotland Mr. Watt and Mr. Storrar, Mr. Johnston and Mr. Young, and they had all aided by their wisdom, and had helped to that good state of feeling between those who lived in the north and south which they all rejoiced in at the present time. The definition he wanted to give in the first instance of the North British Branch was a very wide one—al-

the Scottish branches, whether they belonged to the Society or not, for if they were not members now he trusted they would be in the future. In the second place, he wished to define the North British Branch as all those associated with the Pharmaceutical Society, and with this toast he wished them all prosperity—greater prosperity than they now had. To get a closer definition still, he wished to couple this toast with the executive of the North British Branch and the Scottish Board of Examiners, who had done such excellent work in the past. They who lived in the south were very much indebted to those gentlemen who gave their time to look after the interests of the Society north of the Tweed. He had had the opportunity that morning of visiting the new hall and laboratories, and he was really jealous of the splendid rooms they possessed, and the accommodation for practical dispensing and other examination work. He congratulated them on the splendid premises they possessed. He coupled with the toast the name of Mr. Laidlaw Ewing, their chairman.

The Chairman, on behalf of the North British branch, thanked the meeting for the kind way in which Mr. Hills' remarks had been received.

Mr. W. Martindale, London, proposed "The Board of Examiners for Scotland." He said the examiners had always stood like hard-headed Scotchmen to their duties, and held the balance fairly for the candidates, and he knew they would work in unison, as they always had done with the Board of Examiners in London. He coupled with the toast the name of Mr. John Nesbit, the Chairman of the Board.

Mr. John Nesbit, in replying, said he was sure he was only expressing the feelings of every member of the Board when he said they were gratified that the gentleman who had proposed the toast was one whose name was a household word among British pharmacists. He did not think examining boards were generally popular, and he did not think their examining was in any degree different from that of other Boards. They had difficulties in their examinations, but endeavoured as far as possible to do their duty to those who came up before them, and also to the public. They did not always get thanked for that, and it was gratifying to have such a body of gentlemen as were present thanking them in the way they had done—for they knew that at that meeting there were many professors and gentlemen who were examiners, and the majority had been examined, and therefore knew something about it. He wished to say he thought some misapprehension had arisen about their new premises. They were very excellent premises, and the members were proud of them, and all would agree that they might well be proud of them, and he thought they had really been required. But he thought that some, like Professor Fraser, were under a misapprehension. The laboratories were only for examination and not for teaching purposes, and in that sense they were different from those in London, but he hoped the time would come when they could have laboratories fitted up for teaching purposes also.

Mr. Edward Evans, Liverpool, gave the toast of the Chairman; Mr. Robert Hampson, Treasurer of the Pharmaceutical Society, London, proposed the Vice-Chairman, and Mr. Storrar, Kirkcaldy, proposed Mr. Bremridge, Secretary of the Pharmaceutical Society, and Mr. Rutherford Hill, Assistant Secretary, all of whom briefly replied.

The evening's proceedings were enlivened by songs by Dr. G. Kennedy, and Messrs. T. Thompson, Somerville, Shaw, Charles Taylor, and Raoul de Dreux Kunz, the latter also acting as accompanist.

The company broke up at an early hour of the morning, after singing "Auld Lang Syne."

EXPORT TRADE OF YEZD, PERSIA.

OPIMUM.

Of the exports of Yezd the most important is that of this drug. It was more largely grown in this province than anything else in comparison with their respective values. Various causes have lately conducted to a decided falling off in the cultivation of the poppy. In a good year the total output of Yezd was some 1500 cases, each case weighing about 130 lbs. An average output would be about 1000 to 1200 cases. In speaking of the opium of Yezd, I include not alone that only grown in the province, but also that produced in Khorassan, Tabbas, and even in the Herat district. The crude stuff is sent to Yezd, where it is manufactured. During the past year, viz., 1891-2, the crop has been but a small one. The prices ruling in China and London were low and not remunerative, consequently only about half the usual amount was sown in the Yezd district, and this more for speculative purposes than for anything else. To still further reduce the output the crop, for want of proper spring rains, was a practical failure. Hence the maximum quantity of opium manufactured in Yezd was somewhat under 500 cases. 182 lbs. of the crude material in Yezd makes one case of 130 lbs. manufactured article. Of Khorassan's crude material 195 lbs. makes one case of 130 lbs. A certain portion of the crop is specially manufactured for consumption in the local markets of the country, and is almost entirely supplied by Yezd. It is made into sticks and is used for smoking and eating. Opium smoking is very prevalent in Yezd, and it is said that more is used in this place in that way than in any other town in Persia, with the single exception of Kerman. This habit is gaining ground daily throughout the country. In years past adulteration of the drug was very common, but owing to many and heavy losses by having his cases thrown on his hands, or else being sold at 50 per cent. under current rates, the Persian merchant has in this case learnt wisdom, and has almost entirely discontinued the practice.

ALMONDS.

These are now mostly exported to Bombay, but in good years, i.e., when the European crop is not an average one, kernels, both sweet and bitter, are exported to England. Last year the export was about 1,040,000 lbs. This year there has been a very large decrease.

ASAFOETIDA.

There used to be an export of some 500,000 lbs. of this gum, about 150,000 lbs. being from Yezd and the balance from Tabbas, but owing to the way it was adulterated the price has greatly fallen, and in consequence the trade has nearly died out. In neither of the last two years has one tenth of the amount been exported.

MADDER ROOTS.

Adulteration and a consequent declining market has also practically killed the export trade in this article, which used to be fairly large with Bombay. Prices have fallen from 1s. 8d. per 13 lbs. to 4d.

SAFFRON.

Saffron was sent into the Yezd market from Burugird and thence exported to Bombay. Adulteration has produced the same result as in the previous cases.—*Consular Report.*

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

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Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bramridge,—17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

AFTER the reading of the minutes of the previous meeting last Wednesday, the PRESIDENT drew attention to the recent death, at the advanced age of ninety-one, of Mr. WILLIAM HOOPER (see page 495), one of the few remaining founders of the Society, who was in his time a typical pharmacist of the older school, a very successful man of business, and a collaborator with JACOB BELL in the early efforts to make the Pharmaceutical Society a federation of the trade. On the motion of the PRESIDENT, seconded by Mr. HAMPSON, it was resolved that, on behalf of the Council, a letter of condolence should be sent to the widow.

The report of the Finance Committee did not refer to any but matters of routine either in regard to receipts or payments.

The formal appointment of Superintendents of written examinations and of their deputies was then made, as set forth in the lists at p. 477-8.

On the recommendation of the Benevolent Fund Committee, two grants of twenty pounds each, one of ten pounds and one of five pounds were ordered to be paid. In speaking of the good service rendered by these grants, the VICE-PRESIDENT mentioned the interesting fact that one of the recent recipients of a grant happens to be a direct descendant of JOHN DALTON, one of the first honorary members of the Society. In connection with the discussion of the mode of electing annuitants, Mr. CROSS also referred to the circumstance that a large number of votes have been placed at the disposal of the Committee, as an illustration of confidence on the part of subscribers to the Fund, and as showing the assistance that can be rendered by them in facilitating the election of annuitants.

In the report of the Library, etc., Committee,

the letter received from the Chemists' Assistants' Association on the subject of post-graduate courses of lectures and laboratory demonstrations was mentioned as having been carefully considered by the Committee. Though it was not thought desirable to recommend the adoption of the course suggested, the Committee considered that in all probability the Council would be willing to authorise advanced courses of instruction in the higher branches of pharmaceutical work in the event of a desire being expressed by a sufficient number of pharmaceutical chemists. The PRESIDENT gave more precise expression to the limits of this disposition by stating that the term "post graduate" must be understood as meaning that the Major examination had been passed. To that extent the Council would be glad to support any scheme tending to the promotion of pharmaceutical knowledge.

In notifying the resignation of Mr. ABRAHAM as a member of Council, the PRESIDENT gave expression to his sense of the services he had rendered in that capacity, and as the representative of an historic house, regretting the loss of his assistance the more as it is partly due to the effects of the railway accident Mr. ABRAHAM met with some years ago, and suggesting that, on behalf of the Council, this feeling should be communicated to Mr. ABRAHAM. In seconding the motion, the Vice-President informally drew attention to the circumstance that there are at present only five members of Council actually resident in London, and in this respect suggested that in filling up the vacancy the requirements of executive work should be duly considered.

A letter received from the Colonial Office, in which the Marquis of RIFON requested the Council to forward any observations that might be requisite in reference to the Act passed by the Legislature of Barbados for regulating the practice of pharmacy in that island, was referred to the Library, etc., Committee to deal with.

In reporting that, together with some members of the Council, the PRESIDENT had attended the inauguration of the Society's new premises in Edinburgh, expression was given to the gratification experienced at the excellence of the arrangements which have been made for carrying on the examinations. The part taken in that work by Mr. LAIDLAW EWING, the Chairman of the Executive, and by Mr. W. HILL, the Assistant Secretary, was mentioned as calling for special appreciation by the Council, as well as in Scotland where it has given rise to general satisfaction. The other members of Council present at the inauguration, concurred in the opinion that the accommodation now provided in Edinburgh had been carried out with great regard to utility and economy, and that the reception accorded to

them had been marked by the hearty hospitality always characteristic of Scotchmen.

The report of the General Purposes Committee included recommendations as to the election of members of the Board of Examiners for England and Wales, and the PRESIDENT, in moving the adoption of the report, entered into a full explanation of the proposed alterations, dwelling especially on the advantages to be anticipated from the appointment of professional examiners in the subjects of chemistry and botany, and on the reasons for the selections which had been made by the Committee. The motion was formally seconded by the VICE-PRESIDENT, and eventually carried unanimously. But Mr. HAMPSON, while entirely coinciding with the spirit of the PRESIDENT's remarks, expressed the opinion that it seemed to him unfortunate such important changes had been brought before the Committee at a late hour on the previous evening. However desirable the introduction of teachers into the Board, he felt some hesitation about the appointment of the Society's own professors. Mr. ATKINS emphasised that opinion and wished his sense of doubt to be recorded as a danger signal. Mr. SCHACHT and Mr. HARRISON followed in the same spirit. On the other hand, Mr. MARTIN, Mr. ALLEN, Mr. MARTINDALE, and Mr. HILLS supported the views expressed by the PRESIDENT, who, in reply, pointed out that the course of action recommended by the Committee has already been adopted by every other qualifying body in the conduct of their examinations.

A vote of thanks to the members of the Boards of Examiners was then passed, especial mention being made of Messrs. CORDER, FLETCHER, GREENISH, and TAYLOR, who retire from the English Board, and of Messrs. GIBSON and NESBIT, who retire from the Scottish Board.

The legal portion of the report stated particulars of the progress made with cases placed in the solicitor's hands, showing that several defendants have paid penalties, and that some cases await trial. In several other cases which have been reported to the Committee proceedings were ordered to be taken.

LECTURES ON DIPHTHERIA.

On Tuesday evening, at the Central London Throat and Ear Hospital, Gray's Inn Road, Mr. LENNOX BROWNE delivered the first of a course of clinical lectures on "Diphtheria," in which he dealt with bacteriological observation as a means of determining doubts in diagnosis. The lecturer commenced by stating that from his early recollection of diphtheria when a pupil, he had never been able to agree with the opinion as to croup and diphtheria being identical, and that by a logical inference every case required the same treatment. In this disagreement he had been sup-

ported by the main body of general practitioners, both in the metropolis and the provinces. Bacteriological researches were now proving that something like forty per cent. of the cases believed to be diphtheritic were not so, and it behoved all practitioners to use every method of examination which would differentiate the real from the false.

The lecturer recited the history of sixteen cases sent for treatment as diphtheritic, showing on the lantern-screen or by enlarged drawings the portraits of the throats of the patients taken at the bedside, together with the corresponding photo-micrographs of bacteriological specimens of the membrane in each example. The result was to strikingly illustrate the power bacteriology possesses to enforce or to modify the bedside diagnosis. All the patients from whom the cultures were taken had been notified into one of the metropolitan hospitals for infectious diseases as suffering from diphtheria, but nearly one half had been proved by bacteriological examination of the throat exudation to be suffering from one or other of the forms of pseudo-diphtheria, of which, with the simple and compound form of true diphtheria, the lecturer classified and described eleven varieties.

Mr. LENNOX-BROWNE stated, in the course of his address, that so early as May, 1887, he had in the second edition of his work on 'Diseases of the Throat,' advanced the view that the principal cause of death in diphtheria is the poisoning of the system by fermentative products of the specific organism. It was nearly two years before the truth of that theory, derived from bedside experience and sharply criticised at the time, was confirmed by the experiments of ROUX and YERSIN, BLEIGER and SIDNEY MARTIN, and the modern treatment of diphtheria by antitoxin is based on that important circumstance.

It was announced that the second lecture would be delivered at the same hospital on Tuesday the 18th at 4.30. p.m. The subject will be "Doubts in Diagnosis as Determined by Clinical Observation." Medical practitioners are invited to attend.

THE CONSTITUTION OF THE ATMOSPHERE.

The popular interest excited by the announcement that a hitherto unobserved constituent of the atmosphere had been discovered by Lord RAYLEIGH, had no doubt considerably subsidised since the meeting of the British Association at Oxford; but the statement made by the President of the Royal Society at the anniversary meeting, that he regards this discovery as "the greatest scientific event of the past year," will naturally awaken curiosity as to the results of the further investigation, which is now being carried on vigorously. So far, it appears that the results arrived at by Lord RAYLEIGH afford a remarkable verification of the remarks

made by Lord KELVIN, as the President of the British Association, in 1871, as to the importance of accurate and minute measurement, though it may seem to the non-scientific imagination a less lofty and dignified work than looking for something new. On that occasion it was pointed out that nearly all the grandest discoveries of science have been the rewards of accurate measurement and patient long-continued labour in the minute sifting of numerical results. This fact is illustrated by the mode in which Lord RAYLEIGH's discovery was arrived at, as a result of investigations originally undertaken with a view to testing the validity of PROUT's hypothesis that the atomic weights of elementary substances are expressed by whole numbers. In the course of that enquiry the desirability of re-determining the densities of some of the principal gases became apparent, and that arduous work, undertaken by Lord RAYLEIGH in 1882, has been since continued with unremitting application. Among other gases operated upon, nitrogen was found to give rise to most unexpected and disturbing difficulties in obtaining concordant results as to the density of the gas obtained from different sources. The gas obtained by abstracting water vapour, carbon dioxide, and oxygen, from atmospheric air, proved to be slightly denser than the nitrogen gas obtained from nitric or nitrous oxides, or from ammonium nitrite. Hence it was inferred that atmospheric nitrogen is a mixture of nitrogen with a small proportion of some heavier gas, hitherto unknown. With the assistance of Professor RAMSAY, Lord RAYLEIGH succeeded in isolating this gas. The methods adopted were to remove nitrogen from atmospheric air by absorption with metallic magnesium, and also by the old process adopted by CAVDENISH of passing through it electric sparks. The nitrous compounds thus produced were then separated by absorption into a caustic alkaline solution.

THE INSTITUTE OF CHEMISTRY.

THERE seems to be a strange absence of harmony among the Fellows of the Institute of Chemistry, some of them being disturbed by uncertainty as to the relations which should exist between them, while others consider that there should not be any doubts on that point. With the view, probably, of relieving any Fellows who suffer from perplexity on that score Professor TILDEN was induced to deliver, last Friday evening, an address conceived in the spirit of Baxter's "Helps over the Stile, etc.," and not inappropriately characterised by him as a sermon. After a long and somewhat desultory discussion, the PRESIDENT tersely summed up the whole matter in the two words "Be honest." This procedure is suggestive of that adopted in the nursery legend by the old woman who lived in a shoe, and it may be hoped that its effect will be attended with an equal degree of finality.

EVENING MEETING IN LONDON.

AN evening meeting will be held at 17, Bloomsbury Square, W.C., on Wednesday next, at 7.30 p.m., when two papers will be read by Mr. E. M. HOLMES, Curator of the Pharmaceutical Society's Museum, entitled "Notes on Opoponax" and "Eucalyptus Oil." A paper will also be read by Mr. JOSEPH INCK, entitled "The Spagirista."

PRESENTATION TO MR. T. C. W. MARTIN.

ON Wednesday last a meeting was held at 16, Bloomsbury Square, for the purpose of presenting a prize of 175 guineas and an illuminated address to Mr. THOS. C. W. MARTIN on the occasion of his completing his fiftieth year of association with Messrs. MAW, SON and THOMPSON. A large number of ladies and gentlemen were present, Mr. E. BUTT, Chairman of the Committee, being in the chair. The Chairman, in opening the proceedings, said that the Committee had accomplished the object for which it was formed, in a manner which he hoped would be satisfactory to all concerned. Mr. MARTIN commenced his career in life fifty years ago, when he was a lad of fourteen summers, with the late SOLOMON MAW, the predecessor and founder of the present firm of MAW, SON and THOMPSON, and he was with that firm still.

He had known Mr. MARTIN for nearly forty years, and thought he was entitled to style him his old friend. Much of the success of pharmaceutical dances might be attributed to the admirable manner in which he carries out the duties which appertained to the office of M.C., and the Benevolent Fund of the Pharmaceutical Society had benefited very considerably owing to Mr. MARTIN's exertions. He believed also that the scheme of appointing divisional secretaries in London, which the Council of the Society adopted several years ago, first emanated from suggestions made by Mr. MARTIN at a time when considerable exertion was made by its chief supporters to try and extend the interest which all pharmacists ought to feel in that Fund. In conclusion, he asked the Honorary Secretary, Mr. FRED BANKS, to read the address which was about to be presented to Mr. MARTIN.

Mr. F. BANKS, the Honorary Secretary, then read the address, and the Chairman presented it, with the purse, to Mr. MARTIN, remarking that money alone did not represent the esteem and respect in which he was held by his numerous friends. He hoped both Mr. and Mrs. MARTIN would long live to enjoy health and prosperity.

Mr. CARTEIGHE expressed the pleasure with which the Council had acceded to the request of the Committee to allow the presentation to take place in that room. The Council was always glad to place its rooms at the disposition of anyone connected with the trade for any legitimate purpose. In particular the Council was glad to show its respect for one who had done so much as Mr. MARTIN had for the Benevolent Fund.

Mr. ROBINSON and Mr. PHILLIPS having also added a few words, Mr. MARTIN thanked his friends for this mark of their kindness. He referred to the Benevolent Fund, to which he considered it the duty of every chemist to contribute, and concluded by repeating his thanks, with those of his wife and daughter.

A vote of thanks to the Chairman and Committee, proposed by Mr. BOTTLE, was carried, as was also one moved by Mr. ROBINSON to the Council of the Pharmaceutical Society, for giving the use of the hall, and the proceedings then terminated.

BENEVOLENT FUND ELECTION.

A meeting for the election of four annuitants on the Benevolent Fund will take place on Tuesday next, at 12 o'clock precisely.

MISCELLANEOUS NOTES.

In a paper recently read before the Berlin Medical Society, Dr. HANSEMAN, Professor VIRCHOW's assistant, denied that LÖFFLER's bacillus was the cause of diphtheria. It was often met with in healthy individuals, and sometimes absent in cases of diphtheria. At the same time, it probably stands in some relation to the disease. It was also stated that the diphtheria of guinea pigs and other animals is different to that affecting human beings, and that Dr. BEHRING's assertions that serum conferred immunity from and cured diphtheria were unproved. Moreover, it is doubtful if serum is harmless, since it may induce disease of the kidneys in patients suffering from diphtheria.

A PAPER on the utilisation of the Agave as a fibre-producing plant was read at the Imperial Institute on Thursday, November 29, by Mr. A. VANDENDRIESCHE, the chair being taken by Professor ARMSTRONG, F.R.S., President of the Chemical Society.

IMPORTANT improvements have been effected recently at the Middlesex Hospital, including the construction of a new operating theatre with seats for 150 students. The cost will be between £4000 and £5000, and subscriptions are solicited. The installation of the electric light at the Hospital is said to have resulted in a saving of over £300 in one year for cleansing operations alone.

WE regret to record the death of WM. FOSKETT E. HORRELL, on Friday, November 30. Mr. HORRELL won the Silver Medal offered by the Pharmaceutical Council for the best Herbarium in 1889, became a REDWOOD Scholar under the old regulations in 1891, and passed the Major examination in October, 1893.

THE Pharmaceutical Football and Cricket Club will hold its annual smoking concert at the Holborn Restaurant, on Tuesday next, December 11, at 8 p.m., when Professor GREEN, Sc.D., M.A., Dean of the School of Pharmacy, will take the chair. Former students of the School and other friends can obtain tickets (1s. 6d. each) from the Secretary to the Club, Mr. T. TICKLE, 17, Bloomsbury Square, W.C.

AT Berlin, on Sunday last, a monument to MITSCHERLICH, the famous chemist, was unveiled in the Chestnut Grove near the University.

A CONSIDERABLE quantity of anti-diphtheritic serum has been successfully prepared by Dr. KLEIN, who has placed a supply in the hands of the editor of the *British Medical Journal* for distribution to provincial hospitals and also offered supplies to fifteen metropolitan hospitals.

THE subject of company promoting and kindred matters continue to be investigated by the committee appointed by the Board of Trade for that purpose, the latest meeting being held under the presidency of Lord DAVEY on Thursday, November 29.

IN addition to the lectures by Professor J. A. FLEMING on "The Work of an Electric Current," the programme of the Royal Institution for the present session includes courses on "The Internal

Framework of Plants and Animals," by Professor CHARLES STEWART; "The English Humourists of the Nineteenth Century," by Mr. W. S. LILLY; "Meteorites," by Mr. L. FLETCHER; "Three Periods of Seventeenth Century History," by Dr. S. R. GARDINER; "Animism," by Dr. E. B. TYLOR; "Stained Glass Windows, etc.," by Mr. L. F. DAY; and others by Dr. A. C. MACKENZIE and Lord RAYLEIGH; whilst Professor DEWAR will lecture on "Phosphorescence and Photographic Action at the Temperature of Boiling Liquid Air," at the first Friday evening meeting, on January 18.

IN a case before Judge BACON, at the Bloomsbury County Court last week, a local dentist was sued by a patient, who sought to recover the amount paid for a set of false teeth. A full set had been supplied at the not exorbitant price of 30s., but it was alleged that when delivered two teeth were missing, the set would not fit, and the rubber of the gums met. Judgment was given for the plaintiff on condition that he returned the teeth, which he expressed himself as more than willing to do.

LAST Sunday was observed in more than eighty places of worship in London and elsewhere as "Museum Sunday," being the third occasion when sermons in favour of the Sunday opening of museums were formally delivered. According to the President and Honorary Secretary of the Sunday Society, the Trustees of the Soane Museum and of the Dulwich Gallery have agreed to open their art collections on Sunday afternoons, eight special exhibitions in London being thus open to the members of the Society, as well as eighty-five institutions throughout the country, supported by national and municipal taxation.

THE death is announced of Mr. THOMAS BELL, aged 78, brother of Sir LOWTHIAN BELL, and a member of the firm of BELL BROTHERS. Mr. BELL was at one time a partner in the Walker Iron Works, and subsequently, in conjunction with Sir LOWTHIAN and Mr. JOHN BELL, established the Washington Chemical Works and the Clarence Iron Works.

THE old-established business of MEASTERS. CORBYN, STACEY & Co., in Cheapside, will in future be carried on by Mr. A. W. WABING, who has been with the firm for the past twenty years.

WE regret to announce the death of Mr. EVAN LEWIS HICKEY, pharmaceutical chemist, of Chelsea, who had been a member of the Society since 1864, and was one of the Divisional Secretaries for London.

MR. W. H. SYMONS, L.S.A., a member of the Pharmaceutical Board of Examiners for England and Wales, who recently received his diploma as M.R.C.S., has now taken the degree of M.D. at Brussels.

ARRANGEMENTS have been made by the British Institute of Public Health for a lecture to be delivered on the antitoxic treatment of diphtheria by Dr. G. SIMS WOODHEAD, the Director of the Research Laboratory of the Royal Colleges of Physicians and Surgeons, in the Examination Hall, Victoria Embankment, on Friday, December 7, at 5 p.m.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, December 5, 1894.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Gostling, Greenish, Hampson, Harrison, Hills, Johnston, Martin, Martindale, Richardson, Sohoacht, and Southall.

The minutes of the previous meeting were read and confirmed.

ELECTION OF ASSOCIATES IN BUSINESS.

The following, having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Donellan, Arthur William Ernest, Crewe.
Thompson, Charles John Samuel, Liverpool.

ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Alcock, James Elsworth, Sheffield,
Scott, George L., Hawick.
Whaley, Charles Edward, Newcastle-on-Tyne.

RESTORATIONS TO THE REGISTER.

The names of the following persons, who had severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

John Douglas, 34, Whitefriargate, Hull.
Henry Charles Drake, 170, Humberstone Road, Leicester.
John Thomas Hancorn, 55, Frogmore Street, Aber-gavenny.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

THE LATE MR. WILLIAM HOOPER.

The PRESIDENT said he heard when in Edinburgh last week of the death of one of the founders of the Society, Mr. Wm. Hooper, who died at Surbiton at the advanced age of ninety-one. Mr. Hooper was the well-known pharmacist of Russell Street, Covent Garden, and was known in early days as a typical pharmacist, a man who believed there was nothing too good for his pharmacy or laboratory, and that economy was not a principle which a pharmacist should consider. He was in the habit of saying to his assistants and pupils that the best was good enough for him, and the best of everything he would have, if possible. His name was formerly a household word in connection with high-class pharmaceutical preparations, and although never, as far as he knew, an officer of the Society, he was sympathetic in all that was done, attended the early meetings, and was associated with Jacob Bell and the rest of the founders at the beginning of the Society. He was generous to those who succeeded him in business, and to all who had been associated with him. His wife, he was happy to say, survived him, and he would suggest that he be authorised to write a letter of condolence to her.

Mr. HAMPSON said he should be glad to second a motion to that effect. When he came to London in 1871 he had the pleasure of meeting Mr. Hooper on a business matter, and he was very much struck with his strong individuality. He was distinctly a man far above the average, both highly honourable, and at the same time of great business capacity. He was a most amiable man, and would long be remembered.

The PRESIDENT, in putting the motion, said it would be interesting to the members to know that there were no less than ten of the original founders still living in various parts of the kingdom, ranging from Cockermouth to Brighton, and most of them, he was glad to know, were well and hearty.

The motion was adopted.

REPORT OF FINANCE COMMITTEE.

The report of this Committee was of the usual character, and recommended sundry accounts for payment.

The PRESIDENT (as Chairman of the Committee), in moving its adoption, said it contained nothing which called for special reference. On the Benevolent Fund account during the election in December the figures would probably be higher. The donation account remained as it was last month, and the Orphan Fund was slightly increased by dividends on Consols. Seven guineas had been received from the honorary secretary of the Junior Chemists' Ball.

The report was unanimously adopted.

SUPERINTENDENTS AND DEPUTY-SUPERINTENDENTS OF WRITTEN EXAMINATIONS.

The following gentlemen were appointed superintendents and deputy-superintendents of written examinations and assistant local secretaries respectively:—

Superintendents.

Aberdeen	Strachan, Alexander.
Aberystwith	Wynne, Edward Price.
Birmingham	Thompson, Charles.
Brighton	Gwatkin, James Ross.
Bristol	Stroud, John.
Cambridge	Deck, Arthur.
Canterbury	Bing, Edwin.
Cardiff	Munday, John.
Carlisle	Hallaway, John.
Carmarthen	Lloyd, Walter.
Carnarvon	Jones, John.
Cheltenham	Barron, William.
Darlington	Robinson, James.
Douglas, Isle of Man	Radclyffe, John C.
Dundee	Hardie, James.
Edinburgh	Stephenson, John Bertram.
Exeter	Lake, John Hinton.
Glasgow	Currie, William Little.
Guernsey	Nickolls, John Bate.
Hull	Bell, Charles Bains.
Inverness	MacKitchie, David.
Jersey	Cole, George.
Kirkwall (Orkney)	Stewart, Duncan.
Lancaster	Vince, James.
Leeds	Reynolds, Richard.
Lincoln	Birkbeck, John Thomas.
Liverpool	Smith, John.
London	Taylor, George Spratt.
Manchester	Kemp, Harry.
Newcastle-on-Tyne	Clague, Thos. M.
Northampton	Bingley, John.
Norwich	Sutton, Francis.
Nottingham	Bolton, Charles A.
Oxford	Prior, George Thomas.
Fenzone	Shakerley, Benjamin.
Peterborough	Heanley, Marshall.
Plymouth	Hunt, Freeman W.
Sheffield	Ward, William.

Shrewsbury	Cross, William Gowen.
Southampton	Dawson, Oliver Robert.
Worcester	George, Henry.
York	Sowray, Joseph.

Deputy-Superintendents.

Aberdeen	Clark, James.
Aberystwith	Ellis, Robert.
Birmingham	Prosser, Frank H.
Brighton	Savage, William Wallace.
Bristol	Keen, Benjamin.
Cambridge	King, George.
Canterbury	Amos, Daniel.
Cardiff	Coleman, Alfred.
Carlisle	Pattinson, Michael Herd.
Carmarthen	Richards, Jonah Palmer.
Carnarvon	Jones, David.
Cheltenham	Palmer, Frank Thomas.
Darlington	Hutchinson, Rev. E.
Douglas, Isle of Man	Young, John.
Dundee	Hardie, James Miller.
Edinburgh	Ewing, James Laidlaw.
Exeter	Harris, Henry William.
Glasgow	Moir, James.
Guernsey	Carré, James Hilary.
Hull	Stoakes, Benjamin M.
Inverness	Bethune, William J.
Jersey	Baker, John Thomas.
Kirkwall (Orkney)	Webster, Rev. David.
Lancaster	Arkle, William.
Leeds	Branson, Fredk. Woodward.
Lincoln	Houfe, Robert William.
Liverpool	Buck, Anthony S.
London	{ Allen, Charles Bowen. Moon, Harry.
Manchester, etc.	Swin, Charles.
Newcastle-on-Tyne	Weddell, George.
Northampton	Mayger, William David.
Norwich	Corder, Octavius.
Nottingham	Sergeant, Farlow Ross.
Oxford	Thurland, Henry.
Penzance	Symons, Netherton H.
Peterborough	Saunders, James Edwin.
Plymouth	Woods, William Herbert.
Sheffield	Morrison, Charles Orr.
Shrewsbury	Blunt, Thomas Porter.
Southampton	Spearing, James.
Worcester	Virgo, Charles.
York	Kendall, Edward Basnipp.

BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£20 to the widow (44) of a member and subscriber, to assist her and her three children to go out to America. (Tottenham.)

£10 to a registered chemist and druggist (68). (Newport, Salop.)

£5 to the widow (65) of a registered chemist and druggist, who has had nine previous grants of £5 each. (Forest Gate.)

£20 to the widow (59) of a registered chemist and druggist, who has an only daughter, a chronic invalid, to support, and is quite without means. (Ealing.)

One case was not entertained, and two stood over for further consideration.

The VICE-PRESIDENT, in moving the adoption of the report, said he had had an opportunity during the last few days of seeing some of the recipients, and in his judgment they were very fitting subjects for the assistance of the Fund. In one case a man of 78 years

had maintained himself in a small way until overtaken by illness, and he was sure they were only too pleased to recommend relief in such circumstances. In another case the person recommended for assistance was a direct descendant of one of the first honorary members of the Society, and a distinguished scientist. Having, through no fault of her own, been brought into greatly reduced circumstances, he felt the proposed relief would be cheerfully voted her. He desired whilst referring to this Fund to call attention to the service that might be rendered by subscribers placing their votes in the hands of the Committee. Through some suggestions which had been made in this respect, some 285 votes had already been so placed, and he had received six more that morning. He felt that the Committee for the time being would at all times be only too happy to make the best use of the power with which it might thus be entrusted.

The report was carried.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.*Library.*

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
	{ Day . . .	437	26	3	16
October . . .	{ Evening . .	140	12	3	6

	Circulation of Books.	Total.	Town.	Country.	Carriage paid.
October . . .		204	103	101	£1 3s. 11½d.

Donations to the Library had been announced (*Pharm. Journ.*, November 17, p. 404), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

For the Library in London—

Cyclopædia of Names, supplement to Century Dictionary.

Roscoe and Schorlemmer, Treatise on Chemistry new ed., vol. 1.

Ostwald, Physico-Chemical Measurements.

Darwin, Practical Physiology of Plants.

Bernthsen, Organic Chemistry, 2nd ed.

British Pharmacopœia, latest reprint, 2 copies.

For the Library in Edinburgh—

Thorpe, Inorganic Chemistry.

McKendrick, Physiology.

Marshall and Hurst, Practical Elementary Zoology.

Sonntag, Pocket Flora of Edinburgh.

Frankland, Micro-organisms in Water.

Fluckiger, Reactions.

United States Dispensatory.

Richter, Inorganic Chemistry.

Museum.

The Curator's report had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
	{ Morning . . .	465	28	5	17
October . . .	{ Evening . . .	86	5	1	1

Donations to the Museum had been announced (*Pharm. Journ.*, November 17, p. 404), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The School Staff had attended and reported upon the classes.

The Committee had considered the resolution forwarded by the Chemists' Assistants' Association, with reference to post-graduate courses of lectures and laboratory demonstrations, but was unable to recommend the adoption of the suggestion. The Committee, however, desired to express its belief that the Council or the

School Staff would be willing to undertake any advanced course of instruction in higher pharmaceutical education, if a sufficient number of pharmaceutical chemists expressed a definite desire for such instruction.

The PRESIDENT, in moving the adoption of the report, said the Committee had very carefully considered the resolution sent by the Chemists' Assistants' Association, but it had some difficulty in understanding exactly what the Council was asked to do. Assuming that "post-graduate" referred to pharmaceutical chemists, the Committee felt that the request for higher pharmaceutical education to be provided for such men might well be considered. If, on the other hand, the meaning was that the Council should provide evening courses of instruction to qualify Minor men for the Major examination, the Committee could not agree with the suggestion. These young men probably took the term "post-graduate" from the medical profession. Post-graduate courses were given at special hospitals, or in special departments of general hospitals, to medical men who were, in many cases, in practice, and all of whom were on the Medical Register and entitled to practise. It seemed to the Committee that it was no part of the Society's duty to provide specialised work for Major men in order to make them proficient in water analysis or any particular department of that kind. Neither was it their duty to provide evening instruction which would enable students to acquire the degree of the University of London, or to pass the examination of any similar body. It was felt, however, as expressed in the report, that if any number of pharmaceutical chemists desired advanced instruction of a truly pharmaceutical kind, not in any special direction but generally, the Council would be willing to assist. He did not think the number who could avail themselves of such instruction would be very great, but if such a demand did exist, it had only to be made by a reasonable number of men, and the Council would undertake it. It was not considered that special post-graduate courses should be given, but he was sure the Council would be glad to support any scheme which would tend to the general advance of pharmaceutical knowledge. The Committee did not think this was what was really asked for, and therefore could not recommend that the suggestion of the Chemists' Assistants' Association be adopted.

Mr. HAMPSON said he understood that if higher instruction in any section of study—chemistry, physics, or *materia medica*—were asked for by a sufficient number, the Council would acquiesce in it. It was not necessary to ask for a general scheme, including all branches.

The PRESIDENT said that was his view. It would be scarcely possible for a sufficient number to be obtained anxious to take advantage of a general scheme.

Mr. BOTTLE said he did not understand that the Council would be asked to do more than assist in such instruction. Some fees would probably be asked from the students.

The PRESIDENT said the view of the Committee certainly was that those applying should contribute a portion of the expense. They did not believe in giving eleemosynary education of any kind.

The report was then unanimously adopted.

RESIGNATION OF MR. ABRAHAM.

The PRESIDENT said Mr. Abraham had written to him, saying he found it necessary to resign his position as member of Council, as he found it increasingly difficult to spare the time requisite to attend the meetings, and he was unable to get through so much work since his nasty accident some two years ago. He then went on to speak of the

kindness he had always received, and to make certain suggestions with regard to the business. He was sure the Council would agree with him that Mr. Abraham should be thanked for the services he had rendered during the short time he had been a member of the Council. He represented a historic house; his father was a member of the Council and was on the Board of Examiners in early days; and both Mr. Abraham and his brother had done a great deal for pharmacy of the highest class in Liverpool. His qualifications were of the highest class, and they were very sorry to lose his services, and still more to find that he should be still suffering from the results of his unfortunate accident. He would suggest that he be allowed to write a suitable letter to him on his resignation.

The VICE-PRESIDENT, in seconding the motion, begged to draw the attention of his colleagues to the fact that there were at present only six who nominally resided in London, and one of these now lived twenty-five miles away. He hoped this would be borne in mind when the vacancy caused by Mr. Abraham's resignation was filled up, because it was of considerable importance in carrying on the executive work of the Society that a sufficient number of members of Council should be available for consultation by the office. These remarks were not strictly in order, but he hoped they would not be considered out of place.

The motion was carried unanimously.

CORRESPONDENCE.

The PRESIDENT reported that a letter had been received from the Marquis of Ripon forwarding an Act passed by the legislature of Barbados for regulating the examination, registration, and practice of druggists, and inviting the Council to forward any observations they might have to offer. He suggested that it be referred to the Library and Museum Committee to deal with; and the suggestion was adopted.

THE MEETING AT EDINBURGH.

The PRESIDENT reported that some members of the Council, with himself, had the pleasure of attending in Edinburgh at the inauguration of the new laboratories and examination hall. Those who then took an official part in the function included Messrs. Hills, Rymer Young, Johnston, Storrar, Martindale, Martin, and the Treasurer, accompanied by the Secretary and Registrar. He need not refer in detail to the splendid entertainment which was given, and in which a number of distinguished Scotch guests took part; but he would say that he and his colleagues highly appreciated the compliment paid to them, and felt that the entertainment was one of those which would be remembered for a very long time by all who took part, and would, he was sure, conduce to the advancement of pharmacy and the Pharmaceutical Society in Edinburgh. On the Friday there was a conversation to which ladies were invited, and a goodly number of pharmacists, assistants, and pupils attended. He felt that they might express their gratification with the completeness of the arrangements for carrying on the examinations, and for the elegance, not less than the practical character of the provision then made, the success of which was largely attributable to the architect. He was also much impressed by the devotion shown for the past nine months, since the work was begun, by Mr. Ewing, the chairman of the Executive, and by Mr. Hill. Mr. Ewing had taken part in Edinburgh in every form of pharmaceutical work, and into this particular work he had thrown his whole heart, securing the maximum of utility and elegance at a minimum of cost, in a way which he felt sure the Council appreciated. The enthusiasm with which his name was received at the various gatherings showed how much he was appreciated in Edinburgh,

and for himself he felt grateful that Mr. Ewing had consented to serve in an important office, not only from the point of view of the official chairmanship, but from the point of view of social intercourse, and his identification with every branch of medicine and science. In Glasgow, on the preceding Wednesday night, he (the President) had the pleasure of meeting a large number of chemists and druggists, who showed that they were not less gratified than were the members of Council at the completeness of the scheme now carried out in the capital of Scotland. The General Purposes Committee at the meeting last night felt it was its duty to increase the salary of the assistant secretary, in view of the future not less than the past, by £50 per annum.

Mr. HAMPSON said he should like to add his gratification at having been able to take part in the function to which the President had referred, and completely to coincide with the views to which he had given expression. He thought there could be no question that the accommodation now provided in Edinburgh not only compared favourably with their own accommodation here, but in some respects was its superior, combining, as the President had said, utility with beauty. Considering the obstacles which had been met, he thought the expenditure had been both wise and calculated to give every satisfaction. He hoped one result might be to draw into their ranks gentlemen whom it was desirable to see amongst them, requiring as they did a great accession of strength in both countries.

Mr. MARTINDALE also expressed his gratification at the preparations which had been made, and his own participation in the inauguration. He considered their Scotch friends had a very compact suite of rooms, well adapted for the purpose. They had not been hampered with conditions such as prevailed in London, and he heartily congratulated their Edinburgh friends on the way in which they had been able to complete their arrangements, combining, as he conceived, proficiency with economy. He also gladly re-echoed the expressions of the President and Treasurer as to the thoroughly Scotch welcome extended to the members of the Council who took part in the inauguration.

Mr. ATKINS said he felt how much he had lost through being unable to join in the visit, owing to the state of his health at the time. He had known some of their Scotch brethren for years, and could quite appreciate the welcome they had extended to the representatives of the Society. He was glad that the committee had recommended the Council to increase the salary of the assistant secretary, in whom he had long thought they had a most valuable official, and it would be wise in anticipating the future, to take care that when they had a good man they should retain him. He had long felt the difference in the position which pharmacists occupied in Scotland and England, moving, as they did in Edinburgh, in an atmosphere in which medicine, science, and the higher qualities of mind held a unique position; and he hinted that this step forward might lead to pharmacists securing even a greater share in the privileges thus enjoyed. He was thankful to hear the report which had been given them of the admirable arrangements which had been made, and that some fears which he entertained of possible difficulties as to light and so on had been surmounted or avoided in the carrying out of the work.

Mr. JOHNSTON said, as a Scotsman, he felt great pleasure in hearing that the members of the Council had been so satisfied with their visit to Scotland. That had justified his own impression that when southerners went north they would receive a hearty welcome. As to the work at Edinburgh, at the meetings he had attended he felt everything was done that was possible

to secure successful results; and he was satisfied that a better hall and better equipped laboratories would not be found this side the Tweed, whilst in Scotland they had nothing at all like it. With reference to Mr. Ewing, it was a great disappointment to Scotsmen to hear that they were likely to lose his services. He was anxious to retire at the last election, but it was felt that Mr. Ewing's services must not be lost until the buildings were finished. He had done his duty well and admirably, and he was sure the members of the Council appreciated the labour and trouble to which he had been put. He was glad to hear that their Secretary in Scotland was to have an addition to his salary, well deserving it as he did. He was to be found at his post morning, noon, and night, and ready to give all the assistance in his power to those who sought his aid.

Mr. HILLS said he must say that he, too, was exceedingly gratified with his Edinburgh visit, with the admirable manner in which the Edinburgh executive had carried out the work and with the attention Scotch pharmacists showed him and his colleagues. To tell the truth, he felt a little jealous at the complete way in which the new buildings had been carried out. He only wished they could hope in England to approach them in the perfection of their details, and he heartily congratulated their Scotch brethren on what they had accomplished.

GENERAL PURPOSES COMMITTEE.

The report of this committee included the usual letter from the solicitors stating the progress made with cases placed in their hands. Several defendants had paid penalties, and some cases were awaiting trial. Several fresh cases of infringement of the Pharmacy Act were reported to the Committee, and proceedings were recommended.

The Committee recommended that an addition of £50 a year be made to the salary of Mr. J. Rutherford Hill, assistant secretary in Scotland, to begin in January next.

Boards of Examiners.

The committee had received the report of the sub-committee and recommended that the following be appointed on the Board of Examiners:—Professor J. R. Green, M.A., Sc.D., Professor of Botany in the Society's School; Mr. A. C. Seward, Lecturer in Botany in the University of Cambridge and Examiner in the Natural Science Tripos; Professor Percy Frankland, F.R.S., Professor of Chemistry, Mason's College, Birmingham; Professor McLeod, F.R.S., Professor of Chemistry Cooper's Hill College; Messrs. G. C. Druce, A. W. Gerrard, W. M. Holmes, F. Ransom, J. E. Saul, W. H. Symons, E. White, and A. E. Tanner.

The PRESIDENT, in moving the adoption of the report so far as regarded the appointment of examiners, said he should like to explain that Mr. Corder was ineligible for nomination on account of age, Mr. T. E. Greenish and Mr. Taylor, as senior members of the Board, retired by rotation, and in the case of Mr. Fletcher and Mr. Tanner, they having been members for the same length of time, a ballot had been taken, with the result that Mr. Fletcher retired. The remaining members of the present Board, with the teachers, were recommended for appointment. He should also state that Mr. Nesbit and Mr. Gibson, of the Scottish Board, retired, as the two who had been longest in office. The recommendation for the appointment of examiners followed to some extent from the decision of the Council to appoint on both Boards gentlemen who had been engaged in teaching botany and chemistry. The sub-committee which had this matter under consideration had looked at the matter from

every point of view, and considered that the gentlemen suggested were in every respect the best adapted at the present moment for inaugurating the new system of examination. They felt that in submitting those names they incurred a certain amount of responsibility, which however they cheerfully accepted. For his own part, he considered that it was not only desirable that one of the staff of the Society's school should be a member of the Board, but that it would be extremely useful, especially at the beginning of a new system, that there should be a connecting link between the Society and the Board. It was also important that the two Boards in England and Scotland should work as far as possible on exactly the same lines. The question of what was an elementary knowledge of chemistry or of botany was very difficult sometimes to define, and it was considered that those who taught those subjects would be able to define it with greater precision than others. The committee also felt that it would be a great advantage to have men of judgment connected with their own body on the Board. In advocating the new mode of examination he held that the contact of professors from outside with their own members would be productive of good all round. Teachers came in daily contact with students, and as a rule they had that sympathy which an examiner always ought to have with the candidates; and it was of the highest importance to select men who had that sympathy. With that view they had chosen for botany, Professor Green and Mr. Seward. The sub-committee felt that the advantages to be obtained by the association of their own professors with the Board overbalanced any disadvantages which might be supposed to arise. There could be no question that Professor Green, from his qualities, was specially adapted for this position.

With regard to the question often raised how far a teacher should be an examiner, seeing that his own pupils came before him, he would say that where there were two examiners it seemed to him there could be no question as to the fairness of the examination. No teacher that he knew of ever examined his own pupils when he was solely responsible. To deal with the Major examination first, that was both written and practical. The practical chemistry would be conducted by both examiners, and each portion would be checked by both; and the same with regard to botany. Therefore, if either had a pupil of his own before him the question of his passing would not be determined by one alone. In the same way with regard to the Minor examination; in practical chemistry two examiners would do the work, with one or more other examiners associated with them. In the oral examination the same thing occurred. If they considered the very small number there were of candidates from the School compared with the total he felt there could be no danger either of undue strictness or undue leniency. The present system now being developed under every examining body was distinctly in favour of the teacher examining his own pupils. It was held that the teacher was really the best person to examine them, and that if there were an external examiner by his side this system was perfect. The examinations of the joint Boards of the College of Surgeons and the College of Physicians, and of Dentists, were all carried out practically in this way. In the south nearly all the examiners were teachers. They all had pupils in the respective hospitals who came before them; there were two in each subject, and they naturally referred their own pupils to the other examiner, so as to avoid any difficult question that might sometimes be raised as to unfairness or jealousy. Many outsiders seemed to think that these examinations were in the nature of competitive examinations. Of course in such a case a few marks, more or less, made all the

difference; but in this case the Board had determined to go on broad general lines, and, with the utmost sympathy for the student, decide whether he possessed sufficient elementary knowledge of chemistry or botany to be put on the Register. For himself, he could not see that there was any difficulty; on the contrary he thought it was only due to the Society, which from its earliest days had advanced chemistry and botany, that its officers should from time to time become members of the Board. Of course each case would be dealt with on its own merits. The examiners were appointed annually, and even if re-appointed they could not remain in office longer than four years.

It was suggested that next year or the year after an arrangement might be come to, by which an examiner, either in chemistry or botany, should retire, so that the new examiners engaged in teaching should not be appointed all at once. He referred to this subject especially because it was important that the position should be understood. His own feeling in the matter was distinctly in favour of the association of the teaching element. The other day at Edinburgh several observations were made with regard to this subject, all pointing to the importance, not only of associating teachers with the examiners, but, where possible, the teachers with the pupils. That idea ran through the whole of the report of the Commission on the new university for London. Many years ago a sort of free-trade university for London was established, and they were now trying to establish something like an antithesis to it in every respect. The ancient universities of Edinburgh, St. Andrew's, Aberdeen, and Glasgow, were immeasurably in advance of English examining bodies in this matter; and he himself thought the names now submitted would make a Board as nearly as possible comparable to those found at those universities conferring qualifications in medicine, surgery, and science. It might be asked why they did not appoint a chemical professor and examiner. But they had to consider the amount of work in which the professors were engaged, and the sub-committee felt that neither Professor Attfield nor Professor Dunstan was free enough to be eligible for appointment, but that Professor Green might find time; and that the relation of botany to its kindred subject, materia medica, and the existence of the Society's museum, all rendered it desirable to appoint Professor Green an examiner at the present moment.

The VICE-PRESIDENT seconded the motion.

Mr. HAMPSON said he should like to say a word or two, he would not say on the other side, because he coincided entirely with the spirit of the President's observations, but because he thought it was a little unfortunate that the Committee was asked on the previous evening, at a very late hour, to consent to a very important and organic change with regard to the examinations. With regard to introducing teachers from outside on to the Board, he thoroughly acquiesced; but he felt some hesitation with regard to the appointment of one of their own professors. He could not help thinking last night what would their old friend, Mr. Sandford, have said to such a suggestion. He was quite sure he would have required a little time for consideration, and he thought it very doubtful whether he would have acquiesced in the report eventually. So far as the gentleman selected was concerned, he was quite sure the Committee could not possibly have made a better selection, but he had some doubt about the propriety of introducing a professor from the Society's own school on to the Board.

Mr. ATKINS said Mr. Hampson had expressed his own feeling on the matter. They had arrived at a point on the rails where the pointman was turning the train on to a new line, or, to put it in another

way, they were to-day making history; and he wished to put on record his sense of doubt as to the wisdom of placing their own professors on the Board of Examiners. No one could go beyond him in his admiration for the particular professor whose appointment was recommended; and if he could fancy himself in the position of an examinee there was no one into whose hands he would prefer to fall; because he should feel sure of the abundance of his knowledge—and the greatest men were always the most considerate—and also of his consideration and sympathy. At first he had had some misgivings about the wisdom of appointing external examiners at all, but when he came to think over the matter all his objections vanished, but he still had doubts about appointing their own professors. It was said that the practice of teachers examining was growing. Undoubtedly: he remembered Professor Michael Foster dealing with that point in a humorous way, and saying that he would remove the dread of examination by examining the men more frequently; but the examinations referred to were, he thought, not qualification examinations, but simply tests of a man's knowledge along the line of a curriculum. He felt some hesitancy about the effect of an act of this kind on other schools, some of whom were doing honorable work in qualifying men for the examinations. The Society's school was undoubtedly a typical school of pharmacy, and its position should be absolutely above all suspicion with regard to those who competed with it in the educational market. He felt it right to express those doubts, though he should not move any amendment or vote against the motion. The whole policy of the country in modern times was that everyone should be above all suspicion of interest in any matter which came before him; of course he felt that their own professors would be *sans peur, sans reproche*, but the question was whether they would always be so considered outside, and in the matter of examinations especially there ought to be no possible ground even for suspicion.

Mr. SCHACHT said he cordially agreed with the motion as he understood it, but in supporting it he must not be supposed to endorse everything which had fallen from the President in proposing it, though of course he always received everything he said with the greatest respect.

The VICE-PRESIDENT hoped the impression would not get abroad that they were appointing interested men as examiners. The principle of appointing teachers at all lay at the root of this question, because, when any teacher was appointed, there was a possibility of his own pupils coming before him. He interposed this remark because he did not think Mr. Atkins quite appreciated the full force of his observations. Professor Green would probably have fewer of his own pupils to examine than if a teacher at some other school of pharmacy were appointed. He heartily supported the motion.

Mr. MARTIN, as a member of the sub-committee, said he endorsed every word which had fallen from the President. Everybody who had had to do with examining qualifying men for professions had felt the difficulty of those examinations; it was almost impossible to differentiate the trained man from the man who was merely prepared for the examination. Training really was of the highest importance, and examination was really of relatively small importance. Probably all would agree that education was the keystone to examination, and that was the reason for associating the teaching element with the Board of Examiners, and in so doing they were forwarding the interests of those who were examined as well as the future of pharmacy. He regretted that any other note had been sounded, and he thought Mr. Atkins scarcely saw the full bearing of his observa-

tions. It was impossible that there should be any suspicion as to the fairness of the Board, and he did not like the suggestion that such a thing could possibly arise. With regard to Mr. Hampson's suggestion as to what Mr. Sandford would have said, he would remind him that Professor Bentley as a member of the Board of Examiners—

Mr. HAMPSON, interrupting, said the illustration did not at all apply.

Mr. MARTIN said if they were to have teachers as examiners at all, surely those who taught chemistry or botany in connection with pharmacy were the most competent men. With regard to collateral schools he trusted that some day schools would be established throughout the kingdom on the same basis as that in Bloomsbury Square, and then the area from which to draw examiners would not be quite so restricted as at present. It was of the utmost importance that those most competent, and who were above all suspicion, should form part of the Board.

Mr. ALLEN said it seemed to him that of all the important work carried on by the Council nothing was more important than the appointment of examiners. They were on the eve of a new departure, and he should not have spoken but for a feeling to which he had given expression the previous evening that there was possibly a little unwisdom in appointing a member of their own school. He was bound to say that, thinking it over, he came unhesitatingly to the conclusion that the best thing he could do was to support the committee on this point. He knew enough of the business of life to be quite sure that there would be some at least who would question this policy. It was not so generally known as was, perhaps, assumed by those who were familiar with the whole aspect of the question, that in the School of Pharmacy the Society had no particle of interest in the ordinary commercial sense of the word. During the whole period of its existence the members of the Pharmaceutical Society, aided and directed by the Council, had been putting their hands into their pockets to train men in what was called ideal pharmacy, to an extent of which the success of the past and the prominence of the present pupils afforded a sufficient guarantee. The point he wished to make was that as councillors, although they might have a parental interest in the School, they had no particle of pecuniary interest in it; they had simply to decide what they considered to be in the best interests of the future of pharmacy. He had been thinking over the matter a long time, and had recently had the opportunity of consulting one or two gentlemen as able to judge of it as any men in London; and having questioned one gentleman in particular, his answer was that he unhesitatingly thought the proper course was to elect one of their own professors. He made a mental note of that, and determined, if ever the subject came up, to adopt the course suggested to him.

Mr. MARTINDALE said it had become almost an aphorism that a teacher made the best examiner; but in making this new departure and appointing teachers, which was agreed on some time ago, the question came up whether the teachers in their own school should be eligible. He fully endorsed the recommendation of the committee on that point, because it would be a great advantage to have the Board of Examiners in touch with the School, and to have continuity and permanence of policy on the Board. He was quite sure the gentleman chosen on this occasion would be above all suspicion. He agreed with Mr. Martin that training was the main thing to be looked to, but the question now before them was simply how the examinations could be most satisfactorily conducted, and from that point of view he heartily concurred with the committee.

Mr. HARRISON said he was glad to think there could be no possible difference of opinion as to the personal merits of the gentlemen whose names had been submitted, and they were all agreed also, he believed, that a teacher was the best examiner, but he did not think they were all agreed that a teacher was the best examiner of his own pupils. He quite admitted that if it were simply a question of ascertaining the proficiency of a candidate, no one would have a better opportunity of doing that than the man who had taught the pupil; but the examiners went further than that. On the results depended a man's legal qualification to practise his calling, and those results ought to be proclaimed by men whose position was altogether above suspicion; the decision must carry confidence outside. He agreed with the introduction of the teaching element, but with reference to appointing their own professors he was not quite so clear. The matter had come upon him rather suddenly, and he should not challenge the decision because it was evidently an experiment, and he preferred to wait and see how it turned out. The appointments were only made for one year or he should certainly have objected, for he confessed he looked forward to the result with some anxiety. If his fears proved groundless, they could go on in the same course, but if it turned out that there was some ground for them they could retrace their steps next year.

Mr. HILLS, as a member of the sub-committee, said he was thoroughly in accord, not only with the motion, but with almost every word uttered by the President, and he rather regretted that Mr. Hampson, Mr. Atkins, and others had spoken rather adversely, though they did not intend to oppose the motion. Mr. Atkins had, perhaps, expressed opinions which might be held by others outside, but he had been ably answered by Mr. Allen, who had apparently at one time held similar views, and had been logical enough to see his way through the objections. Of course, as Mr. Harrison said, they had to learn by experience, and how could they learn whether this was a wise course unless they tried it? It had been agreed by the Council some time ago that teachers should be placed on the Board, and then a sub-committee was appointed which had to select the four best men—two for chemistry and two for botany. In making that selection the sub-committee felt that no better man could be chosen than Professor Green, though he happened to be their own professor; he had been chosen as such professor on account of his high qualifications, and subsequent experience had fully justified his appointment. The Committee, therefore, thought he would make the best examiner—none the less that he was connected with the Society's school—and would form a kind of connecting link between the official part of the Society and the Board of Examiners, and especially with the new members.

Mr. HAMPSON asked leave to add, in reference to the remarks of the last speaker, that the members of the Council came there to express their own opinions, and he should not respect that body at all if they were simply to adopt everything suggested either by the President or by the Committee.

The PRESIDENT remarked that there was not much to say in reply. He would remind members of the Council that they were exercising judicial functions and appointing a judicial body, and the merits of judges on the bench were not usually canvassed in public before they were set to work. He feared some of the observations now made might be a little misconstrued outside. At the same time, he did not in the least object to the matter being discussed. With regard to the suddenness of the

motion, they must remember that most of them were non-resident in London, and that sometimes the business of the Society had to be done in twenty-four hours. He hoped that Mr. Atkins and Mr. Harrison would read the report to which he referred some time ago, where they would find, as well as in articles in the *Nineteenth Century*, his statement absolutely borne out that the best examiner was the man who examined his own pupils. He had satisfied himself also that every other qualifying body in London was doing that at the present moment. Yet objection was raised that this was a new departure. But if all other examining bodies—medical practitioners, veterinary surgeons, dentists, and so on—had their examinations conducted by their professors, the Council would be only following a precedent. With regard to their own examinations, he might explain that no examiner passed a candidate singly and without consultation with his colleagues; and he asked was it likely the sub-committee would select anyone who could not be trusted to act conscientiously and without suspicion? Those objections were absolutely in the air, and no doubt would be brought forward by candidates who failed, but they were absolutely groundless. He believed the experiment would work well, but if it did not succeed the Council could undo it, though they would not take such a course simply on account of clamour outside on a fictitious basis. Mr. Atkins had evidently not read the latest publications with regard to the relation of teaching to examinations, and his views were those which prevailed some thirty years ago. Examinations ought to be conducted under the most favourable conditions to the unfortunate candidates—for they were all more or less nervous—and in order to ascertain whether they had elementary knowledge of the subject. That was where the judicial functions of the Board came in, more particularly when there was a conference between members as to the merits of a particular man, and whether he should pass or not. It was a *reductio ad absurdum* to suppose that one gentleman who would have only one-seventh part in deciding on an examination whether a candidate should be put on the Register would really affect the result. Even if a man were disposed to prostitute his position by favouritism on the one hand or vindictiveness on the other he could not do so without the assistance of six other examiners.

Mr. ATKINS said there was no suggestion of any such possibility. In his own case he merely wished to safeguard himself from the slightest personal references.

The PRESIDENT said Mr. Atkins' argument went in that direction. Whether the examiner were Professor Green or anyone else the same principle would apply; he would not be likely to act unjustly, nor could he do so if he wished, without the assistance of his colleagues. From his experience he was sorry to say that students from the Society's school were often, unconsciously no doubt, subjected to a more searching examination than those from other places. The School of Pharmacy occupied a good position, it was honoured outside as well as inside, and he thought the Committee had acted wisely in recommending the appointment of one of its professors. When in course of time Professor Green retired, or at any other time, he hoped their professors would always be considered eligible, and in his opinion it would be highly desirable that one or more of them should have a seat on the Board of Examiners.

Mr. MARTIN pointed out that the members of the sub-committee had held a great number of meetings, and their opinion was unanimous.

The motion was then agreed to.

The following gentlemen were, in accordance with the above resolution and with a recommendation from the Executive of the North British Branch, appointed Examiners for 1895:—

England and Wales.

Professor J. R. Green, Sc.D., M.A., Professor of Botany in the Society's School; Mr. A. C. Seward, M.A., Lecturer in Botany in the University of Cambridge and Examiner in the Natural Science Tripos; Professor Percy Frankland, F.R.S., Professor of Chemistry, Mason's College, Birmingham; Professor McLeod, F.R.S., Professor of Chemistry at Cooper's Hill College; Messrs. G. C. Druce, A. W. Gerrard, W. M. Holmes, F. Ransom, J. E. Saul, W. H. Symons, E. White, and A. E. Tanner.

Scotland.

Professor Patrick Geddes, Professor of Botany in University College, Dundee; Dr. John Gibson, Professor of Chemistry in Heriot Watt College, Edinburgh; Messrs. Peter Boa, David Brown Dott, and Jonathan Innes Fraser, Edinburgh; James Jack, Arbroath; Thomas Maben, Hawick, and John William Sutherland, Dumfries.

The PRESIDENT then moved a vote of thanks to the Boards of Examiners for their services during the past year, especially mentioning the retiring members, some of whom who were not disqualified by age might again take their seats on the Board.

The motion was unanimously agreed to.

The legal portion of the report of the General Purposes Committee was then adopted, and a special resolution passed authorising the Registrar to take proceedings against the persons named therein.

January Council Meeting.

The PRESIDENT announced that the January meeting of the Council would be held on the second Wednesday of the month.

RECEPTION AND CONVERSAZIONE AT EDINBURGH.

In connection with the opening of the new hall and laboratories at Edinburgh* a reception and conversations were held in the Society's House, 36, York Place, on Friday, November 30.

There were about 350 ladies and gentlemen present, and the visitors were received in the new Examination Hall by the President (Mr. M. Carteighe) and Mrs. Carteighe, the treasurer (Mr. R. Hampson), the chairman of the Executive (Mr. J. Laidlaw Ewing) and Mrs. Ewing, and the following members of the Council: Mr. Martin, Newcastle (with whom was Mrs. Martin); Mr. Martindale, London; Mr. Walter Hills, London; Mr. Rymer Young, Warrington; Mr. J. Johnston, Aberdeen; and Mr. D. Storrar, Kirkcaldy. In addition to most of the distinguished guests who attended the dinner of Scottish pharmacists on the previous evening (see report on page 485) there were also present:—Dr. Clouston, President, Edinburgh Medico-Chirurgical Society; Dr. Bruce Goff, President, Faculty of Physicians and Surgeons, Glasgow; Baillie J. Gulland, J.P., and Miss Gulland; Councillor J. P. Gibson and Mrs. Gibson, Mr. David Lewis, Treasurer of Heriot's Hospital; Mr. T. B. Morison, Advocate, etc.

After the reception the company were entertained to a programme of instrumental music by Dunn and Davidson's string band, while vocal music was admirably supplied by Miss Grace Richardson, and Messrs. J. T. and W. Richardson and Mr. J. H. Kennedy, the glee singing being especially admired.

* Illustrated descriptions of the new buildings were published in last week's Journal, where, however, the illustrations of the two laboratories were accidentally transposed.

In the dispensing and chemical laboratories were the following exhibits:—

IN THE CHEMICAL LABORATORY.

Plants from the Royal Botanic Garden, sent by the Regius-Keeper—Professor J. Bayley Balfour, including—

Ipecacuanha Plant, in flower; with specimens of crystallised emetine hydrochloride, crystallised cephaeline and its hydrochloride, from Dr. Paul. *Jaborandi* Plant, in flower. Red *Cinchona* Plant. Cotton Plant. Tea Plant. Coffee Plant. *Strophanthus* Plant. Insectivorous Plants.

Nepenthes dicksoniana. Pitcher Plant. *Sarracenia purpurea*. Trumpet Plant. *Sarracenia variolaris*. Spotted Trumpet Plant. *Darlingtonia californica*. Side Saddle Flower. *Drosera spatulata*. New Zealand Sundew. *Drosera capensis*. Cape Sundew. *Pinguicula* species. The Butterwort. *Dionaea muscipula*. Venus's Fly-trap. *Cephalotus follicularis*. Australian Pitcher Plant. Photographs of *Aristolochia gigas* in flower. *Drosophyllum lusitanicum*. Portuguese Fly-catcher. Exhibited by W. Hume, Lothian Street. Hand Dynamo and Lamp. Air Pump, Madgeburg Hemispheres, etc. Manometric Flames. Singing Water Hammer. Glass Model Fire Engine. Pulse Glass. Aitken's Koniscope. Siren. Aluminium Water Bath. Nickel Evaporating Basin.

IN THE DISPENSING LABORATORY.

A series of interesting Microscopic Slides. Illustrations of Chinese Art Colouring. Chinese *Materia Medica*, in four volumes, illustrated. Various Exhibits, kindly lent by Dr. Paul and Mr. E. M. Holmes, F.L.S., etc.

These were arranged by Messrs. C. F. Henry and J. A. Forret, Divisional Secretaries; assisted by Mr. W. B. Cowie.

During the interval in the musical programme Mr. Carteighe mounted the platform and referred to the excellent new arrangements which had been made for carrying on the Society's educational work. He said he was sure that it would be acknowledged that their new hall would be a credit to the other institutions of Edinburgh. The buildings were a source of personal gratification to himself because ten years ago he had advocated the acquisition of the present site, although some of his Scottish brethren looked upon that at the time as one of his misdeeds. He claimed for London that they had not forgotten Edinburgh, and it was due to his colleagues that he should say, and he was sure those present would acknowledge it, that they had not been parsimonious in dealing with this matter. They recognised that they must have all the necessary appliances in order to carry out the examinations under the Pharmacy Act. They considered also that in Edinburgh pharmacy should be well represented, whether they benefited in a pecuniary sense or not. He hoped they would not misunderstand him. He was not begging. He was one of those who considered it a benefit to belong to the Society. If any chemist present had not yet joined them, if he would do so he would find that they were not a bad sort of people. It was to the direct interest of chemists and druggists that they should belong to the Society. They in Scotland were logical enough to understand that. No doubt they had much to contend against, but he believed in the personal equipment of the individual, and if one made a living it was all they might expect in these days.

In regard to the buildings he highly commended

good taste and judgment of Mr. Ewing, and he was glad to convey to him the congratulations of himself and his colleagues on the completion of their work. He also had pleasure in conveying those congratulations to Mr. Ewing's colleagues. They had provided a charmingly decorated series of rooms at a minimum of cost. He congratulated also his excellent officer Mr. J. Rutherford Hill. He, Mr. Carteighe, had been associated with him ever since he became the assistant secretary in Scotland, and he was proud of him. His industry, patience, tact, and the goodwill he showed to everyone were known to all, and it was due to his self-denying exertions also that the new buildings had been such a success. In conclusion, he called for three hearty cheers for Mr. Ewing.

The cheers, led off by Mr. Carteighe, were cordially given.

Mr. Ewing, in responding, deprecated the praise which Mr. Carteighe had bestowed upon him. They were much indebted, he said, to Mr. Carteighe himself for the generous interest he had always shown in the progress and completion of the buildings, and also to the whole Council. They were much indebted also to Mr. Stephenson, Mr. Nesbit, and Mr. Hill, who, as a sub-committee, had practically arranged the laboratories in such a creditable manner as to make, he believed, their London friends somewhat envious. He was sure that they were all glad to have Mr. Carteighe with them on that occasion, and along with him, Mrs. Carteighe. Mr. Carteighe was the "Bismarck" of pharmacy.

Mr. Ewing concluded by calling for three cheers for Mr. and Mrs. Carteighe, and these were heartily given.

The musical programme was then resumed.

During the evening light refreshments were served in the Museum and in the Board Room by Mr. David Grant.

The departure of the President was the signal for a lively demonstration, the staircases and entrance hall being lined by ladies and gentlemen, who cheered enthusiastically as the President and Mrs. Carteighe passed out. Mr. Bremridge, the secretary, also received a very hearty parting ovation.

The Society's house was effectively decorated by plants lent by Mr. James Buchanan, Oswald House.

A very pleasant evening concluded about 11 p.m.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting of this Association was held on Thursday, November 22, the President, Mr. R. H. Jones, in the chair. After the usual formal business had been transacted, a paper was given, the substance of which is as follows:—

SURGICAL DRESSINGS.

BY EDMUND WHITE, B.Sc.,

Pharmacist to St. Thomas's Hospital.

Surgical dressings consist of materials treated in a special manner, so as effectually to absorb the discharges from wounds caused by accident or surgical interference. These materials may be in the form of gauze, tissue, wool, etc., and the substances generally used are cotton, wood wool, paper pulp, etc.

Two methods of dressing wounds are in use—the aseptic and antiseptic methods. The first consists in totally excluding all germs from the cut surfaces, and thus it is necessary that everything which may come in contact with the wound, such as instruments, dressings, etc., should be sterilised, i.e., rendered free from living germs. In order to render

the dressings sterile, the following method may be used:—The wool, etc., as required by the surgeon, is placed in a glass jar provided with a lid, and the glass vessel with the lid beside it is placed in the steriliser and subjected to a high temperature for some time, during which all the germs are killed. The steriliser is then opened, a pad of sterilised wool placed over the mouth of the jar, the lid placed in position, and the whole sealed. In this form it is sent to the surgeon ready for use, and is not touched afterwards by the hand or any instrument not previously rendered aseptic. The steriliser used (see *Ph. J.*, ante, p. 191) consists of an iron chamber into which superheated steam can be blown, and is fitted with the usual safety-valve, pressure gauge, etc.

The antiseptic treatment consists in impregnating the dressing with an antiseptic—mercuric chloride, carbolic acid, the double cyanide of mercury and zinc, or salicylic and boric acids being those most commonly employed. This treatment depends on killing any germs present, or which might have access to the wound after dressing. Gauze is extensively used on account of its open mesh and ability to absorb discharges without caking. The gauze impregnated with double cyanide of mercury and zinc is much used, the carbolic gauze stiffened by resin being valued possibly as much for its stiffness as for its antiseptic power.

Bandages may be made of muslin (which should tear without the cross fibres coming out), flannelette, or flannel. Lint (mostly cotton lint) is chiefly used for applying lotions, ointments, etc., to wounds. Absorbent cotton wool is used—as the name implies—to absorb discharges, etc. The absorbent power varies in different specimens, being due to the thoroughness, or otherwise, of the method by which the fat has been extracted. Very highly absorbent wool, however, may absorb so quickly as to form a stiff lump just over the wound. In place of marine sponges, which are cleaned only with great difficulty, so-called sponges of cotton-wool have been largely used for absorbing liquids in cavities, etc., and are used either in an aseptic or antiseptic condition. They are simply pieces of wool held together in the form of a ball by gauze, and on account of their cheapness can be thrown away after use.

Wood wool, consisting of woody fibre finely disintegrated, is used as a dressing for wounds. It is often used between sheets of gauze, forming a tissue, and makes a firmer dressing than cotton wool. Paper pulp is also used in place of cotton wool, and forms a very light and airy dressing; in addition to this it is very absorbent, and is usually used aseptically.

Ligature and suture materials may also be used aseptically or antiseptically. When catgut is used, sterilisation by heat cannot be used: it is usually first soaked in a solution of mercuric chloride or other antiseptic for a week, and then kept in absolute alcohol. Silk, silver wire, silkworm gut, salmon gut, and kangaroo tendon are also employed, and they are sterilised generally by heat or by special methods.

Various materials are used when necessary to protect dressings from evaporation or from soiling the clothing. Gutta percha tissue is largely used, and besides easily adapts itself to irregularities in the surface to be covered. Jaconet—a muslin, waterproofed on one side—oiled paper and oiled silk are also used.

Mr. White described several methods of wound-dressing, and passed specimens round for inspection by the audience. A bandage was also shown, composed of strips fastened in the middle and loose at each end, which was used in certain abdominal operations.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

A meeting of this Association was held on Wednesday, November 28, the chair being occupied by the Vice-President, Mr. John Foster, in the absence of the President of the Association, Mr. W. L. Currie, through illness. Amongst those present were Mr. Carteighe, President of the Pharmaceutical Society, Mrs. Carteighe, Mr. Richard Bremridge, Registrar of the Pharmaceutical Society, and the leading chemists and druggists of Glasgow and the West of Scotland.

The Chairman, in opening the proceedings, said he felt a very high honour had been conferred on the Glasgow and West of Scotland Pharmaceutical Association by Mr. Carteighe so kindly coming to address them. His only regret was that their own energetic president was still unable to be with them. He was sure they would join with him in according a very cordial welcome to Mr. Carteighe, and was certain they would have from him words of wisdom, words of counsel, and, he hoped he might add, words of encouragement. He was hopeful that much good might accrue to both the Pharmaceutical Society and their own Association from this visit. In Glasgow they had opportunities of making the work of the Society better known to the trade, and of trying to get those who still remained aloof from the Society to come within its pale and help in its great work. They also had opportunities of assisting the widows and the orphans of those who had been less fortunate than themselves, and he regretted to say that in Glasgow they subscribed very meagrely towards that object. Further, they had the responsibility of endeavouring to provide for their assistants and apprentices that pharmaceutical education which the law made it imperative they should possess before they could be of much service to their employer or earn a living for themselves. He hoped, therefore, that much good would result from this visit. In Mr. Carteighe they had a strong man and an excellent leader, one who, if backed up by the united voice and sympathy of the trade, would yet by his consistent and persevering efforts help the little barque of pharmacy into a quieter and better haven than it had been in for a long time. Mr. Currie, in his leisure, had formulated some of his views and sent them in writing to Mr. Laing, their secretary, to read to the meeting, in the hope that they might serve as an outline to Mr. Carteighe's speech.

Mr. Laing, before proceeding to read Mr. Currie's paper, said they would be glad to hear that Mr. Currie was feeling a little better. In a letter written to him he expressed his regret at being unable to be present, and said he hoped the meeting would be a very successful one, and that Mr. Carteighe would have a royal reception and a good hearing.

Mr. Currie's communication was as follows:—

"We in Glasgow seem to be so much more at a disadvantage in carrying on our businesses in comparison with other places, that we are disposed to think the powers that be—that is, the Council of the Pharmaceutical Society—should do a little more towards putting things on a better footing.

"We have had it stated that pharmacy as a trade is a failure. If that be so, as a profession it will be a greater failure, and what guarantee has anyone entering our ranks that, after undergoing the requisite training and study necessary to obtain the title Chemist and Druggist, or Pharmaceutical Chemist, that the said title will be his, protected by Act of Parliament. And to make it professional, we have not attained to such perfection as to entitle us to receive that protection which our education and training fit us for. Beyond the personal selling of poisons, any-

one can dispense drugs. But even the sale of poisons and the use of the title is, by a little ingenuity, glaringly infringed. We know that grocers and others by the simple addition of the magical 'and Co., Limited,' defy the Act, and openly call themselves dispensing chemists. This is not as it should be; the title is a personal one, and should not be conveyed in such a way to any company, and, with all deference to the wisdom of Bloomsbury Square, I am of opinion that, should John Jones, a grocer, as an individual, convert himself into a company, he, being a real person, has no right to style himself 'and Co., Limited, dispensing chemists.' What is the use of passing examinations in order to obtain the title if it can be used by any huckster in this fashion?

"We cannot expect to get smart youths to enter our calling when we put the true state of affairs before them, and it is not to be wondered at. I certainly say let us have well educated and trained men as pharmacists, but if the education is to take the form of a compulsory curriculum, then some better measure of protection than we have now must be thought out.

"As regards the sale of poisons, it is distinctly stated in the 17th section of the Act that the name and address of the seller should be on every label, and for the purposes of this section the person on whose behalf the sale is made shall be deemed the seller, and I have always understood this to mean that, allowing such poison has been obtained at any limited company's stores, the name of the qualified chemist should appear on the label. Why, therefore, can poisons be sold with the name of a company and not the name of a qualified individual?

"In regard to the work of the Pharmaceutical Society much has been and will yet be said. The cry has always been, What good will result from joining it? and many objections have been urged against it. One great objection has been that, although one may be a registered man, if not in business on his own account he can have no voice in the conduct of its affairs even though an associate. It should follow that, having passed the necessary examinations, he should, immediately on joining the Society, have a voice in its affairs, whether in business for himself or not, and I admit that in the last two Draft Bills the Council seemed desirous of making this change, but the fault has been long in being remedied.

"The appointment of professorial teachers as examiners in scientific subjects deserves, I think, commendation, and ought to do away with the often expressed idea of unfair examination. I think I have sufficiently indicated some of the points Mr. Carteighe could very well enlarge upon, and while it is always a disadvantage to have to write one's views from a distance, I hope I have helped to forward a meeting to which I have looked forward with much desire, thus in some degree making up for my enforced absence."

Mr. Carteighe, who next addressed the meeting, said: Let me in the first place say that it is a source of very great pleasure to me to have the opportunity of meeting you as representing collectively a definite pharmaceutical body. The last time I appeared here I had to address a meeting—I don't quite know whether it consisted of chemists or druggists, of doctors or doctors' assistants not registered, or what; but I understand I am now addressing an association, and I am sorry that Mr. Currie, your indefatigable president, is not here to-night to take the chair. I am sorry because I have noticed with what interest he has thrown himself into the work of pharmacy in Glasgow. As your vice-president says, it is a slight reflection upon you that you have not been able to emancipate

yourselves completely for so many years, and form an organisation of your own. I do not mean to say there may not have been good reasons—I do not mean to say anything more than that there are probably good reasons for it—but the fact remains that of all the great cities of Great Britain, Glasgow, until within recent years, has not taken any active part in things pharmaceutical, and that is a disadvantage to Glasgow, it is a disadvantage to the Pharmaceutical Society of Great Britain, and it is a disadvantage to its President. On the other hand the formation of an association of this sort, with plenty of the backbone that all you Scotchmen have, is a source of strength to us, even if from time to time you gibbet the President, or differ from him in some matters of detail.

Let me say that I have listened with pleasure to Mr. Currie's observations, and perhaps I may be allowed to say a few words as preliminary before I touch upon the special part of his paper. I am anxious just hurriedly to point out to you the history of pharmacy legislation. That is probably an old story, and if any of you have heard it before, I hope you will forgive me, but it is an important story, and, as every year we have fresh men on the Register, I think it is well that they should know exactly how we stand. Now in 1852 an attempt was made to get a Bill through Parliament by Jacob Bell; we in these days would have called it a Pharmacy Bill. It had nothing to do with poisons, but dealt with the great question of educating and training the pupil how to dispense prescriptions whether containing poisons or not. The idea at that time was that if a man had been educated he did not want the State to tell him to label bottles containing poisons, nor did he want all those safeguards of a mechanical kind which the Legislature is so anxious to put upon us if we will only allow it. Mr. Bell failed in getting any compulsory powers, and although he went to Parliament and spent in the space of a few years something like £15,000 on matters pharmaceutical and political in the interest of the trade at large—I wish to point that out to you, for the benefit of the trade at large—he was unsuccessful in getting the House to assent to anything more than a voluntary regulation by which certain people who chose to do certain things should become "pharmaceutical chemists." That left everybody else pretty much where they were. On and after that date no person engaged in pharmacy could call himself a pharmaceutical chemist unless he joined the Society and passed an examination, and I want to point out to you that it was open to everybody in the United Kingdom to become in 1852 and 1853 a pharmaceutical chemist, and scarcely—what shall I say?—scarcely a tithe of them took advantage of it. Bell's view, after the passing of the Act, was that if we could get all the men engaged in business in Great Britain to come into the Society we should have something to work for, and they could push a step further later on. I do not want to rebuke anyone; that is a matter of history.

The next stage was in 1868, when I was myself upon the scene, and I know the history of pharmacy legislation from 1865 as well as most living men. During that

time I have been scoffed at and scolded and scalped, but still I am alive, gentlemen. In 1866—and I was then on the Council under the leadership of George Sandford, the worthy successor of Bell—we attempted to get through Parliament a Bill on the same lines as the Bill that Bell tried to get through in 1852; that is to say, all persons then engaged in business, and all assistants then *bona fide* engaged in business should not only be brought into the Society, but be registered, and that the right to dispense all prescriptions of whatever kind should be restricted to those persons, and to no others except those who should hereafter pass through a certain amount of training and examination. You will observe there was no question about poisons. We accepted a semi-professional basis again, that the education of the chemist and druggist was the safest thing for the public. Mechanical things are after all only mechanical, and our view was that the educated chemist and druggist, if left to his own discretion, was surely competent to take care of the lives of the public.

Concurrently with our pressing a Bill of this sort, a society called the United Society of Chemists and Druggists was brought together by a Mr. Buott, who was the active organiser. This man thought we were making a great mistake if we wanted to make the trade, as it was called, a close profession, and accused us of interfering with free trade, and he conceived the notion of getting a number of people to join him. Now, mark you, those were chemists and druggists who were saying, "You are going to interfere with free trade," and we said, "That is exactly what we are here for, to interfere with free trade." They replied, "Oh, no. We don't want anything of the kind. We want freedom of trade on the one hand, and we want restrictions on the sale of poisons on the other, and we think that is enough for the drug trade at the present moment." They carried out their views by submitting to Parliament in the year 1866 a Bill which was simply a Poisons Bill. These two Bills—the one promoted by my Council and the Bill promoted by the Committee of the United Society of Chemists and Druggists—were referred to a Select Committee in Parliament. A lot of evidence was taken of the squabbles between the Pharmaceutical Society, on the one hand and the United Society of Chemists and Druggists on the other, and their differences were so striking, that the Committee of the House of Commons, as you could well understand, felt rather sick of the whole business, and did not know exactly how to get out of it. They got out of it by saying they had taken evidence, and were of opinion that there should be legislation on the sale of poisons. That is as far as we got.

Now I want you gentlemen to notice that in these unfortunate circumstances, although we on the Council of the Society had offered membership of the Society in its entirety, to every person engaged in business, and various other things of the kind, there was still this objection on the part of the trade at large, to our going to Parliament for what they called

interference with free trade in their business. We did not propose to interfere with free trade at all. We proposed to register every person in the trade, and every assistant when he became of age at twenty-one, and we went so far in our liberality as to say that even registered apprentices had a sort of vested interest in our trade and we would register them. We were opposed, gentlemen. We were supposed to have something up our sleeves. We were not considered capable of taking a broad view of the life of the chemists and druggists throughout the country. We were supposed to be a few West-end of London people living in the lap of luxury, and having no sympathy with the chemist and druggist. You know, gentlemen, that I am a working chemist and druggist as well as yourselves, and there never was at any time, nor can there ever be, any difference between one registered man and the other. We are all affected by whatever takes place in legislation, and it is absurd to talk of what is good for one man not being good for another. Well, gentlemen, we were met by this difficulty of free trade. The notion was that we were going to convert what had been the good old-fashioned business of chemist and druggist into something that was new-fashioned and a little professional, and that we were going to do harm. Some of this bitterness arose no doubt from the fact of the great difficulty in arranging on what terms the chemists and druggists in business should come into the Society. There was a little ill-feeling engendered by the fact that, on the one hand, certain men who had passed the Major examination and had got the title were not disposed to give up that title to everybody else, and, on the other hand, there was a disposition on the part of some, including myself and others, to deal broadly and as we thought loyally with everyone who was engaged in business. However, that was the result. The opposition practically defeated the principle for which the Council of the Pharmaceutical Society had gone to Parliament, because they simply said, "We only want poisons dealt with."

Well, Mr. Sandford, with very great courage, admitting the difficulties of the situation, thought it better to take half a loaf than no bread, and he set to work with the Council to draft a Bill to try to come to terms with the United Society of Chemists and Druggists as to what we could agree upon and go to Parliament with them. In the course of 1867 we came to terms, and in 1868 we went to Parliament, and the present Bill, with one important difference, represents really what the original Bill was. The difference was that our Bill, before it became law, provided in the most generous way for the rights of everybody connected with the trade in its widest sense, including apprentices. But when we got into Parliament the Privy Council came upon the scene as representing the Government, and said—"No, no; nobody under twenty-one may pass the examination; that is necessary for the safety of the public." So there was this objection to assistants who were not in business at the time of the passing of the Act, and for a long

time we had a difficulty in getting the Privy Council to agree to what is known as the modified examination for those men. But the Pharmaceutical Society, I consider, did not, on the whole, deal with the trade unjustly or unfairly with regard to these educational matters. It is right that apprentices and right that assistants should be registered. And, having once come to that conclusion, and having finally, when the Bill did pass, registered everybody in the kingdom for nothing—a piece of generosity which I venture to say no other corporate body ever did in the course of its existence—I think I may claim that the Pharmaceutical Society has never been very hard on the trade. That is practically the history of the present Act.

Now this brings me to refer to the defects of the Act. What are the defects of it? In the first place a serious defect is, it does not provide for a trained apprenticeship, the training of the pupil before he goes up for examination. And when I say that, I mean it seriously. I mean it is a disadvantage to the youth who goes up for the examination that he has not been given a proper pupillage or apprenticeship and gone through a short course of training. I say not only is it a positive disadvantage to him, but I conceive that a chemist and druggist in business, whether only three or four-and-twenty or four-and-seventy, is damaged in his personal relations and in his pocket by having men coming into his craft on the result of a mere "oram" examination. That is what I say. The engineers in this great city of Glasgow, shipwrights, and others, never admit anybody into their body before he has passed through a long course of apprenticeship. They produce a skilled man; and they do not say, "We want to put a restriction upon the trade, not because we have an objection to compete with men who are capable, but we object to compete with men who are not capable; these are the men who do bad work and bring our trade into disrepute." And so in pharmacy. Those are the people who are likely to be led away by mere trade considerations. And so I prefer proper training. I think it is politic, and a safeguard for ourselves and the birthright of the pupil. I think that it is cruel for any of us to take a pupil and make use of him—to take him, for instance, as I am told is sometimes the case, more as an errand boy than as an apprentice, to use him for ordinary work which can be performed by anybody—and then after two or three years suggest that, for a consideration, or rather a reduced payment in weekly or other stipend, he shall prepare himself for becoming a chemist and druggist. I know such cases in this city and in a great many other cities. I know a good deal, of course; I see examination papers, and I see statistics, because these unfortunate people, lost, benighted as they are, have been weak enough to get me to preside over the Board of Examiners for many years. I am afraid I have got to know more than I ought to know, and I do know this, that some of my weaker brethren—I do not use the word in any unkind sense; I mean to say those who have not the backbone I should like to see in every chemist and druggist—

who are thinking of their balance from morning to night, counting their shillings and wondering if they can open their pharmacy to-morrow, are often suffering from a species of nightmare.

I know of nothing more capable of making a man miserable than for a chemist and druggist to try the daily process of considering exactly where he is. Well, I say that for the man who is doing a comparatively small business, struggling for an existence and wanting some assistance, there is, no doubt, a strong temptation for him to take that which will cost him least money. But I want to put it to you, if he does that he is preparing for himself a little rod which in a few years may be the means of taking away his own business from him. A man may, indeed, get through the examination, but he won't have much training. He won't have much sympathy; he adopts, the first profession which presents itself to him, and he has not been educated before the age of fifteen or sixteen for the work of his life, with the result that he is a hermaphrodite. He is neither one thing nor the other; and such persons are those who are least scrupulous in their consideration for their brethren who are brought up in the regular course of trade. I justify proper training of apprentices and future chemists and druggists on the ground of advantage to the man himself—that is, the pupil—and on the ground of pecuniary advantage in the long run to every registered person. For these reasons I think, therefore, it was a mistake not to have provided for them. And when I say it was a mistake, I may say that my friend, Mr. Sandford, when alive, always had the impression that our powers were sufficient for that purpose, and he contemplated later on that a definite course of training would be imposed.

You will say, "There is no certificate required for a three years' training; and how are you to get over that?" I am sorry to say the clause of the Act is so carelessly worded. I did not see it when it was drawn up, therefore I am not responsible for it. The Act does not give us legal power to impose that particular form of training, nor does it give us legal power to require anything more than the broad statement that a man has been engaged for a certain number of years in the writing and dispensing of prescriptions, and that is such a very vague thing; it may be in a doctor's shop, it may be in an infirmary, or in a closed surgery kept by a doctor, or anywhere. I do not mean to say it is ridiculous, but I mean that it is so worded that we have no power to refuse a certificate of this kind for work done, whether it is done in the pharmacy of a registered chemist and druggist or not. My point is that a man may be trained anywhere away from a chemist and druggist, and if you only get a certificate to this effect, we are bound to examine. And I am bound to say that is absolutely worthless. The certificate issued is worthless for the purposes of any evidence of training. I should like to have that certificate real. I should like to have every person producing a certificate of at least three years' training with a registered chemist and druggist. I do not consider that

a doctor has the means of teaching a pupil, and therefore I think he should be with a registered chemist and druggist. If a registered chemist and druggist has time when dispensing in a public institution, I see no reason why he should not take his pupil there and teach him. But it is perfectly absurd to suppose that there is nothing in pharmacy at all. I hold there is a good deal in it.

It is perfectly absurd to suppose that an ordinary course of work in a doctor's shop can give him what we consider a proper training, and therefore I should like to see it done away with. You know the exclusive right I mean by that. The right to dispense prescriptions, you know, was one of the principal features of the Pharmaceutical Society's Bills both in 1852 and 1866, and the Irish pharmacists have got it. Every country in the world, including Canada and every division of the Australasian continent, has it, and I am sorry to say that in Great Britain we have not. I submit to you that the skill and knowledge required for the dispensing of prescriptions containing things not in the Poisons Schedule requires as much care for the safety of the public as the dispensing of a dose of morphine or opium, and that the whole thing is ridiculous in its present form. I believe if we could only get a hearing in the House of Commons on this subject we should achieve our point in regard to that. I do not think at the present we can go further than that, but I do think that the compounding of medicines generally—the putting together, in definite quantities, of different things of more or less potency—is a thing that ought to be—and every physician in London and every educated man I have spoken to thinks it is a thing that should be—restricted entirely to chemists and druggists. I do not mean that doctors are to be debarred, but I mean to say if it is right that the dispensing of a mixture containing a tenth of a grain, a twentieth of a grain, or a quarter of a grain of morphine with other things should be done by a properly trained man, it is quite as important for the safety of the public that extract of henbane and all other poisonous things—antipyrine, and all those things with composition unknown to us, which may be poisonous—should be dispensed by the same person.

Of course, there are certain other things we have to deal with that are matters of internal regulation. Mr. Currie has referred to one, and I will now refer to his observations. Mr. Currie says every person who is in business on his own account, and who has passed the Minor examination, should have all the privileges of membership of the Society. Gentlemen, I am not a strong politician of any sort, but I confess that for many years I have advocated this. I consider that it is a right thing, and, what is more, I consider that we went wrong in 1868 when we did not make it so. It may be some satisfaction to you to know we actually so intended it to be. In the first instance, when the Bill was drafted, the clause dealing with this subject read—"That all persons after the passing of this Act who are duly registered as chemists and druggists, and who shall, hereafter pass the Minor

examination, shall be eligible to become members of the Pharmaceutical Society. But I am sorry to say that some of my examining friends of my own age were so strong in their opposition to this clause that we were obliged to give way. Parliament was about to be dissolved, our Bill was in the House, and you know how little opposition will sometimes kill a measure, and we were obliged to accept that very dangerous thing—often a very necessary thing all the same—a compromise. We had to say: "Very well; every chemist and druggist in business at the time of the passing of the Act shall be a member; there we will stop if you are content, and every Minor man shall be associated." You will observe, if you read that section carefully, we gave the Minor man as nearly as possible all the privileges of membership excepting the name. We gave him voting power, but he must be in business.

Well, that was a compromise, and I know it was much to the regret of Mr. Sandford that the clause was altered in this way. My only apology to you for having to explain it after so many years—twenty-five years afterwards—is this, that I had to deal with it at the time, when perhaps I was the only examined pharmacist on the Council. I was by far the youngest member on the Council. I was a kind of whip, and I found that the men about me who objected on this point were men of considerable influence. They were all of them well-wishers of the Society, and had a notion that when once it was necessary for a man to pass the Minor examination, he would, almost as a matter of course, go up for the Major. We had conceived the notion that every chemist and druggist would feel that he must in some way, as a matter of aspiration, go up for the Major, and in that way probably no great harm would be done. I tell you frankly we were all wrong, and Mr. Sandford perfectly right. I am one of the wrong-doers, because as a matter of expediency I was obliged to vote for this alteration, in order not to lose the Bill then in the House. Those of us who belonged to the young examined class at the time were disposed to sacrifice anything for the good of the trade, but it was impossible for us to compel our older brethren to do the same.

That is one excuse for what I consider to have been so far an imperfect bit of legislation as regards the constitution of the Society. And some excuse is probably to be allowed to us because there had been a great outcry, a great desire, that every person who was in business should be made a pharmaceutical chemist straightway. There were many of us, including myself, who would not have objected to that, but there were difficulties, as all of you will see; and I think if any of you choose to think over what I have said so far, and consider the difficulties we had—an unsympathetic trade tacitly helping us but really thinking that we were playing the fool, crying all the while for free trade which might be taxed, poisons, and every sort of sundries and outside things, and caring little for what we chose to call pharmacy—I think you will see we were in a very difficult position.

And what do we find now? You will find that those men who opposed us are the persons who now cry out more and more for protection. And those are the persons who write to me, as your President, clamouring about the rights of protection, and who, I venture to think, would have been much worse off even in Glasgow—if there are any of them, and I dare say there are—than they are now if that little bit of legislation had not been passed.

I say, defective as the Act is, it has prevented some of us from having been absolutely swept away in the fierce competition that is going on. Lastly, the Council has drafted Bills—Mr. Currie cleverly says that it is rather slow in moving. By the Council, I think he means, not the Council of this Association, but the one which I have the misfortune to represent here to-night. It is quite true, but so long as both Scotchmen and Englishmen will consent to allow the whole time of the House of Commons to be absorbed by questions affecting Ireland, what can be done? I say nothing about politics, but that is a broad fact. We have been told over and over again: "Ireland blocks the way" to private legislation; and Irishmen meanwhile can go in and get their Act, and get exactly what they want, including the compounding of prescriptions. But we in Great Britain are left out in the cold. Of course, if Mr. Currie wants this particular part of his work done as well as others, I think I shall be able to tell him presently that we must not only have an opportunity for getting what I call domestic work done in the House of Commons, but work that affects a large number of us very materially, and will be looked upon as much more important in the colonies than the question of the particular government of a particular neighbouring State under particular conditions.

When we get that chance I hope we shall be able to do something, and it is not our fault that we are under this condition of things, and that our little Bill gets pressed out; because, gentlemen, there are people interested in keeping things as they are. There are people engaged as chemists and druggists who do not believe in the Pharmacy Act of 1868, or any Pharmacy Act—who do not consider that it is right to be fettered or bothered by legislation of any sort, and, although on our Register, they are at heart directly hostile to any progress which will benefit the general class of chemists and druggists. Associated with those men are wholesale men who are equally interested indirectly in this sort of proceeding, and we have in our own ranks material opposition which, the moment the President of the Pharmaceutical Society gets into the House of Commons, is put before him with very strong and very cogent arguments. You have people who tell—indeed, they are on our Register—that it is all an absurdity, and that the best thing for the public would be free trade in drugs and medicines. I have at my back a motley group of men—an increasing number, I hope, in Glasgow—a comparatively small number in the whole of Scotland. I have at my back, as President of the Society, a very fair number of registered men in England, but out of that number I stand probably in the

position of having one-third behind my back, and two-thirds not within the fold. I mean behind my back are the men who can be trusted to support the President of the Council. What can I do in those circumstances? Whom do I represent? Do I represent the registered chemists and druggists of this country? Does my Council represent them? I do not. I point to a career of unselfish devotion to the interests of the public and of my craft. I show that we have not been sleeping, that we have encouraged education in the broadest sense; we have been liberal all round and promoted education. We have done all these things, public acts which, in the eyes of the House of Commons, bring recognition of good work done. I bring all these things, and then comes this question, "You do not represent every chemist and druggist." That is not the fault of the Pharmaceutical Society, gentlemen.

Then the last defect as regards ordinary matters that I should like to see remedied in a new Bill would be the right to strike off from the Register persons who have been guilty of misconduct. You know what mean by misconduct. I mean serious misconduct and crime. It is an astonishing thing that we have not that power. I cannot understand why. The only power that is reserved for misconduct is a most curious one, but the clause was put in by the legal adviser of the Privy Council, and he took care, as we did not seem to want to strike them off for misconduct, that the Privy Council should have that power. I am bound to tell you we thought we ought to have that power, and we willingly assented to it; but we had a number of men almost opposing us, and who were only pressed into a kind of acquiescence. We daren't raise too many difficulties in regard to matters of this sort. But in the passage of the Bill through the House the Privy Council insisted that if a person failed to conform with the regulations in regard to the sale of poisons under the 17th section, it should be within the power of the Privy Council to strike him off the Register. So they took care that there was a power behind the Council of the Pharmaceutical Society to strike a man off. It does not apply to a person unregistered; but if a man went on selling poisons, he being registered, and did not label his poison nor write up his poison book, and that thing went on for more than once or twice, then there is power to strike him off the Register. But for offences which we are much more likely to come across, and of which, it seems to me, all registered persons are bound to take cognisance, we have no power at all. But we are bound to have that power. I think you will agree that it is a right power. Not the power of going into little petty things, but, in a broad sense, misconduct of a certain kind is misconduct which we all understand, although undefinable in terms.

Then, Mr. Currie, your president refers to that great bugbear of the present time, a bugbear not only affecting us, but affecting every person engaged in retail business, namely, company trading. He says, and very rightly, that it seems an anomaly that seven persons, making themselves into a corporation by payment of a small sum of

money, should be able to do what an individual cannot do; and, further, I am sorry to say he hits me very hard when he brings it up. Well, I am sorry to tell you that it is the fact that all corporate bodies are outside the Act. It is a fact, and it is the law. It is the law because it has been decided by the House of Lords, and it will be the law until it is altered by special enactment through both Houses of Parliament. It is no use crying. It is the law, and it is no good abusing the Society. The question is—Having got the law, can we alter that law, and if so, how are we to do it? I have from time to time referred—I think I referred to it the last time I was here—to the difficulties about the "Widows' Clause." I was one of those who in 1866, when the present Act was in draft, I was one of the few members of Council who opposed that "Widows' Clause." I hold that you cannot transfer the personal qualification of the individual to the widow or her children or a corporate body, or anybody else, and by having a clause of that sort you are simply throwing away your birthright. For you are personally qualified, or you are not. What was the answer? A defeat. For the whole Council, men double or treble my age, said, "This is a very inexperienced young man, and we must sit upon him. He wants pharmacy to be a profession."

That is what we hear going on now. I ventured to say then, as I say now, "I do not care what you call it; if you ask me to go through a course of training and be at certain expense to become qualified, it is hard lines to allow somebody else not qualified to be in the same position as I am." But it is asked, How is a man to dispose of his business? and, What is to become of the widows? I venture to say that that is an illogical and a contemptible argument. Of course, I do not use these words in a personal sense, but I think it is a weak argument to use that a person when he dies cannot—or rather his executors cannot—get a fair value for the business, and that it is therefore better for the widow and her children that this business should be carried on for her; that the realisation of the little business would bring, we will say, if sold, a small sum of money, but if carried on with care by some other person at a salary—which, as we are aware, in those days was not very high, and is not and not likely to be regarded as very high at any time—it would support the widow and the children being brought up. When a man talks about his widow and children he begins to play the fool—logic goes away at once. That is what happened here; and I and another gentleman, I believe, earned the reputation of being the two most hard-hearted persons that ever existed, and as we were both unmarried we were supposed to know nothing about the subject, and were sat upon accordingly. That was *in camero* and against the Bill. It was pointed out, and rightly pointed out, that the whole trade would be against us. It was true. The whole trade was in favour of that clause; there is a large part of the trade in favour of that clause now.

I believe the majority of the registered persons in business are so illogical at the present moment, that if a minister were to say to us, "Gentlemen, we see the danger to the public when a person dies that his business should be handed over to his widow or his executors, will you give it up?" I don't believe if I appealed to my brethren throughout the country I should get an affirmative answer from the majority. I don't believe I should, and at the same time those gentlemen wish us to check the companies. The law of company trading in regard to chemists and druggists is laid down in the decision of the House of Lords. A legal case was fought from one court through four courts, right up to the House of Lords, and the final decision was given on this account that we, the authors of the Bill, and Parliament as approving of the Bill, had held that, in the case of a widow, a registered person might carry on business, but nothing was said about corporations, and that if corporations got registered persons to carry on their business they did not see that the danger to the public was greater than if a widow, as owner of the business, carried it on. Now, gentlemen, are we so blind as not to be able to see that whatever we think of the judgment, there is something like reason even amongst the law lords who took that view. I think that "Widows' Clause" was the cause of our defeat in company trading—our own clause. The weakness—the want of masculine character—in the men who had charge of the affairs of 1868, coupled with the apathy of the trade at large, was the cause of our defeat. They would not do one thing or the other. They were free-traders in one thing, and yet they were for a certain sort of restriction, but the moment you said, "What is going to happen when you die?" away went logic and principle. "Let some one carry it on for us," they said.

That is the condition of things regarding company trading. My difficulty is to know what to do. I believe it may be possible to deal with certain forms of companies we are in the habit of calling bogus companies. I am not speaking of big organisations like what, I daresay, you have in Glasgow and we have in London, with a large number of regular shareholders, and so on. What we mean is a huckster or a man who calls himself a grocer, and does that which a chemist and druggist does, and who, when we, the Council of the Society, take proceedings against him, takes in his sisters, his cousins, and his aunts, to the number of seven, and makes himself a corporation. Apart from the question affecting us chemists and druggists it is, a scandal in any case. I do not hesitate to say there may be in the near future a chance of doing something in that particular direction in regard to the formation of such bogus companies, on the broad issue of how far we can persuade Parliament or the Privy Council that if we are to have our businesses carried on by our widows or our executors or trustees, it must be by registered persons. If we want that I say we cannot ask for the other, and if we ask we simply won't get it. That is the thing that a chemist and druggist has got to make up his mind about. His bread and butter are being

taken away, and I sympathise with him deeply. It is a scandalous thing; but I do to some extent excuse the law, because the trade at large actually prepared the very thing which is now the instrument by which our own backs are being lashed, and we suffer accordingly. But what I cannot understand is this. You remember when I was last in Glasgow I had been talking about a draft Bill that was before the Council. I referred to it then and pointed out, as I do now, that I was sorry to say the great majority of our registered brethren will not have that "Widows' Clause" altered. Until you consent to have that "Widows' Clause" altered or dropped you cannot come with any logic to Parliament and ask it to make alterations in the company law.

I hope I have been plain enough, and I know you in Glasgow like straight speaking. That brings me to the question that was put by Mr. Currie as to the view that if this sort of company trading goes on there is no encouragement to impose a curriculum or apprenticeship upon a pupil. I wish to point out that two wrongs do not make a right. There is one feature of this subject which impresses me. That is that there is only one way, until we get fresh legislation, that we can deal with these companies. That is by the personal qualification of the individual who keeps his own pharmacy. I submit to you that if a man has had a decent training and you put him into a pharmacy in Glasgow, and he attends to it and shows his intelligence, his chances of getting an honourable living are immeasurably greater than if he had been trained in a doctor's shop, and then simply shot through an examination.

I need not say to you rich people in Glasgow that the whole difficulty we are suffering from retail business is from the fact that we have too much money. We have too much money in the country. We cannot get $1\frac{1}{2}$ per cent. for our money in any ordinary bank or any other concern. Money is practically so plentiful, that it is not worth investing in the ordinary sense of the term; you might as well put it in a stocking—I mean if you want to be quite sure of it. And the result is, banks and corporations and others whose business it is to collect money are ready to lend money for any purpose—retail trading, cattle trading, or any conceivable thing under the sun—and we in London have to compete with people who are being financed by getting the whole of their capital from the city banks at the present moment, because they do not know what to do with their money. They probably regard us as about the weakest set of mortals going. And it is true. We cannot agree about many things; still, their hand is against everybody. And with this immense onslaught of capital against the individual, who is able to fight capital under such circumstances best, the trained or the untrained man? I submit that the trained man at the present moment who attends to his own business is most likely to hold his own, if not to beat even large stores in the conduct of the business of pharmacy. And it is, therefore, wise for us to do as much as we can ourselves. If we cannot afford to take people as our pupils who have

the necessary education to pass the Preliminary and become decently trained chemists and druggists after on, let us do without them. Let us have a porter, an errand boy, or a woman. Let us stick to our own business; let us shut up our pharmacy and do as lawyers do, put up the notice "will be back at 10 o'clock." Let us make the people feel that we personally are wanted, and I venture to think, even in Glasgow, despite doctors' shops around you, you will be respected by everybody about you if you are able and willing to do that sort of thing.

In regard to examinations, we have shown by the appointment of scientific men as examiners that we are desirous that the examinations of the Society both in Edinburgh and London shall be of such a character, that the man who has learned his botany or chemistry anywhere can get an examination which will be least liable to the observation that the person who examined him in the subject is probably too well known in it, or too technical, or expects too much to appreciate what he knows. You know as well as I do that the difficulties in life in regard to examination depend very largely upon your being able to place yourself in the position of the student. I have been in the habit of saying from time to time that I believe the President of the Pharmaceutical Society could make it very inconvenient for any registered person at the present time to pass an examination in any one subject of the Schedule. I mean to say he could talk, and cross-examine, and sit upon the candidate, and in the process I think he could effectually "pluck" him. I say that for myself. Perhaps I have done that sort of thing in the course of my time. I may have done it. I have not done it knowingly, but I dare say I have. I plead guilty to the possibility of being as much a sinner as any person engaged in pharmacy who is not at the same time engaged in teaching chemistry and botany to students. It seems to me to be the right thing for us, although some of our brethren might think it a little bit uncraftsmanlike, to call in external aids.

Still, I think you will agree with me that no person can judge of what is an ordinary knowledge, an elementary knowledge, of such a thing as the science of chemistry and the science of botany, as can those who who are teaching it day by day, and who know what an elementary knowledge is at the particular time and the particular phase of the science. As we get older and more experienced we—the men engaged in pharmacy—get disposed to examine in the applications of the science rather than in the science itself. It seems to me that teaching should go hand in hand with examining in those two subjects, and I am sure that you cannot feel that our certificates will be any worse if we can induce, as I have reason to believe we shall be able to induce, eminent men engaged in teaching those two subjects here in Scotland, and in England, to undertake the duties of examiners. Nor do I think my colleagues on the Board of Examiners will themselves do otherwise than receive those gentlemen with the consideration they deserve, and with the desire to

make the certificate, if anything, more worthy of the men who in future receive it.

It was quite impossible for me to deal with the challenge Mr. Currie throws out without giving you a slight history of pharmacy. You will see from what I have said that I consider that the present pharmacy law is defective in many ways. I have told you perfectly and in a friendly manner, but at the same time most frankly, in what way I think the law should be modified and altered. I have spoken my mind clearly about company trading and the "Widows' Clause," and I leave it to you and such as you throughout the kingdom to tell us at Bloomsbury Square what you would like us to do. I have attended now for nearly thirteen years to your presidential duties; from the age of twenty-two I have been an officer of the Society, working continuously for it. I hope I have done my best to be loyal to every man, whether connected with the Society or not, but I tell you plainly, gentlemen, that I will not, nor will my Council, move in the direction of trade matters in the House of Commons—though we may go in for some matters of internal arrangement—until we are assured of the support of the trade at our back. And we are, I think, entitled to ask for that, and we cannot listen to any criticisms or any grumbings from any of you until you distinctly lay down and agree amongst yourselves what you will go for. And when you have done that I ask you to support us loyally. I cannot ask all of you to join the Pharmaceutical Society—at least, I can, I think it would be a good thing if you would, if there are any here who do not belong to us—if I, however, cannot ask you all to join the Society, I can at least ask a majority of the trade to enrol itself under the banner of the Society. The question of finance is not a very serious matter, even at a guinea a year. The important thing we want is not your guinea, it is your support, it is your power; it is that power which every man who is working in the various branches of labour is using with great force at the present moment in the government of the country; and you chemists and druggists are lying outside and being beaten by them in the race, and beaten because you will not rally round, as I conceive, the only organisation which will do any good for you. You will not, I venture to say, in regard to the "Widows' Clause" be perfectly logical, and as long as you are in that difficulty it is impossible that even the speaker who is now addressing you, and who is a good deal older than he was thirteen years ago, can do anything for you unless you support him. Give him and his Council the support of, say two-thirds of the trade, and I will undertake to say we can do something for you. With these words, I beg to thank you all.

Mr. Robinson said he had been selected as one of the vice-presidents to move that their very heartiest thanks be given to Mr. Carteighe for the address he had given them. He remembered when he went to the trade sixteen years ago, the first document he saw in the pharmacy was one signed by Mr. Carteighe, and at that time and for many years subsequently it seemed

to him that Mr. Carteighe and the gentlemen whose names followed were something very little lower than the angels. That was the first opportunity he had had of viewing him in terrestrial substance. He had been anxious to hear what this head and forefront of the Pharmaceutical Society really had to say with regard to the many grievances they had had to bring against him. He must say he was perfectly convinced there was a spirit of absolute unanimity underlying all external differences which they had with the Pharmaceutical Society and its Council; that their objects were the same all through, and that the opposition which was supposed to exist was entirely visionary. He fully believed that if the chemists and druggists were polled that day upon the subject of whether they would have bogus pharmacists or widows carrying on business, he thought not two-thirds, but ninety-nine one-hundredths would say "Away with the widows; let us have genuine pharmacists." He thought pharmacists should endeavour to make enough to keep their widows in case of decease, or in some way provide for them by insurance, so as not to deteriorate the tone of their profession, and so that those who came after would not have those bogus companies to contend with. He believed the points put before them had been admirably met, and Mr. Carteighe had devoted a considerable amount of attention to give satisfactory explanations. He had very great pleasure, therefore, in asking them formally to accord him a very hearty vote of thanks.

Mr. Boyd said he had listened with very great interest to the historical sketch of pharmacy so very ably given by the President, and thought they owed him a very great amount of thanks indeed. He had come there that night at the cost of a great deal of inconvenience, on purpose, no doubt, to encourage them in the work of reform. It was earnestly to be hoped his practical remarks would bear fruit, and that in the future they might be more united when they sought further legislation. He thought that when they were going to Parliament again, before the Bill was drafted they should have a grand conference of the trade [Mr. Carteighe: Quite so!] The Pharmaceutical Council was composed of admirable men, but there was a great deal of the metropolitan spirit about them, and the provincials might think they were not in sympathy with them. He was sure that if they were all united and held a grand conference of delegates from all the associations at some central place, there would be more likelihood of a better Bill being produced, and more likelihood of its being passed. He had much pleasure in seconding Mr. Robinson's motion.

The Chairman then said he thought they ought also to accord a hearty vote of thanks to Mrs. Carteighe for the honour she had done them in gracing their meeting that night. They had also another distinguished guest in Mr. Bremridge. They all knew his name well, and he hoped that none there would have any but happy reminiscences of him and that meeting.

The motions were unanimously agreed to, and the votes of thanks accorded with great enthusiasm.

In acknowledging the votes of thanks, Mr. Carteighe said it was very kind of them, and really quite refreshing to meet with so much enthusiasm. He worked and talked, and sometimes wrote, and it was quite delightful to hear a good cheer of that sort. It augured well for the success of the Association, to which he desired, on the part of his Council as well as himself, to tender their heartiest good wishes. He knew the special difficulties under which they worked in Glasgow, apart from bogus trading, and he thought they might give the Council credit for showing that

they had not lost sight of some means of attempting to alleviate the difficulty that had occurred. He thought, perhaps, the difficulties of what were familiarly called "doctors' shops" were not quite so great as they were some time ago. At all events, if they had done nothing else for Glasgow than this, he thought it was something to their credit that they had shown that a doctor cannot do what a registered chemist and druggist cannot do—that is, he cannot leave his pharmacy to a person unregistered to dispense and sell poisons. He thought that was a point, although it seemed a small one, that would tell in favour of pharmacy in Glasgow. He felt certain that it was only from want of knowledge on the part of the people of Glasgow that things were as they were, and he felt certain that the intelligent people of Glasgow, if once they understood this question, would support the chemist and druggist right through. They would see it was the right thing to separate the dispensing of poisons from the prescribing of remedies and visiting the sick.

For himself he might say that, although it was perfectly lawful for a medical man to keep open shop anywhere—for he could not help thinking that a medical man was privileged by law, and did not wish or claim that that right should be taken away from him—he was doing himself much harm and doing the registered chemist probably greater harm, and he believed the practice was one which was condemned by the leading men in medicine in every country, as well as by intellectual men generally. The proceedings which had been taken, and the appeal to the High Court of Justiciary in Edinburgh not very long ago would, he thought, effect a material change in the relationships between doctors keeping open shop and those they employed, and further he thought he was right in saying that the faculty of the College of Physicians and Surgeons had practically agreed upon, and in somewhat delicate terms pointed out, the importance of their graduates conforming as much as possible, not only to law, but to a certain code of ethics which was referred to in some gentle terms, but which he thought showed plainly what they thought of the whole thing.

At the same time it was for the pharmacists in Glasgow to do all they could to show those doctors that they were doing their business well, to do all they could to conform as much as possible to the law themselves in regard to the sale of poisons, never to omit precautions required by law, because if once it were to become known that any one of them was in the habit of even accidentally omitting to carry out the very law under which they were registered, they would give a handle to doctors to say they were superior persons, and could carry on their business with care and safety. They would see what he meant. With regard to his excellent friend, Mr. Bremridge, of course, next to hating the President they probably hated him, most because he was one of those inconvenient people who asked for money periodically, and he did not wonder that they looked upon him as a bit of a persecutor, but he had thought that if Mrs. Carteighe was allowed to come in with the Secretary probably they might between them have salvation.

Mr. Bremridge said he was not going to inflict a speech upon them, but after the very kind reception of his name, he should just like to say how much obliged he was for the cordiality of the welcome they had given him, and that it was a very great pleasure to him to have an opportunity of attending a meeting of their Association. He added that they had his best wishes for the continued success of the Association.

The proceedings then terminated.

Parliamentary and Law Proceedings.

PROCEEDINGS IN THE COURT OF CHANCERY.

IN *re* MANDALL'S PATENT, No. 6178 OF 1893.

In the High Court of Justice, Chancery Division, before Mr. Justice Romer, on Monday, the 3rd inst., Mr. Wallace applied that this matter might be placed in the paper as a short cause, the respondent having intimated that he did not intend to further oppose the petition. His Lordship directed that the petition should be in the paper on the following morning.

When the petition came on on Tuesday morning, Mr. R. Wallace said: My Lord, this is a matter which your Lordship allowed to be put in the paper to be taken as a short cause; it is a petition for the revocation of Letters Patent granted to Edward Mandall, of Tower Works, Stockton-on-Tees, for a new and improved utilisation of liquorice and other ingredients for the manufacture of certain medicinal compounds. Then certain ingredients are specified, and the claim is for the utilisation of liquorice and other ingredients for the manufacture of certain medicinal compounds, substantially as described for certain purposes. The petition is presented by the Pharmaceutical Society of Great Britain, and leave to present the petition was given by the Attorney-General, the Pharmaceutical Society having no *locus standi* without this leave, under section 26 of the Patents, Designs, and Trade Marks Act. The particulars of objection attack the description of the patent, and also allege that this is not subject matter for the granting of valid Letters Patent; also that this invention was anticipated by certain users. My friend Mr. Bonsey is instructed to consent, and I ask your Lordship for an order that the patent be revoked, and that the respondent be ordered to pay the petitioners their costs of the petition, and, consequent thereon, to be taxed by the taxing master.

Mr. Brodriok: My Lord, I appear for my friend Mr. Bonsey to consent to the petition being revoked. On the question of costs, I don't know whether your Lordship will give costs of obtaining the fiat of the Attorney-General in this matter.

Mr. Justice Romer: They are entitled to their costs.

Mr. Brodriok: Yes, my Lord, but I do not know whether your Lordship will give the costs of first obtaining the fiat of the Attorney-General before the subsequent matters took place.

Mr. Justice Romer: Have I to go into that?

Mr. Wallace: All I ask your Lordship for is an order that the respondent pay the costs. This question will be dealt with by the taxing-master.

Mr. Justice Romer: Yes, the taxing-master will deal with that.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

ADULTERATED TINCTURE OF RHUBARB.

At the Chesterfield County Petty Sessions, on November 23, Mary Remington was summoned for unlawfully selling at Staveley, on October 22, tincture of rhubarb which was adulterated with 20 per cent. of water was deficient in saffron, and not of the nature demanded. Colonel Shortt gave evidence as to the tincture of rhubarb being very much below strength. Defendant, an old woman, said she did not know anything was wrong with it. Colonel Shortt did not wish to press the case; he would be satisfied with the costs. The bench ordered defendant to pay the costs.—*Derbyshire Times*.

POISONING CASES AND INQUESTS.

POISONING BY CARBOLIC ACID.

Emma Robins, aged 27, died at Southport on Sunday, November 18, from the effects of carbolic acid, self-administered. Verdict, "Suicide while of unsound mind."—*Liverpool Post*.

CHLOROFORMING CHILDREN.

Margaret White was sentenced to three months' imprisonment at the Sheriff Summary Court, Edinburgh, on November 28, for ill-using her children, aged 6, 8, and 12 years respectively, and drugging them with chloroform.—*Glasgow Echo*.

DEATH FROM AN OVERDOSE OF BELLADONNA.

G. L. Murgatroyd, of Middlewich, died on Sunday, November 25, from the effects of tincture of belladonna taken medicinally. Verdict, "Death from an overdose of belladonna."—*Liverpool Courier*.

POISONING BY LAUDANUM.

George Powers, aged 52, died at Norton Woodseats, near Sheffield, from the effects of laudanum, self-administered. Verdict, "Suicide during temporary insanity."—*Sheffield Independent*.

Correspondence.

SIMPLE LABEL CASE.

Sir,—Sometimes little hints are useful, and the one I suggest is useful for keeping dispensing labels clean. Cardboard cases, such as are supplied with address cards, are procured the size of labels, one of which can be pasted on the outside of box. An elastic band is passed round the labels, and the bundle slipped inside the box. As each box usually consists of outer and inner cases, it will serve for two lots of labels.

Sheffield.

G. ELLINOR.

DEATH OF A FOUNDER OF THE SOCIETY.

Sir,—In the person of Mr. Wm. Hooper another link with the past has gone, and as one who owed him much, I think the present a fitting occasion to offer a tribute of respect and affection, in which my present partner, Mr. Rundle, most sincerely joins. Just seventeen years ago to-day, in conjunction with Mr. Rowe, it was my good fortune to succeed him in the business, which, without affectation, I can say he loved, and from that time till now, notwithstanding his great age, his kindly interest in it has never ceased. He not only sold us a business, but he gave us ungrudgingly his experience, his advice, and his time for years after, and as from time to time we were privileged to visit him, up to the last he cherished a deep interest in his old pharmacy, and never let us go without enquiries concerning methods of preparation of those articles of the Pharmacopoeia in which he took interest, and concerning which his memory at 90 was greener than that of many a minor candidate. He was devoted to pharmacy and had a passion for the best; nothing short of it was good enough for him. I remember almost a quixotic incident showing this: When a question arose of buying cheaper coals for the laboratory furnace, "Sir," he said, "nothing is too good for my laboratory." I had met many good men in pharmacy before I knew Mr. Hooper, but never one who more commanded respect; he belonged to that age of self-dependence when individual ability, integrity, and strength of will could carve their way to position, and stand out strengthened by the obstacles they had overcome. Always courteous to others in the grand old style, he never failed himself to command respect. For forty years he conducted the business at Russell Street, which under his close personal care grew and prospered, and the respect and trust which those forty years had gained for the name and reputation of his business was a revelation to me. Like most strong men, he could afford to be generous, and no assistant that lived with him worthily but found at Christmas time something more than was in the bond; and I may mention one other fact that showed this quality. We had the good fortune to have Mr. Hooper

for our landlord, and when, some years ago, it came to his knowledge that competition and stores were reducing the profits of trade, he did what many generous country squires have done, but what few urban property owners think to do. He gave us a new lease at a reduced rental, accompanied by kindly wishes, and without any solicitation from us. It is not in my knowledge to speak of his early interest in Bloomsbury Square and of his close relationship with Jacob Bell and the earlier giants of pharmacy. I have only spoken of the narrow personal knowledge arising out of my own connection with him. But I hope I have said enough to show something of the upright and generous nature of him who, full of years and honour, has gone to his rest.

24, Russell Street, W.C.

WM. WARREN.

MEDICAL MEN AND MANUFACTURERS.

Sir,—Would not the remarks contained in Dr. Notus' excellent letter have been sown with better results on ground not quite so barren as pharmacy. It is pleasing to hear what he has to say, the more so, coming as it does from a medical man, but the question has been discussed threadbare amongst chemists, who at last, by their apathetic and distrust adoption of things as they are, have accepted the inevitable with that kindly and benevolent grace which characterises them, and grows with them as they increase in stature and wisdom. If such sentiments could have found a prominent position in the columns of the medical press, there might be hopes for a brighter future. The medical curriculum is largely responsible for this condition of things. The compatibility of drugs is so lightly touched upon, and the general requirements of pharmacy so slight that it is scarcely to be wondered at if many medical men are only too ready to adopt a system of prescribing that will save both their time and their reasoning powers; and so long as manufacturers can find prescribers who are willing to become neither more or less than advertising mediums, they (the manufacturers) will continue to thrust their specialties upon them. It is a short-sighted policy, this prescribing of proprietary articles; the patient is so easily enabled to obtain a repetition of his prescription from the nearest grocer or draper, without reference either to the prescribing practitioner or the dispensing chemist, that the day is rapidly approaching when neither will be required. As a rule, these combinations of drugs are put up in an acceptable and attractive form, the patient has a predisposition to look upon medicine as an objectionable accompaniment to the doctor's visit—small wonder, then, if the patient swallows the more readily that which is presented in the most convenient and palatable shape. The French Codex is ahead of us in this matter, and it would be well if a few hints could be authoritatively borrowed from it, with a view to minimising the objection to medicine. The inconvenience to chemists by proprietary prescribing is great—but it is not for the medical man to consider this; he knows the combination that will bring about the required result, but he does not know how to combine it, and until he is taught the manufacturer will continue to reap profit from his ignorance.

Cambridge.

A. F. HEALD.

Books, etc., received.

ANATOMISCHER ATLAS DER PHARMAKOLOGIE UND NÄHRUNGSMITTELKUNDE. By Drs. TSCHIRCH and OESTERLE. Part 5. (Cort. Granati, Flor. Verbasci, Crocus, Flor. Calendulae, Flor. Carthami, Rhiz. Curcuma, Piper Nigrum, Piper Album). 1s. 6d. London: Williams and Norgate. From the Publishers.

THE ILLUSTRATED HINDU MEDICINAL PLANTS. By PURNA CHANDRA SAHA. Pp. 60. Calcutta: The Indian Drugs Supply Company. From the Secretary.

CONTRIBUTIONS TOWARDS A FLORA OF WEST ROSS. By G. CLARIDGE DRUCE, M.A., F.L.S. Reprinted from the Transactions and Proceedings of the Botanical Society of Edinburgh. Pp. 60. From the Author.

PHOTOGRAPHIC OPTICS: WITH A DESCRIPTION OF THE VARIOUS FORMS OF PHOTOGRAPHIC LENSES AND

THEIR USES. By O. C. VEYERS. Pp. 18. Illustrated. 2d. London: Dawbarn and Ward. From the Author.

VERSLAG OMTRENT DEN STAAT VAN SLANDS PLANTENTUM TE BUITENZORG OVER HET JAAR 1893. Pp. 167. Batavia Landsdrukkerij, 1894. From the Director of the Botanical Gardens, Buitenzorg.

STATE BOARD OF HEALTH, MASSACHUSETTS. Twenty-fifth Annual Report. Pp. 812. Boston, 1894. From the Board.

ST. THOMAS'S HOSPITAL REPORTS. Edited by Dr. T. D. ACLAND and Mr. BERNARD PITTS. Vol. xiii., pp. i.-xviii., 1 to 614. 8s. 6d. London: J. and A. Churchill. From the Hospital.

Diary of the Week.

SATURDAY, DECEMBER 8.

Pharmaceutical Football Club v. Bloomsbury, at Wormholt Farm, Shepherd's Bush, at 3 p.m.

MONDAY, DECEMBER 10.

Imperial Institute.

House Dinner, at 6.45 p.m.

"China and the Causes of its Present Disasters," by Professor R. K. Douglas, at 8.30 p.m.

WEDNESDAY, DECEMBER 12.

Pharmaceutical Society of Great Britain.

Library, Museum, School, and House Committee, at 11 a.m.

Evening Meeting at 7.30 p.m.

Imperial Institute.

Concert Dinner, at 6.30 p.m.

Ladies' Concert, at 8.30 p.m.

Society of Arts, at 8 p.m.

"Manufacture of Salt," by Thomas Ward.

Sheffield Pharmaceutical and Chemical Society, at 8.30 p.m.

"Pharmaceutical Politics."

Sunderland Chemists' Association.

Annual Dinner at the Grand Hotel, Sunderland.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.

"Notes and Queries" Conducted by William Duncan.

"Notes on Carbolio Acid," by George Coull.

"Novel Impurity in Chloral," by Alex. Gunn.

"A Seidlitz Powder," by Alex. Gunn.

"Incompatibility of Codeine Sulphate and Hydrobromic Acid," by William Duncan.

Imperial Institute, at 4.30 p.m.

"Some Aspects of British Forestry," by William Somerville.

Manchester Pharmaceutical Association, at 7.30 p.m.

"A Pharmaceutical Want List. A Discussion on Trade Topics," by John Taylor.

THURSDAY, DECEMBER 13.

School of Pharmacy Students' Association, at 7 p.m.

"A Piece of Granite," by Harold Read.

"Volumetric Analysis," by F. W. Burgess.

Chemists' Assistants' Association, at 8.30 p.m.

"The Future of Pharmacy," by H. A. D. Jowett.

Midland Pharmaceutical Association, at 8.30 p.m.

Social Meeting, with a Chat on Trade Topics, at the Midland Hotel.

Liverpool Chemists' Association.

"Distribution of Plant Life" (with Lantern Illustrations), by Professor R. J. Harvey Gibson.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

"Queensland and the Bush Pharmacy," by Mr. Billington.

"Italian Pharmacy," by H. B. Morgan.

SATURDAY, DECEMBER 15.

Sheffield Microscopical Society, at 8.30 p.m.

"The Microscopic Structure of Limestone," by Dr. Sorby.

Pharmaceutical Football Club v. Polytechnic, at Walthamstow, at 3.15 p.m. Leave Liverpool Street at 2.32 p.m.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Andrews, Baird, Browne, Clarke, Cocks, Cracknell, Gill, Heald, Hill, Holloway, Kemp, Kirkby, Laing, McBain, Perry, Pollitt, Reeve, Rideal, Smith, Wright.

REMARKS UPON THE NATURAL ORDER DIPTEROCARPACEÆ.*

BY DIETRICH BRANDIS, K.C.I.E., F.R.S.

Dipterocarps, though widely removed from Conifers in regard to their internal structure as well as in regard to their morphological characters, have yet certain important points of resemblance. They are tall trees, rarely shrubs, and numerous species form pure forests, in which one kind predominates, occupying the ground almost to the exclusion of other species. In Europe we are so accustomed to see extensive areas stocked almost exclusively with the Scotch pine, the mountain pine (*Pinus montana*), the spruce, and—of another family—the beech, that it seems to us quite natural that these trees should have the peculiarity of living gregariously, forming pure forests, with only a small and subordinate admixture of other kinds. In many cases, it is true, the forester's hand has been at work, and has gradually produced pure forests of large extent by encouraging the spread of certain species at the expense of other kinds. The spruce forests which cover the Harz Mountains in northern Germany, and the Erzgebirge in Saxony, the extensive larch woods around Dunkeld, are, the former to a great extent, the latter entirely, artificial, and remarkable instances of the skill and perseverance of Scotch and German foresters, though in many cases a certain admixture of other species would have been better. There are, however, extensive tracts of pure forest in Europe where the forester has hardly, or not at all, interfered. On the other hand, we have numerous species in Europe which, though producing good seed in abundance, yet have not the habit of forming pure woods to any large extent. One of the two oaks of northern Europe, *Quercus sessili flora*, never forms pure forests, but only thrives in company with other species, such as the beech, the hornbeam, and the silver fir. The two kinds of maple (*Acer pseudo-platanus* and *platanoides*) and the ash (*Fraxinus excelsior*) occur in small patches, scattered among woods of other kinds.

In tropical countries, where the number of species is many times larger than in Europe, the traveller naturally feels surprised when coming upon pure forests of wide extent, in which one species has obtained the upper hand, to the exclusion almost of all others. Yet such instances not rarely occur in the tropics, and among Dipterocarps many species are distinguished by this peculiar character. These species are gregarious in their habits, while other species of the same order are only found scattered in forests of other trees.

Another point of similarity between Conifers and Dipterocarps is that they both produce large quantities of resinous substances. These resinous substances we find, in the younger parts of the tree, invariably in special resin ducts, and these resin ducts, in Dipterocarps as well as in Conifers, are always lined by an epithelium of thin-walled secreting cells. This is the peculiar structure of these resin ducts, and the substances which fill them, in Conifers as well as in Dipterocarps, are invariably aromatic oily fluids. In the larch, the spruce, the cluster pine (*Pinus pinaster*), and in the pines which furnish the resin of the Southern

States of North America, these essential oils are commonly designated as turpentine. In the case of Dipterocarps, they are known under the name of wood oil and camphor oil. In physical and chemical characters turpentine and wood oil are very different substances, yet they have certain points in common. Thus, by exposure to the air, both are transformed into a hard, and, when pure, transparent mass, which is commonly designated as resin.

One kind of wood oil is official in the Pharmacopœia of India, though not contained in the British Pharmacopœia. This is the produce of *Dipterocarpus lavis*, Ham., *alatus*, Roxb. and of several other species of the same genus. These trees grow on the east side of the Bay of Bengal, in Chittagong, Arakan, Pegu, and Tenasserim, as well as on the Andaman and Nicobar Islands. The name by which they are known in Chittagong is Gurjun, and hence the product is commonly known as Gurjun oil or Gurjun balsam. In Burma the generic name is Kanyin. They are tall trees, growing scattered, singly or in small groups, in a dense forest of other trees, from which they generally stand out, and are readily recognised by their straight branchless stem, carrying a widely spreading crown, often 120 feet above the ground. From these trees the wood oil is obtained in the following manner:—

Deep niches are cut through the bark into the wood near the base of the stem, the first cut is about 4–6 inches deep and 12–18 inches wide at the base, but narrowing upwards. The bottom of the niche is slightly hollowed out to receive the oil. It oozes out and collects at the bottom of the niche a few days after the cut has been made.

As the oil turns into solid resin when exposed to the air for some time, the pores of the wood on the walls of the niche get clogged, and the oil then ceases to flow. The niche is then remade by chipping off the surface of the walls with the resin on it, or by lighting a small fire in the cavity. From the clean cut, or from the charred walls, the oil then oozes out again for some time. In this manner the niche is constantly enlarged upwards, so that it often attains a length of six feet. A number of niches are cut into one stem, and after some time the procedure comes to an end by the tree being blown over by the wind, or burnt.

In the wood of old trees of *Dipterocarpus alatus*, the wood oil is not only contained in the resin ducts mentioned above, but also in those cells of the medullary rays which are elongated in the direction of the radius. This wood oil has two properties, by which it can readily be recognised. It is slightly fluorescent, presenting a greenish opalescence on the surface. Heated to 270°, it becomes turbid and gelatinous (Pharm. of India, p. 32). This wood oil is used to paint woodwork and bamboo wicker-work in houses and in river-boats. It is also largely used medicinally, with good effect in gonorrhœa and certain skin diseases. Its use has also been attended with benefit in cases of true leprosy in its early stages, but it is not a specific against that terrible malady of tropical Asia.

A wood oil of much thicker consistency is yielded by another species, *Dipterocarpus tuberculatus*. This tree grows in Burma, and is one of the gregarious species alluded to above. It is called "Eng" (In) in Burmese. Large areas in Pegu and other parts of that country, are stocked

* The substance of a paper read at an Evening Meeting of the Pharmaceutical Society, on December 12.

with forest, in which this tree predominates. In this kind also the oil exudes from the outer layers of the wood when niches are cut into the stem, which is done in the same manner as in the case of the Kanyin. As many as six niches are cut into one stem.

The oil, as well as the resin, of both the Eng and Kanyin, is largely used to make torches. It is mixed with rotten wood, or sawdust, and is neatly wrapped up in the leaves of *Licuala peltata* and other palms, as well as of the screw pine (*Pandanus*). The cylinders are about twenty inches long and two inches in diameter, and are used as candles or torches. To light up the house, torch-holders or large candle-sticks are neatly carved out of wood, to hold two or more of these torches.

Dipterocarpus tuberculatus does not generally grow as tall as the different kinds of Kanyin, but it is a fine tree, with a clean stem, often 100 feet high. In the "Eng" forest, under the old trees, is an abundance of younger trees of the same kind, of all ages down to saplings and seedlings. The young plants of this species have huge leaves, up to two feet in diameter; they stand so close, that they cover the ground completely, and this makes it difficult for other trees to come up among them. Another point which enables the "Eng" tree to maintain the upper hand, and to gain preponderance over other trees, is that it produces an abundance of good seed every year, or nearly every year, which ripens at the right season, at the commencement of the south-west monsoon, with its heavy downpour of rain, after the forest fires of the hot season have passed over the country. Other trees, which ripen their seeds earlier in the year, cannot compete with the "Eng" tree because a large proportion of their seed is destroyed by the annual fires of the hot season.

Another tree of the same family, the "Sâl," *Shorea robusta*, Gaertn, one of the most important timber trees of Hindustan and the Western Peninsula, also grows gregariously, forming pure, or nearly pure, forests of immense extent at the foot of the Himalaya and in Central India. Like *Dipterocarpus tuberculatus*, it produces an abundance of good seed annually, the seed ripens at the right time of year, and it germinates immediately, often before it falls from the tree. The leaves of the young plants are large, and the seedlings of the "Sâl" tree have another peculiarity which stands them in good stead, and which those of the "Eng" tree also possess—they stand much shade while young.

No wood oil is obtained from the "Sâl" tree, but it yields large quantities of resin. Other species also of the genus *Shorea* yield resin, which, in the leaves and younger branches, is, like wood oil, found in special resin ducts, but which in old trees forms huge solid lumps in cavities of the stem and between wood and bark.

Besides *Dipterocarpus* and *Shorea* most other genera of this order yield resin in large quantities. As the family of Dipterocarps is at present defined (excluding *Ancistrocladus* and *Lophira*) it comprises 320 well-established species, which may most conveniently be arranged under sixteen genera. Wherever Dipterocarps grow, that is nearly over the whole of tropical Asia, resin is yielded by them. On the Seychelles it is *Vateria seychellarum*, Dyer, in the Western Peninsula, *Vateria indica*, L., and

species of *Shorea* and *Hopea*, in Ceylon, *Vateria acuminata*, Hayne, species of *Doona* and *Stemonoporus*, in the Eastern Peninsula chiefly species of *Dipterocarpus*, *Shorea* and *Hopea*. Trees of the order produce resin in Borneo and the other islands of the Indian Archipelago, as well as in the Philippines and in New Guinea. This resin is not only obtained from the stem. Like the African copal, great masses are found in the ground near the roots of the tree.

The species of one genus, *Dryobalanops*, do not yield resin, but they furnish a product of far greater value, the well-known Borneo camphor, which is found deposited as beautiful colourless or light yellow crystals in fissures and between the fibres of the wood. This genus comprises a few species only, which grow in Borneo and Sumatra, the camphor produced in Sumatra being commonly known as Baros camphor. The trees are very large, similar in appearance to the wood oil trees. The process is most wasteful, the trees are cut down, two ounces being about the largest quantity obtained from one stem. The price is high, 50s. to 95s. a pound. It is exported to China, where it is highly prized as a tonic and aphrodisiac. In Sumatra it is used for the purpose of embalming the bodies of chiefs and other great people. It need hardly be mentioned that the Borneo or Baros camphor is distinct from the camphor of Japan and Formosa, the product of *Cinnamomum camphora* and from the Ngai camphor, the produce of a large herb of the Compositæ, *Blumea balsamifera*, D.C., which grows up in abundance on deserted "Tonugyas" (hill clearings, where one crop of rice is raised after cutting and burning the forest) in Burma, Siam, and Southern China.

As in the case of the species of *Dipterocarps* previously described, the resin ducts in the leaves and young branches of *Dryobalanops* contain an essential oil known under the name of camphor oil, and this is obtained from incisions in the trunk.

The seeds of *Dipterocarps* as a rule contain no albumin, but are filled up entirely by the embryo with two cotyledons, which in most cases are bifid down to the base. Generally they are thick and fleshy, or, if flat, much twisted and corrugated. In most species the cells of these cotyledons, as well as those of the radicle, are filled with starch, which, when the seed germinates, is expended to feed the seedling until the first green leaves have been formed, and the root has commenced to act. In some species, however, belonging to the genera *Shorea*, *Isoptera* and *Vateria*, the non-nitrogenous substances stored in the seed consist not of starch, but of a fat oil. This Fat, when pressed out from the seed, is not fluid like the oils of rape or linseed, but has the consistency of tallow. On the west coast of India the seed of *Vateria indica*, L., yields large quantities of a beautiful white tallow, known as piney tallow or vegetable butter, which is made into candles and sold in the bazaars of Kanara. The Journal of this Society for 1884 (pages 407 and 428) and for 1887 (page 901) contains valuable articles, translated from the Dutch, on the subject of the "Tang Kawang" Fat or vegetable tallow, the produce of *Isoptera borneensis*, and of several species of *Shorea*, which grow on the island of Borneo. And the Museum of this

Society contains a most valuable collection of specimens of these trees, as well as of the "Tang Kawang" Fat, preserved in the original hollow bamboos in which it is collected by the natives of Borneo.

THE SPAGIRISTS.*

BY JOSEPH INCE.

Lecturer in Pharmacy to the Pharmaceutical Society of Great Britain.

The 'Art of Distillation,' by John Frenoh, Doctor of Physick, has for a sub-title, 'A Treatise of the Choicest Spagiricall Preparations Performed by way of Distillation.' The book also contains a discourse on divers spagiricall experiments. In both instances the mediæval adjective is used as synonymous with chemical, which is not the exact historical meaning of the word, but a later application.

It might, perhaps, be interesting to know what the sect of the Spagirists was, and what was intended by the *ars spagirica*, or spagiria; the subject may claim some pharmaceutical importance, since the truth underlying much fanciful farrago has directly influenced the science of to-day, and has received in the nineteenth century its fullest interpretation.

Many dictionaries adopt a popular definition of spagiria, and explain it as either alchemy or chemistry; other authorities say that Paracelsus coined the word "spaher," the searcher; but standard works of reference, with great unanimity, derive the term from *σπᾶν*, to separate, and *ἀγείρειν*, to unite. This is further stated by some to point to the two chemical processes of analysis and synthesis, but considering the date of the sect, which flourished during the sixteenth century, when exact experiment was rare and science was in a nebulous condition, this is giving more credit than is due. I would rather adopt the words, "to bind and to loose," which about expresses the truth.

Spagiria and alchemy cannot be considered as synonyms if history is to be taken into account; the Spagirist was the successor, and infinitely superior to the alchemist, and Vossius may be accepted as an authority:—

"*Puto autem spagiricæ dici a duobus artes officia quæ sunt resolvere composita et resoluta componere. Nam, σπᾶν trahere, extrahere: ἀγείρειν, congregare.*"

[I think, however, that arts are said to be spagiric from two functions, which are: to separate things combined, and to combine separate things. For *σπᾶν* means to draw, to draw out; *ἀγείρειν*, to combine.

Coming to closer definition, we find that Paracelsus was the first who applied the term to chemical medicine. Spagiria was the revolt, or rather the emancipation from, the restricted medicine of the age which sought for remedies only in the vegetable kingdom; the Spagirists enlarged the boundaries of therapeutics by the introduction of remedies drawn from inorganic sources; the first outcome of the new departure was the exhibition of antimony as an emetic. The chemist studied the nature and reactions of chemical substances; the Spagirist devoted himself to their use in the healing art; the alchemist dreamed dreams and saw visions of the elixir of life and the philosopher's stone.

The sect of the Spagirists is accurately described in the 'Dictionary of Medical Science' by Robley Dunglison (1893): "A sect of physicians pretending to account for the changes in the human body in health and disease in the same way as the chemists formerly explained those of the organic kingdom." 'Le Dictionnaire Encyclopédique des Sciences Médicales' (1881), edited by A. Dechambre, other French writers, various English medical dictionaries, and, lastly, Dr. Paris in his 'Historical Introduction,' give particulars relating to the professors of the *ars spagirica*. Basil Valentine led the way by experimenting on the nature and internal administration of antimony; up to this date metallic remedies (iron excepted) had been confined to external application.

In the 'Triumphant Chariot of Antimony,' Brother Basil (b. 1394) writes:—"The shortness of life makes it impossible for one man thoroughly to learn antimony, in which every day something of new is discovered."

Paracelsus (1490), charlatan and chemist, afterwards became the champion of antimony, and was the first to introduce the internal use of mercury. Van Helmont recommended alum in uterine hemorrhage; while numbers whose names need not be chronicled followed in the same path.

Joseph Du Chesne (Querquetanus), physician to Henry IV. of France (1553), Israel Harvet, and Guillaume Baucinet (both from Orleans), André Libavius, and their immediate followers, raised the study and practice of chemo-medical therapeutics in a remarkable manner, and obtained results as important as unexpected.

The system was officially recognised in the reign of Henry IV. (mentioned already) when the title of Physician-Spagirist to the King (*médecin-spagiriste du Roi*) was conferred on Mathurin Morin, a post which was continued during subsequent reigns.

A celebrated Spagirist under Louis XIII. was Guillaume Yvelin (1611-1613), four official Spagirists flourished under Louis XIV., and one, Eloy Picot, retained a court position so late as Louis XVI.

Great excess characterized the early stage of this movement, in itself excellent and excelsior, but that was the tone and temper of the age. The chemists, as a sect, traced every imaginable disease to the presence of some hostile acid or alkali; the Spagirists, as a sect, maintained that chemical bodies were a panacea for all the ills to which flesh is heir; the orthodox physician despised them both. The Galenists began to tremble for their reputation, and war, which waged for two centuries, was openly declared. In France, the Paris Faculty of Medicine rose up and denounced the system. Guy-Patin was a special opponent, virulent and sarcastic. Spagiria was called the true doctrine of the pest (*la pure et vraie doctrine de la peste*). Amongst innumerable diatribes was one on 'Spagirie Impostors: A Treatise against the rash presumption and intolerable imposture of the Spagirists,' with kindred specimens of gall and bitterness.

The Supreme Council of Paris (1566) was appealed to, for a time successfully, to put down the insurrection against the hitherto received canons of medical practice. The progress of discovery could not, however, be arrested, and in 1608 calomel, the very type of the spagiric art, was made known. In the midst of these disputes the

* Paper submitted at an Evening Meeting of the Pharmaceutical Society on December 12.

term "medical orthodoxy," or "orthodox medicine," originated. The Hon. Robert Boyle [Works, vol. 1, fol. 463] regretted the extremes to which both parties were committed. The chemists, he said, looked upon the Spagirists as a company of mere irrational impostors, whose services might be serviceable to apothecaries, and perhaps to physicians, but were useless to a philosopher who aims at curing no disease but that of ignorance. The Spagirists looked upon the corpuscularians (chemists) as a sort of empty and extravagant speculators who pretended to explain the great book of nature without reference to the phenomena which the spagirc art had revealed.

Towards the middle of the 17th century, the word spagirc ceased to be used in a restricted sense, and received the wider acceptation of "chemical," which accounts for some apparent contradictions in works of reference.

It may be repeated, that the term "spagiria" indicated the medical application of substances taken from the inorganic world; the Spagirists were the sect who introduced and practised that system—it is what is called, in French, "La Chimie Médicale."

The moment it was set free from irrational dogmatism, and was recognised as an integral part, but not as the whole, of medical treatment, its influence was immense and permanent. It wonderfully strengthened the physician's hands, and gave him a new power. Pharmacopœias of all nations (after a certain date) exhibit a long array of spagirc remedies. Pharmaceutical research laboratories are one of the latest developments of spagiria.

The difference between the old system and its modern application is, that those concerned with medicines have discarded the vain imaginings and fancied claims of imperfect knowledge in favour of the accurate methods of investigation of the present day; but should they, despising the florid verbiage of their ancestors, fail to recognise the teaching of the pioneers of the spagirc art, they must cancel many pharmacopœias and close all research laboratories in connection with, and devoted to, the chemistry of medicine.

NOTES ON OPOPANAX.*

BY E. M. HOLMES, F.L.S.

Curator of the Museums of the Pharmaceutical Society of Great Britain.

The name "opopanax" (i.e., the juice of Panax) is better known at the present day in connection with a perfume so called, than with the gum-resin which under that name was at one time extensively used in medicine. With the exception of *sagapenum*, hardly any other gum resin is now so little known. Even its botanical origin has been, up to the present time, involved in obscurity, and with the exception of Merat and De Lens, most writers on *materia medica* assumed that it was obtained from a plant indigenous to Greece and Eastern Europe, viz., *Opopanax chironium*, Koch. This error probably arose from the fact that three panakes, or Panax plants, are described by Dioscorides.

The authors of 'Pharmacographia' remark concerning this error:—"We have never seen a specimen obtained from this plant, but can say that the gum-resin of the nearly allied *Opopanax*

persicum, Boiss, as collected by Loftus at Kirrind, in W. Persia, in 1851, has neither the appearance nor the characteristic odour of official opopanax. Powell, who endeavoured to trace the origin of the drug, regards it as a product of Persia ('Economic Products of the Punjab, 1868,' p. 403). *Opopanax* was very common in old pharmacy, but has fallen out of use, and is now both rare and expensive."

The above is the most trustworthy account of the drug that I have seen. I have tasted the leaves of *Opopanax chironium* as cultivated in the Apothecaries' Garden at Chelsea, and can positively affirm that the plant has not the least resemblance to opopanax in flavour. I can also confirm Powell's suggestion as to its geographical source. I have learned through Messrs. G. N. Souratt and Co. that it is imported from Persia. Acting on this information I endeavoured some years since to obtain the plant, but, owing to various causes—amongst others the prevalence of cholera in the district where it grows—I was unable to get specimens. About two years ago Mr. W. Martindale kindly informed me that Dr. E. Treacher Collins was going to Persia to attend the son of the Sultan, and would be very pleased to make enquiries about any Persian drugs. The results of his enquiries (which I suggested should include the botanical sources of opopanax, *sagapenum*, and *galbanum*) were received about two months ago, and the opopanax brought by Dr. Collins proved useful in tracing the source of the drug. Judging from the specimens received, the gum resin, when carefully collected from the stems and flowering tops, has a most powerful odour and an equally strong taste of celery. It is then in small grains and has a pale brownish-yellow colour. In the specimens that have been gathered from the root the gum resin is more disagreeable, and possesses the characteristic odour of bruised ivy leaves which old or inferior specimens of the drug invariably give off, but even those possess the celery taste. In Persia the name of the plant is "Kalous," or wild celery. This flavour in opopanax was quite new to me, but it throws some light upon the drug. Under *Levisticum*, which has also a celery flavour, Dioscorides remarks that it is called by other writers Panakes or Panacea, indicating that the drug Panakes, or opopanax, had a flavour like that of *Lovaeg* (*Levisticum officinale*, Koch), and the genuine opopanax, attributed to a species of *Heracleum*, apparently possesses the same flavour. The use of the drug in Persia as a condiment and stomachic suggests the possibility that this might have been the *Asa dulcis* of the Romans, since such a flavouring agent would have been much more acceptable than *asafoetida*, and a small quantity of opopanax would be much more powerful, and therefore more economical, than *Lovaeg*.

It is remarkable that, although the same odour is found in a number of plants and in different natural orders, its chemical nature has never been determined. The following plants, *Trigonella fœnum-græcum*, and *Melilotus cœrulea* in Leguminosæ; *Levisticum* and *Osmorrhiza* in Umbelliferae; and *Ulmus fulva* in Urticaceæ, etc., possess it in a remarkable degree. Concerning the botanical source of the opopanax, I can only state that the drug is collected from plants growing on the mountains to the south-east of Ispahan.

A specimen of opopanax recently presented to the Museum by Messrs. T. Christy and Co. exactly

* Paper submitted at an Evening Meeting of the Pharmaceutical Society, on December 12.

corresponds with Dr. Collins' specimens. I understand that this gum-resin has recently been exported to Germany in considerable quantity for so rare and expensive a drug.

With regard to the perfume called opopanax, I find that the oil of opopanax of perfumery is obtained from a gum-resin which has a totally different origin, being derived from *Commiphora kataf*, Engl. Burseraceae. It is the "Bisabol" of Pharmacographia (2nd. Ed., p. 145), and the perfumed bdellium of Dymock, Mat. Med. India, p. 158-9. In appearance it resembles opopanax and myrrh also, but it has as lightly pleasant and quite distinctive odour.

EUCALYPTUS OIL.*

BY E. M. HOLMES, F.L.S.,

Curator of the Museums of the Pharmaceutical Society of Great Britain.

Oil of eucalyptus holds a somewhat anomalous position in pharmacy. It is official in the pharmacopœias of Great Britain, the United States, France, Japan, and Belgium, but is not so in those of Germany, Holland, or Switzerland. Indeed, it is stated by one of the largest manufacturers of essential oils in Germany that there is comparatively little public demand for the oil in Germany, and that the same is the case in France.

Yet it has been stated in some of the leading medical periodicals in this country and on the Continent to be three times as strong as carbolic acid in preventing the development of bacteria. In this country it was so largely used as a prophylactic during the epidemic of influenza that at one time it was scarcely procurable in commerce. But the quality and character of the oil have always been uncertain. This inequality has arisen from the fact that different species have been used for the distillation of the oil. At first *Eucalyptus amygdalina* was used, then *E. oleosa*, *E. dumosa*, *E. globulus*, *E. cneorifolia*, *E. odorata*, and probably other species were used. These oils differ greatly in composition. In some phellandrene has been found, and in others eucalyptol as a principal ingredient.

The reputation of the oil rests upon a very unsatisfactory basis. On the one hand, eucalyptol is claimed to be the active ingredient, whilst on the other, phellandrene is the constituent in the oil on which partly its reputation is based. We do not know at the present moment how far the antiseptic action is due to ozone, to eucalyptol, to phellandrene, or to some of the aldehydes which are known to be present in the oil. It may even be to one of the latter class of bodies, since it is known that some aldehydes—formic aldehyde, for instance—are powerful antiseptics. The chemistry is, in fact, far in advance of the therapeutic and physiological knowledge of the oil. The principal object I have at present in view is to direct attention to the statement that eucalyptol can now, by virtue of Faulding's new patent process, be prepared in a perfectly pure state by the decomposition of its phosphoric compound and that it is therefore quite possible for pharmacologists to determine its real value or otherwise by actual experiment. If it be proved to be the most important ingredient in the

oil, its adoption in the Pharmacopœia, instead of an oil which may be uncertain in its percentage of eucalyptol, and certainly is often variable in its odour according to its botanical source, would be much more satisfactory; in all probability not only to the prescriber and the dispenser, but to the patient.

Should, eucalyptol however, not prove to be the most valuable constituent of the oil, it may be useful to direct attention to the other known constituents of the oils of eucalyptus that have been offered in commerce, and to give a brief description of one the most recent processes adopted for their distillation, inasmuch as the methods of distillation probably exert some influence on the character of the products.

The chemical examination of some of the eucalyptus oils has shown that nearly 25 per cent. of the bulk of the oil usually consists of some terpene, apparently limonene in most cases, but in others pinene, the remainder being composed in large proportion of eucalyptol, or in a few cases of a ketone.

There have also been found in the eucalyptus oils of commerce, phellandrene, and a heavy saponifiable oil, each in the proportion of about 10 per cent., and, in smaller quantities, various bodies, some of which belong to the class of aldehydes. The latter possess the property of irritating the air passages when the oil is inhaled. Whether any of these bodies are actually present in the leaves of the plant, or are formed under the influence of heat, by the aid of the natural acids present in the leaf, has not yet been determined. In any case they differ in different species, some coming over in the first part of the distilled oil, and others in the last part. Thus cuminic aldehyde has been detected in the oils of *E. cneorifolia* and *E. hemiphloia*, valeric aldehyde in *E. rostrata*, and butyric, caproic, and valeric aldehydes in *E. globulus*, as well as ethyl and amyl alcohols. Some doubt has been expressed as to the occurrence of phellandrene in the oils as distilled from the plant, although it has certainly been found in several of the oils of commerce.

For the following account of the method of distilling the oil in Australia I am indebted to Mr. E. E. M. Payne, who has seen the process conducted in that country.

"The process commonly adopted for the distillation of the oil is as follows:—The fresh leaves are packed in the still without water and steam is passed through them. The steam on condensation leaves in the receiver an oil which in the case of *E. cneorifolia*, *E. goniocalyx*, and *E. incrassata* is of a dark colour; in the oil of *E. odorata* the colour is of a pale yellow.

"The crude oil thus obtained is mixed with a solution of caustic soda and re-distilled in order to remove the irritating bodies and saponifiable oils of high specific gravity, '950-970'; the aldehydes do not appear, however, to be entirely removed by this process. The distilled oil thus obtained forms the ordinary eucalyptus oil of commerce.

"About 10 per cent. of the original oil is left in the still, partly in combination with the sodium hydrate, forming an acid soap insoluble in water. This impure liquid soap is of a dark colour and syrupy consistence. It is commonly known amongst distillers as 'eucalyptus tar' or 'resin oil,' although it does not contain any true resin. In

* Paper submitted at an Evening Meeting of the Pharmaceutical Society, on December 12.

Australia it is sometimes employed as an ingredient in cheap disinfectants and for adding to perfumes for soaps, but it is often thrown away. By acting upon this eucalyptus tar with a strong non-corrosive acid a heavy oil can be separated (of specific gravity .970 in the case of *E. odorata*) which differs in odour and character according to the variety of *Eucalyptus* from which it is made. In no case, however, is its composition accurately known."

It may here be remarked that the removal of 10 per cent. of a heavy oil, by reducing the volume of the original product, naturally increases the apparent percentage of eucalyptol. The amount found in commercial specimens of the oil has been estimated at 60-70 per cent. According to Mr. Payne's experience, however, this is decidedly above the average amount contained in the crude or natural oil. In some careful experiments conducted by him with the view of determining the average amount of eucalyptol present in the leaves of *E. odorata* during the season from October to May, the whole of the produce (1500 tons of leaves) collected during that time was examined, and the average was found to amount to exactly 50 per cent. of eucalyptol. The percentage varied a little according to the weather, a rise of temperature increasing the amount of eucalyptol, and a fall decreasing it.

In none of the oils examined, viz., *E. odorata*, *E. neorifolia*, *E. incrassata*, *E. goniocalyx*, and *Melaleuca uncinata*, did he find the percentage to exceed 55 per cent., nor did it fall below 45 per cent.

The specific gravity of the oil cannot always be taken as an indication of its richness in eucalyptol, for in a sample of the oil distilled from the young leaves of *E. odorata* of less than one year's growth, the specific gravity was lower than usual, owing to the absence of the heavy oil, and to the larger proportion of limonene, although it contained the average amount of eucalyptol.

Eucalyptol is now separated by adding syrupy phosphoric acid to eucalyptus oil, when a crystallised compound separates out. The "phosphate of eucalyptol" so formed is decomposed in contact with water, and the eucalyptol can then be obtained in what is affirmed to be a perfectly pure state, inasmuch as it possesses no odour of the aldehydes, but does possess the melting point, specific gravity, boiling point, and activity as regards polarisation, that characterise the pure article. This method, which has been patented for manufacturing purposes as "Faulding's process," can therefore be utilised as a test of the presence of eucalyptol in any given oil, or of the purity of eucalyptol itself. It is employed for the determination of eucalyptol in eucalyptus and other volatile oils, and its extraction from the same oils.

Seeing that the properties of the other ingredients of eucalyptus oil are unknown, and may yet be of value an oil has been placed in commerce, derived from *E. odorata*, and standardised to contain 50 per cent. of eucalyptol. This is intended to serve as a perfectly pure oil, containing all the normal constituents in the average proportion, for use in cases in which such an oil may seem preferable to eucalyptol.

THE NEW EDITION OF THE PHARMACOPŒIA.

REPORT OF THE PHARMACOPŒIA COMMITTEE.

The following is the text of the report of the Pharmacopœia Committee, as received and entered on the minutes by the General Medical Council on December 5, and published in last week's *Lancet*:—

"The Registrar reported that, since the last meeting of the Council in November, 718 copies of the British Pharmacopœia, 1885, have been sold; that the total number of copies sold up to the present date have been 41,718; and that 1090 remain in stock; further, that 579 copies of the Additions of 1890 have since been sold, that the total number sold to the present date have been 13,204, and that 190 copies of the Additions remain in stock.

"The Committee has to report, in connection with the proposed extension of the operation of the Pharmacopœia to India and the colonies, that a large number of very satisfactory official communications have been already received by the President, through the Privy Council, from those distant dependencies of the Crown, and recommends that the thanks of the Council be returned for the same, with a request that the several Indian and colonial medical and pharmaceutical authorities will be good enough to continue to aid in the production of this edition.

"The Committee recommends that, in accordance with the instructions of the Council, and as in the production of the British Pharmacopœia of 1885, and its Addendum of 1890, the President of the Council apply to the respective medical authorities of Great Britain and Ireland, asking their co-operation and assistance in the compilation of the proposed new editions of the Pharmacopœia, more especially as regards omissions, alterations, and additions, the authorities being requested to reply before March next.

"The Committee, remembering the valuable assistance given to the Medical Council by the Pharmaceutical Society of Great Britain in the production of the Pharmacopœia Addendum of 1890, recommends that the invitation to that Society to assist in the compilation of a new Pharmacopœia be forwarded at once, as regards the obtaining of trustworthy statistics respecting well-recognised non-official remedies which are largely in demand, and respecting those official remedies which appear to have become superseded the Society to reply before March next. Further, the Committee recommends that the Council of the Society be invited, as heretofore, to give to the Medical Council, before May next, the names of pharmacists who would be willing to serve on a Pharmaceutical Pharmacopœia Committee, under the guidance of the Society's Council such Committee finally reporting, with the concurrence of the Society's Council, to the Medical Council, through the Pharmacopœia Committee of the latter Council.

"The Committee has taken note of the opinions expressed in the Council on the question of associating with Professor Atfield one or more persons conversant with other than the pharmaceutical aspects of the work of the editorship. The question whether

this is necessary and practicable will be carefully considered by the Committee and will be reported upon to the Council at its next session. The Committee thinks it most important that the Council should be fully informed as to the method adopted in preparing previous editions of the Pharmacopœia, and more particularly the last edition. It first appointed an editor or editors in pursuance of the terms of section 54 of the Medical Act, 1858. The Committee then adopted the following memorandum:—

“The Committee is desirous of enlisting the co-operation of the several medical and pharmaceutical authorities, and of such persons as may be able to furnish useful information, with the view of rendering the work as complete and accurate as possible. In furtherance of this object the Committee invites, and will be happy to receive, such suggestions as may be made to it by the above-mentioned authorities, and to give these suggestions most attentive consideration.”

“This memorandum was sent to nineteen medical authorities, thirty-two pharmaceutical authorities, and forty-one persons known to be competent to advise and assist the Council. In response about 350 replies were received. These were arranged, printed, and submitted to each member of the Pharmacopœia Committee. The replies had reference, not only to the insertion of new medicines and the omission of obsolete ones, but to many alterations and changes in the composition of medicines, to doses, and the like. Especially valuable were the replies upon these points from the Royal College of Physicians of London. The Committee proposes to address a like communication to the several authorities as on previous occasions and to invite them to send to the President such suggestions as they may be pleased to offer before the end of March next. All such suggestions will then be arranged in a convenient form, printed, and sent to each member of the Pharmacopœia Committee prior to the next session of the Council. The Committee will then consider whether its members feel capable of themselves deciding upon the medical questions raised by the various suggestions, as they have hitherto done, or whether they feel it necessary to seek assistance of this nature outside the Committee. This point will be best determined when the whole of the suggestions are before the members. The Committee further recommend that at the Council's meeting in May next, the constitution of the Pharmacopœia Committee be considered.”

Patent Office Business.

APPLICATION FOR PATENTS.

No. 23103.—November 28.—Emily Horton, 186, Gloucester Road, Bishopston, Bristol. Lotion.

No. 23270.—November 30.—George Archibald Clowes, 23, Southampton Buildings, Chancery Lane, E.C. A new or improved medicinal and nutritive compound or preparation.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, DECEMBER 15, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 6, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, 17, Bloomsbury Square, London, W.C.

THE REVISION OF THE PHARMACOPŒIA.

At the meeting of the General Medical Council, on Tuesday, December 4, the report of the Pharmacopœia Committee was discussed, but the motion of Sir DYCE DUCKWORTH, that it be received and entered on the minutes, was defeated, and an amendment carried that it be re-committed. Dr. TUKE, in moving the amendment, objected that the Committee had had no adequate opportunity of studying and considering the report, the draft of which was presented at the hour of meeting only, and he urged that, under the proposed arrangements, the new work would be purely a pharmacist's pharmacopœia. In his opinion, also, one expert physician from each part of the kingdom should be associated with the editor in the work, whilst the sum proposed for the remuneration of the editor was excessive, being out of proportion to his view of the work to be done.

The President, Sir RICHARD QUAIN, Bart., said that Dr. TUKE had formed misconceptions on the subject owing to his ignorance of the facts of the case, and he believed the main ground of offence was the proposed consultative committee, consisting of four English members—the President, Sir DYCE DUCKWORTH, Dr. LEECH, and Mr. CARTER. That committee, however, would have no authority whatever, the object being simply to have some one on the spot in cases of doubt, to whom the editor might refer. There had been a suggestion for the introduction of pharmacology into the Pharmacopœia, but the Medical Council had no power and no funds for that purpose. Drs. LEECH, MACALISTER, and McVAIL also supported the amendment, whilst Dr. BRUCE said they seemed to be drifting into a pharmacists' pharmacopœia, instead of a medical one. On a vote being taken, the amendment was carried by 12 to 9.

The subject, having been re-considered in the interval by the committee, was again brought up on Wednesday, December 5, when Dr. MACALISTER stated that the first and second paragraphs, of the report presented on the previous day by Sir DYCE DUCKWORTH stood as originally drafted, but certain alterations had been made in subsequent paragraphs and others were deleted in their entirety. Finally, the report, as amended, was adopted. The full text of the report will be found at page 502), of the Journal.

THE TREATMENT OF DIPHTHERIA.

DR. SIMS WOODHEAD, the director of the research laboratories of the Royal College of Physicians and Surgeons read a paper at the Examination Hall, on December 7, on the antitoxin treatment of diphtheria, under the auspices of the British Institute of Public Health.

The lecturer first dealt with statistics of the incidence of diphtheria in England during the last five years, and pointed out that the mortality had diminished during that period in this country, so that at the present time it was only about 23 per cent., against an average of about 50 per cent. in France. Not only had that fact to be kept in mind when dealing with the statistics of the antitoxin treatment, but also the ages of the patients: the disease has been found to be much more fatal in children under three years of age than in older subjects.

The history of the antitoxin treatment was traced much as it has already been given in our columns, and the morphology of the bacillus and the methods of cultivation were beautifully illustrated by lime-light projections. The colonies grow quickly—more quickly than those of any other bacillus usually met with in the human mouth—and form rounded white colonies with crenated margins. The method adopted by the State authorities in America for the bacteriological certification of diphtheria consists in supplying the practitioner with a small cardboard box enclosing two test-tubes, of which one contains solidified nutrient serum, and the other a steel probe with a pad of sterilised cotton wool at its lower end. Both tubes are plugged with sterilised cotton wool. The practitioner removes the plug from the tube containing the probe, presses the padded end of the latter, first on the surface of the suspected membrane in his patient's throat, and secondly on the slanting surface of the serum. This done, the culture tube is re-plugged, the probe and the plug are replaced in the other tube, and the whole apparatus despatched to the bacteriologist, who is able to make a diagnosis within twenty hours. Clinical diagnosis will not, however, be entirely relinquished, even by the most ad-

vanced phytologists, for Dr. WOODHEAD informed his hearers that sometimes the bacilli disappeared from their habitat—the surface of the diphtheritic membrane—long before the case was over, and, on the other hand, they had been found in the mouth some weeks after the membrane had disappeared and convalescence had set in. The latter fact is of great importance for the investigation of epidemics in schools.

The lecturer showed in full detail, by photographs, the method of preparing the supply of toxin for use in immunising animals. A shallow layer of nutrient broth is placed in a covered glass dish, furnished with two openings. After inoculation, one of the openings is fitted with a tube, which brings a current of air filtered through cotton wool and saturated with water by being passed through a wash-bottle. The stream of air is kept up by the ordinary method of aspiration, that is by passing a continuous jet of water over the extremity of a glass tube fitted to the second opening in the culture-dish, and the whole apparatus is so arranged that it can be kept in an incubator at a temperature of 37° C. In this way large quantities of the toxin can be prepared in a few weeks. The manner in which the strength of the antitoxin is gauged was also explained. Equal quantities of toxin of known potency are placed in a series of test-tubes, and then antitoxin is added to the tubes in amounts which decrease from (say) one-fifth of the amount of the toxin in the first tube, to one-fiftieth in the tenth. It is then found by experiment what is the lowest proportion of antitoxin which completely neutralises the poison. After reviewing the whole of the evidence, the lecturer most earnestly advocated a full trial of the antitoxin in this country, and at the same time urged his hearers not to regard the success of the treatment as already proved.

Lord PLAYFAIR, in proposing a vote of thanks to Dr. WOODHEAD, said that he hoped the mistaken action of a certain body of persons, whose motives he approved, would not prevent this country from doing its plain duty, and vindicating its claim to common sense in having the new method of treatment fairly tested.

PROCEEDINGS UNDER THE PHARMACY ACT.

WE have from time to time commented upon the difficulties that interfere with the proper administration of the Pharmacy Act of 1868, and the case at Mansfield, of which we publish a report on page 519, exemplifies a difficulty which most decidedly ought not to exist. In this case the defendant appears to have had some pharmaceutical experience in his early days, but he had not seen fit to become registered under the Act before commencing business on his own account, and the manner in which he supplied poisons to his

customers was such as to render the proof of sale extremely difficult. The County Court judge was not satisfied that the case was thoroughly made out, and, accordingly, gave the defendant the benefit of the doubt, but he thought the Society was quite justified in bringing the case forward, and disallowed defendant's costs.

The main interest in the case, however, centres in the fact that the defendant was apparently aided in the unlawful supply of poisons by a registered pharmaceutical chemist, who himself gave evidence for the defence. This indicates a state of affairs which cannot be too strongly deprecated. If the Society, in its efforts to protect the interests both of the public and of pharmacists, is to be not merely unsupported by at least the sympathy of the trade but thwarted in its endeavours, it is a little difficult to see upon what ground those who help themselves so little can expect to be protected from the evil effects of their own misdeeds.

If any registered man objects to the policy pursued by the Pharmaceutical Society and abstains from connection with it, he is in no degree absolved from the unwritten yet general rule that the members of a given craft should be prepared to sink all differences when the Act under which he is registered is being infringed. The least that is expected from him is to behave honourably to his fellow-pharmacists, and this he certainly does not do when he assists unregistered individuals, directly or indirectly, in their attempts to infringe the provisions of the Pharmacy Act with impunity.

On the same day a very similar case was heard at Abergavenny, where a grocer named Pegler had sent out for a bottle of Fellows' syrup and supplied it to the purchaser. Here, however, the proof of sale was less difficult, a receipted bill having been given, and judgment was given for the Pharmaceutical Society. A report of the case will appear in next week's Journal, as will also that of a case at Oldham, on Thursday, when judgment was given for two penalties and costs against W. SCHOFIELD, medical botanist.

NAVAL DISPENSERS.

It appears, according to a communication received by the Council of the Pharmaceutical Society of Ireland from the Director-General of the Naval Medical Department, that persons registered under the Irish Pharmacy Act are regarded as ineligible for the post of dispenser in the Royal Navy. Considering the high standard of education maintained by the Irish Society, this exclusion of its graduates from the public service is both impolitic and unjust, and it is to be hoped that the present inequality under which they suffer in this respect may soon be removed.

MISCELLANEOUS NOTES.

At the moment of going to press we learn from Mr. THOMAS HANBURY that he has received a telegram stating that Professor FLÜCKIGER is dead.

At a meeting of the Privy Council on the 11th inst., the recent appointment of examiners by the Pharmaceutical Council was confirmed.

THE chemists' twenty-ninth annual ball will be held at the Portman Rooms, Baker Street, W., on Wednesday, January 16, 1895. Mr. DAN GODFREY's quadrille band will be in attendance, conducted by Mr. DAN GODFREY. Applications for tickets (ladies', 12s. 6d.; gentlemen's, 17s. 6d.), which must be accompanied by a remittance, should be made to the Honorary Secretary, Mr. A. J. PHILLIPS, 156, Cromwell Road, South Kensington.

At a recent meeting of the members of the Blackpool Scientific Society, Mr. C. H. TURVER, chemist and druggist, read a paper on "Money, its uses and origin," in the course of which he pleaded for the adoption of the decimal system, and moved the following resolution:—"That it is the strong opinion of this meeting that the system of weights, measures, and coinage at present in use in this country is inconvenient, anomalous, expensive, and detrimental to trade and commerce, as well as to the interests of society; and it is strongly urged that steps be immediately taken to introduce the metric system."

ILLUSTRATIONS of the soldering of aluminium by the process of M. LUDWIG OLIVEN were given at the offices of the Planet Electrical Engineering Company on Thursday, November 29. The details of the process were not made public, but it is stated that several articles were soldered so effectually that when sufficient force was applied to tear the metal, the joints remained perfectly firm.

At the examination for open science scholarships held last week at St. John's College, Cambridge, Mr. G. S. WEST, son of Mr. Wm. WEST, chemist, Bradford, headed the list of successful candidates, and was awarded a foundation scholarship of eighty pounds per annum.

THE chemists of Dumfries and Maxwelltown held a very successful ball, which was attended by over fifty couples on Tuesday night, the 11th inst. It was opened by Mr. WILLIAM ALLAN, local secretary to the Pharmaceutical Society, and president of the local association.

ON Monday last, Professor W. R. SMITH, Director of the Laboratories of State Medicine, King's College, and President of the British Institute of Public Health, was the recipient of a testimonial—consisting of a silver salver, tea service, etc.—presented by the Lord Mayor, at the Mansion House, London, on behalf of a number of gentlemen interested in medical science, who wished to show their appreciation of the services he has rendered to forensic medicine and during the recent meeting of the Public Health Congress, of which he was president.

Transactions of the Pharmaceutical Society of Great Britain.

BENEVOLENT FUND GENERAL MEETING.

ELECTION OF ANNUITANTS.

A General Meeting of the Members and Associates of the Pharmaceutical Society and Donors to the Benevolent Fund was held at the house of the Society, 17, Bloomsbury Square, on Tuesday, December 11, at 12 o'clock, for the election of four annuitants, Mr. MICHAEL CARTEIGHE, President, in the chair.

The notice convening the meeting was read by the Secretary, scrutineers were then appointed, who elected Mr. E. N. BUTT as Chairman, and proceeded to examine the voting papers.

On bringing up the report the Chairman said the Scrutineers who were duly appointed at the meeting for the election of four annuitants on the Benevolent Fund of the Pharmaceutical Society had examined all the voting papers which had been placed before them, and had unanimously agreed to submit the following report:—

Scrutineers' Report.

We, the undersigned Scrutineers, appointed at the thirtieth election of Annuitants on the Benevolent Fund of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following result:—

Board, Thomas F.	2616
Bromfield, Charles	4997
Ellis, Elizabeth	4834
Kershaw, Ellen	5881
Troughton, Christopher.....	3625
Watson, James B.	5317
Willison, Elizabeth A.	1641

4044* voting papers were received, of which number 73 were informal (48 unsigned, representing 172 voters and 25 incorrectly filled up, representing 66 votes).

EDWARD N. BUTT, Chairman.

W. PRIOR ROBINSON.	J. H. SHACKLOCK.
WILLIAM WARREN.	C. E. TURNER.
CHARLES J. MILES.	HENRY O. BIRCH.
W. MURTON HOLMES.	W. T. FROST.
R. FISHER YOUNG.	W. PICKARD.
A. E. TANNER.	R. O. FITCH.
T. P. GOSTLING.	JOHN HOLDING.
THOS. HENRY POWELL.	EDWD. B. STAMP.
HENRY BATE.	ALFRED WILLIAMS.
GEORGE WYLDE.	ALEX. BOTTLE.

December 11, 1894.

The PRESIDENT then declared the following duly elected Annuitants:—

Bromfield, Charles.
Ellis, Elizabeth.
Kershaw, Ellen.
Watson, James B.

The PRESIDENT moved a vote of thanks to the Scrutineers for their services, which was duly carried, and suitably acknowledged by the Chairman, Mr. E. N. BUTT, and, after a similar vote by the Scrutineers to Mr. BUTT for acting as Chairman, the proceedings terminated.

* 6337 voting papers were issued.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 12th inst., the Librarian and Curator presented the following report of donations to the Society's Libraries and Museum:—

To the Library in London.

Direkteur van s' Lands Plantentuin te Buitensorg :
Mededelingen uit s' Lands Plantentuin, Nr. 11-12.
Smithsonian Institution, Washington :
Annual report, National Museum, 1891-92.
U.S. Surgeon-General, Washington :
Index-Catalogue of Library, vol. 15.
Nova Scotian Institute of Science :
Proceedings and Transactions, ser. 2, vol. 1, pt. 3.
New York State Pharmaceutical Association :
Proceedings, 1894.
F. M. Bailey, F.L.S., Brisbane :
Queensland, Botany Bulletin, No. 9, 1894.
Philosophical Society of Glasgow :
Proceedings, vol. 25.
Chemists' Assistants' Association, London :
Proceedings, 1893-94. Two copies.
British Pharmaceutical Conference :
Year-Book of Pharmacy, 1894. Two copies.

To the Library in Edinburgh.

British Pharmaceutical Conference :
Year-Book of Pharmacy, 1894.
Mr. E. I. Macdougall, Leith :
Photograph of Edinburgh Chemists' Trade Association Picnic Party at Norham Castle.

To the Museum in London.

Mr. S. Sibthorp, London :
Specimen of *Santolina chamæcyparissias*, imported from France.
Messrs. Burgoyne, Burbidges and Co., London :
Specimen of Malambo bark.
Mr. J. C. Wright, London :
Seeds of *Magonia glabrata*.
Messrs. F. H. Faulding and Co., London :
Specimen of the natural oil of *Eucalyptus neo-ri-folia*, rectified, containing 65 per cent. of Eucalyptol; standardised oil of the same plant, containing 50 per cent. of Eucalyptol; Phosphate of Eucalyptol, and chemically pure Eucalyptol; Resin oil left after rectification; heavy oil obtained from the resin oil; Oil of *Eucalyptus odorata*, and heavy oil separated from the residual resin oil after rectification; natural oils of *Eucalyptus gonio calyx*, *E. incrassata*, and *Melaleuca uncinata*.
The Imperial Institute :
Bark of *Chiono glabra* from Trinidad.
Mr. D. Greenhough, London :
Specimen of Wheat thirty years old.
Mr. G. Curtis, Chiswick :
Photograph of fine specimens of Bryony root.
Mr. F. Ransom, Hitchin :
Specimen of spurious Belladonna leaves.
Messrs. Warriek Brothers, London :
Specimens of Ionone, Nerolin and Oil of Celery.

To the Herbarium.

The Imperial Institute :
Specimen of *Chiono glabra*.
Mr. H. N. Ridley, M.A., Botanic Gardens, Singapore :
Specimens of *Ageratum conyzoides*, *Alternanthera sessilis*, *Cleome halletii*, *Ficus apocarpa*, *Hedyotis congesta*, *Herpestis monniera*, *Melastoma polyanthum*, *Oldenlandia* sp., *Piper muricatum*, *Scoparia dulcis*, *Vitex vestita*, *Willoughbia firma*, *Citrus* sp. (Pamelo), *Plantago* sp., *Parkia* sp., the plant yielding "Getah serapat," "Siman Kasture" and "Siman Mendring.

EVENING MEETING IN LONDON.

The second evening meeting of the Session was held on Wednesday, the 12th inst., when the chair was taken by the President, Mr. Michael Cartledge.

The first paper read was by Sir Dietrich Brandis, K.C.I.E., F.R.S., on—

MEDICINAL PRODUCTS OF THE DIPTEROCARPACEÆ, an abstract of which appears at page 497.

Professor ATTFIELD, in proposing a vote of thanks to the lecturer, described Sir Dietrich Brandis as one of those rare men who observe accurately, and reflect and describe accurately. He had had opportunities such as had occurred to few men, and was thus able to give much useful information respecting the actual practice observed in the treatment of those trees.

Mr. CHARLES UMNEY, in seconding the vote of thanks, said that he had learned a great deal from the lecture. Now that students were studying the products of plants more than they used to do, the description given of the way in which the oleo-resin is formed in the different parts of the plant, and how the oil cells are divided, would prove exceedingly instructive. The tallow collected in bamboo tubes had been called attention to some years ago. It possesses the quality of melting at a very low temperature, slightly above that of cacao butter, and it will keep for a considerable time without becoming rancid, besides having little odour.

The PRESIDENT recalled the fact that a distinguished member of the Society, the late Mr. Daniel Hanbury, who devoted the greater part of his life to original work in materia medica, had studied wood oils very closely. Such a lucid and helpful lecture as the present would have materially assisted the Major candidates, who in the old days were rather terrified at the prospect of an examination in the subject by Mr. Hanbury.

The vote of thanks was adopted unanimously, and

Sir DIETRICH BRANDIS, in acknowledging the resolution, said that the late Mr. Daniel Hanbury had proved that true scientific research and excellence in practice might well go hand in hand. The young men who studied in the excellent School of Pharmacy established by the Society should bear in mind that any moment they might in their researches hit upon some discovery of lasting importance. Possibly in the Dipterocarps there might be some substance which would be of importance in dealing with disease, and its discovery might be the work of one of the youngest students.

Mr. JOSEPH INCH then read the paper on—

"THE SPAGIRISTS,"

which is printed at page 499.

On the motion of the PRESIDENT, a vote of thanks was accorded for the paper.

Mr. E. M. HOLMES then read his—

NOTES ON OPOFANAX AND EUCALYPTUS OIL,

which are printed at pages 500-501.

Mr. PAYNE said he had for nine months been engaged in the distillation of eucalyptus oils. He was not prepared to state the composition of the oils of the 180 different species existing in Australia, but he knew something of the composition of two of them. Many samples had been produced, derived from the different distillates and the various separate principles. The chemistry of eucalyptus oil was one which would occupy

a very large amount of attention, owing to the great difficulties attending the examination of essential oils generally as now known, but, for the first time, pharmacists were now given eucalyptol in a state of absolute purity, which could be prepared from the phosphate of eucalyptol. Unfortunately, there was an enormous amount on the market at present. One sample had been produced that night of eucalyptol, so-called, which did not contain more than 75 per cent. of pure eucalyptol, and was deficient in its specific gravity. There were five or six other different kinds of eucalyptol. It was present in every kind of oil, the percentage being in every instance above forty-five and never above fifty-five in the samples examined by him.

Mr. UMNEY said that in the port of London eucalyptus oil seemed to be judged mainly by its odour. From the chemical point of view, it was well that they should be able to handle a substance of which they really knew something. They knew now that there was such a substance as eucalyptol, and that it could be prepared by several processes. The old-fashioned process, which he had used in his laboratory, was to digest with caustic potash, rectify, and separate at a boiling point of about 175° C. The process described in the paper was very excellent, simple, and inexpensive, and, if it were true that it would give eucalyptol of exceptional purity, that was the process to go for. Personally, he rather objected to a standardised eucalyptus oil, because it was certain to vary; the eucalyptol might be constant, but there would remain the varying odours; it would be preferable to keep simply to eucalyptol. Mr. Umney then referred to the report on this subject from Australia, recently appearing in the *Pharmaceutical Journal*, and said that the solid substance or gum obtained from the eucalyptus was undoubtedly valuable, but he was not prepared to say whether rectified eucalyptol had the efficacy attributed to it, from a medicinal point of view. In fact, one could not help, in reading this correspondence, suspecting that our good friends the colonists had their own axe to grind in seeking to put eucalyptus oil into the Pharmacopœia.

Mr. ALLEN remarked on the differences in the physical characteristics of the various eucalyptus oils. According to his experience, no single thing in the Pharmacopœia caused so much trouble to the pharmacist in the compounding of remedies as eucalyptus oil. It would be a good thing if we could either deal solely with eucalyptol, or with some standardised oil that would have at least an approximation to a general characteristic odour.

The PRESIDENT said that it was a considerable step to have got something as definite as eucalyptol, and, when experiments had been made upon it with oxidising and reducing agents, still more satisfactory knowledge would be acquired. He believed that a very large part of the therapeutic effect, whatever that might be, was common not only to eucalyptus but to a number of other oils. He proposed a hearty vote of thanks to the reader of the papers.

Professor ATTFIELD, in seconding, said that, as a chemist and a scientific man, he welcomed eucalyptol, but, as an editor of the *Pharmacopœia*, he considered they had not as yet very definite information about the new article. So far, pharmacists and chemists had done even more than could have been expected of them in connection with eucalyptus oil; they had gone ahead of the therapeutists, and the next movement ought to be made by the medical pharmacologists.

The resolution was carried unanimously.

Mr. HOLMES, in returning thanks, said the main object of his paper was to show that in eucalyptol there was a definite subject for pharmacologists to deal with.

The proceedings then terminated.

Proceedings of Societies in London.

CHEMICAL SOCIETY.

A meeting of the Chemical Society was held on Thursday, December 6, the President, Dr. Armstrong, F.R.S., in the chair. The following papers were read:—

THE USE OF THE GLOBE IN THE STUDY OF CRYSTALLOGRAPHY.

BY J. Y. BUCHANAN, F.R.S.

The author described the use of the globe in the study of crystallography, it being so arranged that lines and geometrical figures could be traced on the surface and the globe rotated in any direction; then by suitable means the lines obtained projected on to a plane surface.

Lantern slides were then shown by Miss Walter and Mr. Bourne, and described by the latter, of an apparatus exhibited at the conversazione of the Royal Society for applying the above method to the actual measurement of crystals.

The next paper was on

THE RELATIVE BEHAVIOUR OF CHEMICALLY PREPARED, AND OF ATMOSPHERIC, LIQUID NITROGEN.

BY PROFESSOR DEWAR, F.R.S.

When gases, such as nitrogen, oxygen, or air, are liquefied in large quantities, the impurities present in the gas interfere with investigations on their relative behaviour at low temperatures. When liquefaction occurs, the impurities—which may be water, carbonic acid, or organic vapours from the pumps—accumulate, and ultimately are found admixed with the liquefied gas in the solid state. When the impurities, which may amount to 1 per cent. in liquefied air, separate as a solid, filtration may be used to separate the solid from the liquid, but this method does not give a perfect separation owing to the difficulties in filtration at such low temperatures. If smaller quantities of gas as previously purified by chemical methods are used from a gas holder, by the use of rubber tubes, tanks, etc., the traces of moisture are found which cause opalescence on liquefaction and thus vitiate results. By the use of a special apparatus, however, small quantities of perfectly pure and dry gases may be examined, and, furthermore, the experiment repeated as often as desired with the same specimen of gas.

The apparatus used consists of an ordinary distilling flask with a side tube. A capillary tube is sealed on to the mouth of the flask, and bent so as to have the free limb parallel with the neck of the flask. The flask containing phosphorus pentoxide is first exhausted, the pure gas introduced under known conditions of temperature and pressure, and the flask then sealed. In order to examine the relative behaviour of two gases at low temperatures, two flasks are taken, filled with the two gases under similar conditions, and the capillary tubes are inserted through a cork into a vessel containing liquid oxygen. This vessel is then partially exhausted, the oxygen begins to boil off, a reduction in temperature ensues, and the behaviour of the condensed liquids in the capillary tubes is carefully noted.

In this way any two or more gases can be compared, and the temperatures noted at which they liquefy, as well as their behaviour on suffering fractional distillation when the temperature is raised.

During this liquefaction in the capillary tube there is a reduction of pressure in the flask, and this might be measured by attaching a manometer to the side tube of the flask instead of sealing off.

If, however, such liquid gases are always compared with oxygen and the variations in the vapour pressure determined there is no need for the attachment of a manometer. Knowing the pressure at which the gas is introduced and temperature of liquefaction, it is possible to calculate the pressure by drawing the curve, of vapour pressure, and comparing with oxygen, and in this way we obtain the vapour pressure of the liquefied gas at the given temperature is obtained.

When pure nitrogen (either made from air or from various chemical compounds) and pure oxygen were examined by this method, no solid was obtained, proving that the substance obtained from air must be an impurity. Nitrogen made by the ordinary method of passing air and ammonia over copper always contains oxides of nitrogen.

An examination was now made of nitrogen obtained from different sources, that had been passed over hot magnesium which would combine with some of the nitrogen and either give up a gas as impurity or not absorb any impurity in the nitrogen.

By this method experiments were made on nitrogen from air, and nitrogen from ammonium nitrite, nitric oxide, or which had been passed over hot magnesium.

The residual gases appeared to behave almost exactly alike on liquefaction, the nitrogen from the air liquefying at a slightly higher temperature than the other samples. The difference is, however, extremely small. The conclusions, then, point to one of three possibilities:—

(i.) The nitrogen from the air contains no marked impurity of higher working point than nitrogen.

(ii.) Nitrogen, and the impurity or other substance contained in nitrogen from the air, have the same boiling point.

(iii.) The impurity does not liquefy at 200°.

With this apparatus it is also possible to examine gases under different pressures, and to observe the liquefaction of air, when it is found that the oxygen liquefies at about 1° above the temperature of liquefaction of nitrogen.

The next paper described a NEW METHOD OF PREPARING DIHYDROXYTARTARIC ACID.

BY H. J. H. FENTON.

In continuation of his previous researches on the oxidation products of tartaric acid by hydrogen peroxide, the author found that dihydroxytartaric acid is easily prepared by oxidising tartaric acid by bromine water and acetic acid. He also proposed to make use of the sparing solubility of the sodium salt, as a qualitative test for sodium. The acid is dissolved in water, and, on adding a weak solution of a sodium salt a white crystalline precipitate is produced.

he last paper read was on—

ESSENTIAL OIL OF HOPS.

BY A. C. CHAPMAN.

Further investigation of this oil shows that by fractional distillation under reduced pressure three products are obtained:—

(i.) A hydrocarbon giving figures on analysis for formula $C_{10}H_{17}$, but which is probably a mixture of hydrocarbons of formulae $C_{10}H_{16}$ and $C_{10}H_{18}$, the latter being probably a tetrahydrocymene.

(ii.) A very small fraction of hydrocarbon $C_{10}H_{18}$.

(iii.) The sesquiterpene, $C_{15}H_{24}$, before described (*Proc.*, 93, 177), which does not appear to be identical with any hitherto described. It contains two dyad carbon atoms, and yields a crystalline compound with nitrotyl chloride, and an unstable hydrochloride with hydrogen chloride. The physical constants obtained were in accord with above conclusions.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, December 6, a paper was read, entitled—

CAN WE STOP "COMPANY" PHARMACY?

BY H. B. CARE.

It was pointed out that the present state of affairs with regard to the competition of stores had been foreseen as long ago as 1869, but, in spite of all attempts to thwart it by those who saw the danger, it had steadily grown, and been fostered in many cases at the hands of pharmacists themselves, who had taken up "cutting" without being in any way compelled. The greatest attempt against it had been made by the Pharmaceutical Society in the famous prosecution of the London and Provincial Supply Association; and the result of that and other cases had shown that the pharmacist was only privileged with respect to the twenty-six articles in the Poisons Schedule, and that the law gave no monopoly in the sale or compounding of even these, caring only for the safety of the public. Nor could it be shown that safety was less ensured in the pharmacy of a company than in that of any individual pharmacist. All that could be done to obtain fairer legislation would be to ask plainly for greater privileges; but the hope from this was frail, as so few were in sympathy with the pharmacist, many people even now believing that his average profit was ninety-nine per cent. It was suggested that there were only two ways of making company pharmacy impossible—one, by controlling the supply of drugs; the other, by forming a trade union of all the chemists on the Register. Experience had shown that it was impossible to carry out the former method, while, as to the latter, even supposing that ninety per cent. of all qualified chemists joined a trade union, the only result would be an easy opportunity to the remaining ten per cent. to make their fortunes.

In the discussion which followed, most of the members agreed that the pharmacist of the future would have to depend on the confidence he could inspire in his personality.

At the meeting held on Thursday, December 13, a paper, of which the following is an abstract, was read:—

THE FUTURE OF PHARMACY.

BY H. A. D. JOWETT, B.SC.

Pharmacy at the present time occupies an anomalous position which forbids all comparison or analogy with any other trade or profession. It is both a trade and a profession, and this combination at present yields unsatisfactory results. The pharmacist has to face and meet the competition common to all trades, and at the same time to render professional services which require the application of varied knowledge. As a result, he is viewed by the public as a tradesman, and his remuneration is fixed accordingly. That this is so is proved by the status of the men attracted to pharmacy, by the social status of the pharmacist, and by the pecuniary inducements held out to assistants.

The present unsatisfactory condition of pharmacy may be referred then to two causes. First there is that arising from the trading part of pharmacy; here as in other trades the pharmacist is subject to the keen competition due to the present state of over-production and unequal distribution of population and wealth.

Then on the professional side the causes are many. Dispensing is now frequently done by doctors themselves, and sometimes it happens that in addition to dispensing the doctor sells such articles as chest protectors and proprietary medicines. Then there is the excess of supply over the demand for pharmacists, and lastly, but not least, the incompetence of the average pharmacist himself. He is not, as a rule, educated up to a professional standard, and consequently the public judge accordingly, classify all pharmacists from the few they come in contact with, and the result is that they occupy a similar position in the public esteem to a grocer or draper. Advertisements for a dispenser whose wife will cook and attend on the medical officer, or offers of the magnificent salary of £104 yearly to Major men, only prove conclusively that the pharmacist is not viewed as a professional man, and his remuneration is fixed accordingly.

Then how will these causes affect the future of pharmacy? In answering this question we must divide it into two headings—(1) the future of the trading part, (2) that of the professional side. With regard to the former, there can be little doubt that the day of the small tradesman is past. In future we shall see further developments of the store system, then these will be brought into competition with each other, and ultimately they will probably be taken over by the nation and managed by them as gasworks, waterworks, &c., are now managed. In the case of trading, pure and simple, it is obvious that the fittest in the struggle will be those with the greatest capital and turnover, and they accordingly will survive.

On the professional side, however, the personality of the pharmacist must for ever be the most potent and the determining factor. His services will be in requisition, and his remuneration determined by the amount of confidence reposed in him by the public.

There is always a demand for the best advice, and here the individual is master of the situation, and only on this side is there any hope for improvement in pharmacy. But if the future pharmacist is to attain this position he must recognise at the outset that he is entering a profession and about to incur all the risks attaching thereto.

He must be prepared to go through a long course of training and to acquire very varied experience before he can hope to make a bare living, and according to the time spent in the acquirement of such knowledge and the power of applying such, so will he possess the confidence of the public and be likely to succeed in life. He must possess a much better general education than is required now, and above all he must learn to adopt professional methods; he must not cover the rocks and country side, or even Nelson's monument with advertisements. Such procedure may be legitimate trading, but it is not professional.

In fact, the future pharmacist, if he is to maintain his individuality and not become a servant of a limited company, must "become a scientifically educated technical expert entitled to professional fees for his professional services."* "He must be equally well prepared for the best professional service at the prescription table, to aid the physician as the chemist of the medical profession, to act as public analyst, to undertake the work of the manufacturing laboratory, or for any related technical pursuit."† He must, then, retain all the professional element that he now possesses, and, in addition, regain much purely professional work, such as analysis, which has slipped away from him owing to the incompetence and lethargy of former pharmacists. But here let me warn you that you will come into competition with another body of chemists who, differently trained, are nevertheless equally competent to undertake similar work as analysts.

It may be urged that this kind of work is limited, that the supply is already in excess of the demand, and that may be so; but what trade or profession is not overcrowded? All depends on the individual himself. There is always room for the best; and the leaders in any profession, be they chemists, doctors, or barristers, are overloaded with work, whilst the struggling crowd of mediocrity have none.

Finally, does future legislation hold out any hopes for the future pharmacist? I think it is quite certain that you will never be able to stop company pharmacy, nor would it be just, so long as companies employ duly qualified men. The number of scheduled poisons may be extended, but one can hardly look on the selling of poisons as professional. Dispensing will, I am afraid, continue to be done by doctors, for there are many people who cannot afford to pay both doctor and chemist. The title may be protected, for it is possible that legislation will be enacted for the proper use of all scientific titles, and the chemist might well be included.

What, then, will be the position of the future pharmacist divorced from trade?

With pharmacy recognised as a profession, requiring a long course of study in the attainment of proficiency, and constant new application of knowledge already gained, those who follow it will be respected by the public, and may then hope to obtain professional remuneration for their services. The physician will recognise in the pharmacist a fellow-worker in science, will regard him as a helper, and we shall then see more cordial relations between these closely allied professions.

Lastly, but not least, with increase of professional spirit we shall see the death of that petty jealousy so general amongst us nowadays; we shall see pharmacists banded in a society, the present one, I hope, but greatly increased in numbers, striving not only for self-protection, but for the furtherance of knowledge amongst themselves, and thus in the application of such will there be advantage to the human race.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, November 29, H. T. Durant, vice-president, in the chair. A paper on the history of the word "Chemistry" was read by C. S. Ellis, who gave several possible derivations, among which he instanced *Chema* as the tradition relating to the arts taught by the sons of God to the daughters of men before the deluge; from this it came to be more particularly applied to the art of making gold. An ancient name of Egypt was *Chemia*, on account of its black soil, and the word was also used to designate the pupil or black part of the eye; hence it may have come to signify the black or mysterious art. The Arabic *Kema*, to hide, and the Greek *Chao*, to melt, or *Chymos*, juice, were also given as very probable origins. Whatever the original root may have been, it came to us through the Arabic, as shown by the prefix *al*, which was used with it during the Middle Ages. A discussion followed, in which the Chairman, Secretary, Messrs. Maunder, Read, and Goulding took part.

A paper on Sugar was then read by Sidney Davis, who gave a full description of the manufacture of sugar from the sugar-cane and beet, and the processes used in refining; other commercial sugars such as glucose and sugar of milk were also treated of more briefly. The paper gave rise to a discussion, in which the Chairman, Messrs. Read, Moore, Smith, and the Secretary joined.

The Secretary announced that the Executive Committee had appointed the following Reporters on Science:—Pharmacy, W. Moore; Botany, E. Goulding; Materia Medica, C. J. Taylor; Physics, H. T. Durant; Organic Chemistry, C. S. Ellis; Inorganic Chemistry, A. T. Hill; Analytical Chemistry, R. G. Guyer.

The meeting then adjourned.

SMOKING CONCERT.

The annual smoking concert of the football and cricket club in connection with the Association was held in the council chamber at the Holborn Restaurant, on Tuesday, December 11.

Professor J. Reynolds Green, Dean of the School of Pharmacy, occupied the chair, and was supported by Messrs. C. B. Allen, Alexander Bottle, Thomas Greenish, and Walter Hills, members of Council; Professor Greenish, Dr. Harding Bremridge, Dr. Ince, Messrs. Bateman, Birch, Richard

* Dr. O. Oldberg (*Pharm. Journ.*, ante, p. 211).

† Extract from a pamphlet issued by North-Western University, Chicago, U.S.A. (*Pharm. Journ.*, ante, p. 211).

Bremridge, Butt, T. E. Greenish, Joseph Ince, Robinson, Short, Warren, and Edmund White.

The programme, which was prepared by Mr. L. D. Simpson, was well appreciated. Among the items it included were Balfe's "Excelsior," the rendering of which by Messrs. Coles, Webb, and Stewart Beckley was much applauded. Tosti's Venetian song by Messrs. L. D. Simpson and W. J. Hands was also much appreciated. The recitations of Mr. Edward Minshall met with great favour, as also did those of Mr. Robert Watts, and the comic songs of Mr. Alan Dale were enthusiastically encored, but owing to the length of the programme, could not be repeated.

Messrs. G. W. Allen and E. J. Eastes, assisted by others, gave great satisfaction as accompanists.

At the close of the proceedings the Chairman asked that the thanks of the meeting be accorded by acclamation to those who had organised the concert and contributed to the entertainment. Mr. Moore called for a similar vote of thanks to the Chairman, which concluded a very pleasant evening.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on Thursday, 13th inst., Mr. Jas. Robb was called to the chair, and the following paper was read:—

ALL ROUND THE B.P.

BY ALEX. LAING.

For the first time in the history of pharmacy, pharmacists are afforded an opportunity of airing their opinions on those substances and preparations the medical profession is desired to recognise as standard medicines, which it is chiefly their duty to make ready. It is a responsible position, for it is not our province to know the influence of drugs upon the system, and how we are to offer an intelligent view unless such knowledge is allowed it beats me to understand. In doing that, as I intend just now, I am content to hide myself as a pharmacist, and touch the different points as a spectator who has some interest in the rise and progress of the art and practice of medicine from an increase-of-general-knowledge point of view, and my observations carry no weight but such as my appeal to the sense of those who are the judges.

There are some statements I feel called upon to make, quite apart from the Pharmacopoeia, yet more important than what I have to say with reference to it, for we have duties in respect to the public generally as well as to the medical profession, and though it sounds nice to hear it said, "the public must be protected," I would like it to be shown that it is entirely honest. I hold the same opinion as Dr. Johnson, who was a metaphysician, that a man of forty years is either a fool or a physician, inasmuch as by that time he ought to have an intelligent perception of the functions of the organs in the human body, and he ought to know what is hurtful to himself. The use of drugs gets beautifully less amongst the more intelligent classes in the community, while the abuse of drugs, kindly fostered by the laws relating to patent and proprietary medicines (save the mark)! grows beautifully greater. And any effort made to educate the public towards a definite standard combination of drugs for a definite purpose is directly

frustrated by the Board of Inland Revenue. Even ipecac. and squills, recommended for a child's cough, would be "liable to stamp duty." It should be our duty, and the duty of the medical profession as well, to stamp the other duty out, and I wish the medical profession would read some of the pamphlets relating to these patent nostrums and learn from them what influences the mind or imagination can have in persuading ignorant people to get well when a gentle stimulus to the bowels or kidneys is given. But for their ignorance they would not have been reduced to such wrecks as their testimonials make them; and either we should endeavour to dispel that ignorance, or they should die right off, and save humanity from the quacks and charlatans who thrive on its fears and credulity. The 'Family Physicians,' written for the public by eminent medical gentlemen, are hardly so mischievous, because in serious cases or in symptoms of fever they are not relied upon. But they are useless for the purpose of instructing humanity or the heads of households in those simple preliminary attacks of illness that may mean anything or nothing—in which a stitch in time may save nine. Accounts of the courses of fevers are not for family application, and may mislead more than help.

I think, too, some remarks on the bacteria fad, which is so much with us at present, will not be amiss. Bacteria we have had always with us, and, taken all in all, they are not only harmless but purifying, inasmuch as living organisms are better than putrid matter. With a healthy mind in a healthy body, the deadliest microbes can get no hold; and in surgical cases the process of healing is from within, therefore the first aim should be to strengthen the system. Possibly the daily press misrepresents the medical profession in the wretched attempts it makes to inform the general public of scientific researches in the world of medicine, but the authorities from whom the information is derived ought to study their words and use them with strict regard to their legitimate meaning.

Just now there is great activity in experimenting with serums and glands from each and every part of the animal economy, and injections of these are to work a revolution on the body of a long-suffering humanity. It is to me a disgusting piece of foolery, which I would infinitely prefer to die rather than submit to and live. Let us learn to eat pure, and drink pure, and breathe pure, and think pure, and all those serums and condensed animals and animalcules may be sent to the British Museum to show future generations what stupid and abject methods were prosecuted to prolong life.*

Under present conditions we cannot expect the highest service from the individual physician, as the "first law of life" claims too much attention; and until that is remedied by making him an official in the State, a parish doctor, *in extenso*, not much progress will be made in educating humanity how to keep well and die gracefully.

My remarks directly on the B.P. are only of a general character, as several opportunities will be afforded during the session of approaching it more closely.

I would like, in the next B.P., a better recognition of apothecaries' weights, even to replacing the present *avoirdupois* in tinctures, and every other preparation.

It would be well, as an introduction to the metric system, to put the alternative quantities in grammes and litres. With the solutions of strychnine, etc., altered from 1 grain in 2 fluid drachms in the previous edition to 9 grains in 2 fluid ounces, I have never felt sympathy, as our standards of measure were more in accord with the 1 in 120 solution. I remember several letters appearing in the Journal referring to a deposition of crystals in liq. strychnine, which I could only account for by assuming that the alternative quantities in parts were the source of an error; one part of strychnine being taken as one drachm, instead of one eighth of an ounce. With the metric system that could not happen.

The pills in the B.P. seem to be there for an illustration of what to avoid in prescribing, as they are more honoured in the breach than the observance. They are generally too big at five grains in each, and only *pil. rhei. co.*, ruined in shape by glycerin, and *pil. colocynth et hyos.*, with ext. coloc. co. preferred to mass *pil. coloc. co.*, have much attention paid to them. A mode of coating should be approved by the Medical Council, and that suggested and used by Martindale is simple, efficient, and elegant.

Infusions in a concentrated form would be an advance; macerating at first with water containing sufficient spirit to preserve the finished product; percolating until a certain quantity was collected to be set aside; the marc exhausted with water; and the percolate evaporated, until, on being added to the spirituous percolate, the desired quantity was made.

Tinctures also should be made by macerating in sufficient spirit to exhaust the various ingredients of their active virtues, and percolated until, having ceased to drop, the last of the fluid can be expelled by water to make the requisite bulk. In these days of total abstinence and liquor traffic agitation, we could assist the community by adopting the happy medium of reducing the quantity of spirit to the least necessary, and at the same time circumvent the increased duty on spirits inflicted upon us by a grandmotherly government. With rectified spirit tinctures, such as *cimicifuga* and *myrrh*, we would soon know to a nicety how much could be expelled from the marc before the water mingled, and sufficient spirit added before the water would entirely do away with the tincture press.

I hope the coming B.P. will give us a series of syrups to redeem us and the medical profession from the legion of "distinctions with no difference" we are obliged to keep to suit the idiosyncrasies of different prescribers, including a syrup hypophosphites co., and Easton's syrup. Both of these are troublesome to the retail chemist, but I hardly approve of the public being supplied on demand, especially with the latter. Containing strychnine, they come under the first schedule of the Poisons Act, but if made with an equivalent quantity of *nux vomica* extract, they would

fall under the second, and a simple poison label fill all the claims of the law; besides, the colouring matter in the *nux vomica* would disguise the iron oxidation which makes Easton's syrup unsightly on keeping any length of time.

Pulv. rhei. co. should be recognised made with heavy calcined magnesias as well as light.

Pil. plumbi c. opio and all the horrid astringent tinctures and powders of the catechu calibre, should be blotted out as relics of a barbarous age.

If the object of negative tests is indicated in the future by the words "absence of so-and-so" it will be of great assistance to budding pharmacists; and some negative tests, especially of oils, would not be amiss.

Finally, here is a list of things I would like omitted as effete relics of barbarism, which I would part from without one tear of regret:—

All synonyms excepting "cream of tartar," *sal. ammoniac*, and for *theriac*, golden syrup.

Aqua aurantii floris.

" *carui.*

" *feniculi.*

" *menthas viridis.*

" *pimentas.*

Armoracia radix et spt. armoraciae co.

Beberina sulph.

Belas fructus et extract belas liquid.

Cambogia et pil. cam. co.

Canellae cortex.

Cassiae pulpa.

Confectio opii.

" *piperis.*

" *rosae gallicae.*

" *scammonii.*

" *terebinth.*

Enema terebinth.

Extract. anthem.

" *calumbae.*

" *krameriae.*

Mezereon and its preparations.

Ext. papaveris.

Pareira. (?)

Ext. quassiae.

Rhamus frangulae

Extractum ejusdem.

Ext. rhei.

" *sarsae liquid.*

Glycerin acid gallic.

Glycerin tragacanth.

Hemidesmi. radix. et syrup.

Inf. aurantii.

" *catechu.*

" *ergot.*

" *krameria.*

" *maticae.*

Pil. scammonii co.

" *scillae co.*

Potassa sulphurata.

Pulv. catechu co.

Staphisagris ungt.

Sumbul. radix. and tincture.

Suppositoria cum. sapone.

Vin. aloes.

Vin. ferri.

Vin. rhei.

Conii fructus.

Cusparia cortex et infus.

Decoctum sarsae.

Elemi et ung. elemi.

Emp. ammoniaci c. hydrarg.

Emp. opii.

" *plumbi iodidi.*

Enema asafetidae.

Inf. rhei.

" *valerianae.*

Laricia cortex et tinct.

Liniment hydrargyri.

" *sinapis co.*

Liquor iodi.

Lotio. hydrarg. flav.

Manna.

Marmor alb.

Mastiche.

Maticae folia.

Mist. ferri. aromat.

" *scammonii.*

Mori. succus.

Moschus.

Nectandrae cortex.

Ol. mentha viridis.

" *rutae.*

" *sabinae.*

Pil. plumbi. c. opio.

" *saponis co.*

The Chairman, Mr. Robb, in inviting members to give their opinions, said Mr. Laing's ideas would commend themselves to students generally, and there would not be much of the B.P. left if his advice were followed.

Mr. Boyd considered that the study of bacteria was likely to increase. He mentioned the decrease of the death-rate in hospitals since the introduction of the antiseptic treatment. Treatment by glands was a new production, but castor, which was dropped in the last B.P., was still in use, and he had dispensed it recently. Extract of thyroid gland, and of the suprarenal capsule were used with good effect in cases of myxodema and Addison's disease, but it was a question more suitable for doctors to decide. Ememata of asafoetida and turpentine were still in use. In pills we might have a useful formula for pil. phosph. co., which was often prescribed. There was a superfluity of syrups, such as mulberry and hemidesmus and an absence of syrups very much prescribed. The change in the strength of the liquors of the present B.P. was not a good move. It was easier to remember 4 grains to the ounce, and easier every way. Dropping troy weight had complicated matters, but the metric system was not so good as avoirdupois, it was easier to write grains $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, than the decimals, as the mind could better grasp a vulgar fraction.

Mr. R. Brodie was averse to discarding preparations from the list, as he liked to have the formula of anything in demand convenient to his hand. He also disapproved of the metric system, and was in favour of troy weight.

Messrs. Russell, Bruce, and Blair also took part in the discussion, and, in concluding, the Chairman asked for a vote of thanks which was unanimously accorded.

Provincial Transactions.

CAMBRIDGE PHARMACEUTICAL ASSOCIATION

A very successful smoking concert was given by the members of this Association and their friends in the Alexandra Assembly Rooms, Cambridge, on Friday, November 30. Mr. Alderman Deck, acted as chairman, and there was a very interesting programme, in which Messrs. R. Cope, A. A. Walker, H. T. Wing, Markham, F. Dale, E. T. Rider, A. R. Hill, E. H. Church, H. Clare, P. S. Campkin, W. L. White, H. Bryan, and A. Plumb took part. At the conclusion of the programme, most of the performers having been encored, votes of thanks were passed to the chairman and performers, especially to Mr. E. H. Church, who had arranged the concert.

PLYMOUTH, DEVONPORT, STONEHOUSE AND DISTRICT CHEMISTS' ASSOCIATION.

JUNIOR SECTION.

The monthly meeting of the above was held at the Foresters Hall, Octagon, on Thursday 6th inst., at 8.30 p.m. Among those present were Messrs. F. A. Goodwin, Chairman, H. O. Westcott, Secretary, Wood, Fisher, Newman, E. T. Cocks, Whitclock, Dendney, Hodge, Darke, Downing, Fairweather, Barber, and Buckner. The members regretted receiving the resignation of Mr. F. A. Goodwin, who had so ably filled the chair, and was leaving the neighbourhood. Mr. E. H. Newman was elected to occupy the same. At the conclusion of the general business, an interesting paper on "Volumetric Analysis" was read by Mr. F. A. Goodwin and illustrated by experiments. He estimated liq. soda chlorin., sp. ether nit., etc. At the close a vote of thanks to the author was passed for his instructive paper, proposed by Mr. E. H. Newman, seconded by Mr. E. A. Hodge.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

A meeting of the Manchester Pharmaceutical Association was held on Wednesday, December 12, at the Victoria Hotel, Manchester. Mr. G. T. Woolley presided, and the attendance was large.

The President, in introducing Mr. Taylor, mentioned that there was with them this evening Dr. Paul, editor of the *Pharmaceutical Journal*.

The following paper was then read:—

A PHARMACEUTICAL WANT LIST: AN ADDRESS ON TRADE TOPICS.

BY JOHN TAYLOR.

The list I lay before you I have compiled myself. It does not profess to contain all the things we want, nor are you to infer anything as to the relative importance of the items from the places they occupy on the list. In considering our wants, I speak, of course, primarily for myself. Still, I think I shall voice the sentiments of many pharmacists, both present and absent. I cannot claim novelty for any of the topics, or newness of treatment either. I only ask you to believe that, in responding to the call of our Secretary for an article on trade matters, I have a sincere desire to aid in the supplying of our wants.

Our first want is a stringent first examination. I shall not say much on this question as you discussed it at your last meeting. But I wish to notice the objection usually raised to an alteration of the Preliminary. It is said the prospects of the drug trade do not warrant the mental and monetary cost of a severe first examination. The trade is "not worth it," is the phrase used. That, I submit, is a view of the matter which concerns us who are in the trade very little.

It is, however, a point well worth the consideration of those who wish to enter the trade. Our object is to lessen by all fair means the number of qualified competitors we must meet. Not only that, but to secure that all who do come in shall have reached an educational status which will do justice to, and bring honour upon, the pharmaceutical body.

The existence of a well educated, highly skilled body of pharmacists may not necessarily lead to increased profits or lessened outside competition; but I am convinced that if the education and mental calibre of the body of pharmacists does not command public respect we shall never get the public to meet such of our wants as can only be met by legislation.

We want equality in membership of the Society. At present, as you know, the Council of the Society (its legislative and executive body) consists of twenty-one members. These are elected by a constituency in which obtains the principle of "one man, one vote." So far all is well.

The suggestion that the members who retire annually should do so in rotation instead of by ballot is a good and sound one. In matters of this kind nothing should be left to chance.

But whilst there is equality of voting power and subscription paying, there is a difference of status as regards other things, notably as to membership of the Council. Two-thirds of the Council must be pharma-

ceutical chemists, the other third being chemists and druggists. The inequality is greater than at first sight appears, for the third, consisting of chemists and druggists, must be men who were in business when the Act of 1868 was passed. So then, whilst the youngest pharmaceutical chemist on the Register is eligible for the Council if he subscribes, it is, as regards chemists and druggists, a case of "no young men need apply."

This is a grave inequality. The number of chemist and druggist members is constantly dwindling, and time alone is throwing the affairs of the Society into the hands of the pharmaceutical chemists entirely. So you have this state of things—that a large number of subscribers (considerably over one-third of the whole) have no right to sit on the Council. They pay a subscription equal to that of any member of the Society, but are denied any direct representation on the Council. This is neither fair nor wise. It is unfair because, where all pay alike, there should be disabilities imposed on none. It is unwise because disqualification invariably brings on discontent or indifference, or both. It bars out every Associate, no matter how able or willing he may be to serve on the Council. Whatever a man's qualification may be—if he has lacked time or money or ability to pass the Major—he may not aspire to a seat on the Council unless he was in business in 1868—that is, unless he has probably seen the best of his days. A trade union which reserved a majority on its executive body to one section of its members would soon cease to exist, and rightly so. A man will serve his fellows with more zeal if he has an outlet for his ambition, surely a laudable one when it leads him to serve his brother-craftsmen. We Associates are denied that outlet for our ambition, if we have it. Our part is strictly limited to payment and criticism. Under such circumstances the criticism is apt to become harsh and unreasonable.

I feel confident that until our Society is put on a thoroughly democratic basis, as well as to qualification for office as to voting power and subscription, we shall meet with discontent and apathy on the part of the trade.

Here let me anticipate possible criticism from pharmaceutical chemists. I would not have gone so much into this question if it had not been that I know many Major men are jealous of any interference with present arrangements. It is not the title of pharmaceutical chemist we want. There may be on the part of some a desire to place those initial letters after their names. I am not of the number. I do not care the proverbial "tinker's curse" for the title of Ph. C. or any title which I have not earned in a fair and legitimate way. If as a "man" I have not a right to a position, I do not want it on any other ground.

What I want—may I not say what we want—is not a title, it is the reality of power. We can have that without robbing any man of his rights. We want to meet, as regards the working of the Society, on perfect equality. Equality of subscription, equality as members, equality in having the right to fill any office to which the constituency may think it proper to elect

us. Give us these things, and, as regards titles of honour and merit or scholarship, let them go to the men who honestly earn them.

You will gather from this that I do not think the pharmaceutical chemists have a prescriptive right to any given number of seats on the Council. I do not. Their title always being safeguarded and maintained as an honourable distinction, I do not see that they have any rights or interests superior to those of the humblest associate in business. I recognise only one title to a seat on the Council—that given by a majority of votes. I believe that if this principle of equality had obtained all along, much of the difficulty, indifference, and discontent on the part of the trade would never have been met with.

Another thing we want is the power to remove a chemist's name from the Register. As registration bestows certain privileges (not worth much just now) on a man, it is only fair the public shall have some guarantee that these privileges shall be rightly used. It is fair, too, that a man's colleagues should have the right to expunge his name from the trade roll if he act treacherously towards, or disgrace his calling.

A power like this would need to be safeguarded and used judiciously. The Legislature, if it grant us this power, will see to that.

We have already power to expel a man from the Society; it needs to be supplemented by power to remove his name from the Register.

One or two local associations have busied themselves with drafting a code of pharmaceutical ethics. They may spare themselves the trouble. If they will help us to get this want supplied, then round the power to expel a man from our Society, and to disqualify him, or suspend him from practising as a pharmacist, a code of ethics will soon begin to grow.

The next of our wants I shall notice is one on which there is probably greater difference of opinion than on those last noted. It is the dividing of the constituency into districts. At present, in electing a Council, the subscribers to the Society vote as a single constituency. The result is that we all vote more or less blindly as regards the candidates. Thickly peopled cities like London, Birmingham, and Manchester, can always put in their man. To get that result, they often have to forego voting for any other candidates, however good they may be. Only a comparatively small portion of the electorate vote at all, the rest care too little about it. They have come to feel it makes little difference.

Now, without attempting to draw up any scheme of district representation, let me point out its advantages. If the country were divided into, say six districts and a representation of Councillors allotted to each on some fair plan, it would be possible for candidates to get personally into touch with their constituents. At a small expenditure of time and money, the candidates could address meetings of the trade in a few centres. This, by interchange of opinion, would enable the voters to form a fair estimate of the qualifications of the man who sought to represent them. The candidate, on the other hand, would get a first-hand knowledge of the wants of the trade, as such wants are felt

by business men of a class different from his own. I think men would soon cease to be apathetic as to who represented them, when they found that their members were to be got at and conversed with.

But there is an advantage about electoral districts which outweighs this. You well know that when a man gets on the Council it is a matter of the utmost difficulty to get him off again. This point was touched on at your last meeting. Apart from any question of libel, it is a disagreeable thing to have to object to a man whom you never saw. At present, it can only be done in a way that creates a suspicion of personal bias and jealousy, which, as likely as not, will defeat the purpose in view. When a man can only be attacked by circular or letter to a trade journal it is a most invidious task to attempt. His conduct as a Councillor may be fairly open to discussion, only there is at present no fair means of discussing it. It is not necessary to suppose the candidate guilty of any low or mean or reprehensible conduct. He may simply not be a good representative, or he may neglect his duty. The result is the same in each case. No fair opportunity is given to call him to question, and anything like concerted action is impossible. Now I contend that if we had district representation this difficulty would disappear. A man who had not the confidence of his local fellow-tradesmen would have no other voters to return him. It would soon lead to all Councillors following the good example of our excellent representative, Mr. Young, in giving a more or less formal account of their stewardship. I need not dilate on the consequences of contact like this between voters and representatives. It would not usher in a golden age of pharmacy, but I firmly believe it would do much to make us more at one in our common interests.

It would certainly give us a just and easy way of getting rid of undesirable men; for, knowing them and being able to meet them at trade gatherings, we should be able to do our work of question or criticism without on the one hand, being exposed to the dangers of public letter-writing, or on the other hand exposing the Councillor or candidate to public contempt.

Again, I think district representation would give us all the advantages of the projected Federation of Pharmaceutical Associations without the disadvantage of duplicate organisations. I sympathise much with the objects of those who promoted the Federation. But I think it a waste of energy, and little likely to succeed. The Federation will probably never become sufficiently definite and compact to do any work. Even if it did, for want of a body within reach on which to place its blows it will effect little. If it could get at Councillors or candidates it might do something, but it cannot. The size, and if I may use the term, the amorphous properties of the constituency absorb its efforts and nullify them.

Another of our wants is, some alteration regarding the sale of poisons.

The schedule wants extending and re-arranging. I am not going into the carbolic acid question. That is a public want even more than a pharmaceutical one. The point I shall briefly note is this—that at present

the principal restrictions on the sale of poisons are rightly placed on the retailer. To those restrictions no reasonable pharmacist will object. But this question has arisen in my mind, are there sufficient restrictions on the wholesale sale of poisons? At present there are none except the labelling with the name of firm, name of article, and word "poison." I do not think these are sufficient. Plainly, I think it should be illegal to supply poisons wholesale to persons not on the medical or pharmaceutical registers. Exceptions would of course, be made in the case of hospitals and manufactories, large or small. What we want is to stop the supply to herbalists and unqualified traders, who can only want them for illegal sales. There are many wholesale houses who will not open accounts with any unregistered men. There are many who not only open accounts with them, but actually canvas them for orders. These houses are assisting them to break the law whenever poisons are supplied.

I am well aware a clause like this would give rise to much dispute, and would be difficult to enforce. It could be enforced, however. I think, too, that those houses who are loyal to the retail drug trade would welcome it, for it would help them against the competition of men of easier principles. You know what Government can do with a clause like this in the case of methylated spirit. It could do as much with our help, with a poisons clause drawn up on like lines. Of course, the analogy of methylated spirit holds good only up to a certain point, and there I must leave it for the present.

The next is perhaps our biggest want. It is the abolition of company pharmacy.

I am sure I do not need before this audience to discuss the fairness or justice of company pharmacy. I shall term it unjust to the individual pharmacist. It is from the point of view of its injustice that I shall deal with it, for it is that aspect of it that appeals most strongly to me. I care little how fierce the competition I have to face from a private firm of pharmacists or a brother trader qualified like myself. If in the struggle I go down, I can at least go down knowing that no unfairness has directed the blows that slay me. No sense of injustice will embitter my pharmaceutical end. But it is otherwise with the competition of a limited company. In that case I am fighting dividend-hunters, or what is really an unqualified trader who has taken into partnership "his sisters, his cousins, and his aunts." It is the sense of the injustice of this kind of trading that galls me.

Now, can this want be met? If so, how? It will be difficult to destroy company pharmacy, that goes without saying. It is in possession. It represents in some cases large vested interests. It appeals to the public pocket, an appeal always listened to attentively. So that there is a hard task to be got through before we get what we want here. Because the task is great, are we to sit down and say "it is done and we cannot undo it?" That may be your opinion, it is not mine.

The very first thing we have to do is to create all through the retail drug trade the feeling that com-

pany pharmacy is to be fought. We must fight it and not give up the fight until we are thoroughly beaten in Parliament and have made sure that we are beaten. There should be no backsliding on this point. Some wholesale houses and large retail traders are disposed to hesitate. It ought to become the test question of a pharmacist's loyalty to his calling, whether he is or is not in favour of the abolition of Company pharmacy. If he be disposed to hesitate or inclined to do nothing because of the magnitude of the task, he is not one of our friends. In this, as in higher questions of human affairs, "he that is not for us is against us." Some of you will be disposed to think I am now fighting a shadow. I am not. There is more lukewarmness than you think in the higher ranks of pharmacy. Only last year Mr. Leo Atkinson boldly said at the annual meeting of the Society that he thought we ought to give up the agitation against company pharmacy. If you happen to know any wholesale dealers who have accounts with these firms ask them what they think about it. You will soon see the necessity of bringing the trade into line on this matter. All are concerned. In the story of Tarquin it was the tallest poppies he cut down first. In this case they will live the longest, but our Tarquin will cut them down if he be not cut off himself.

Mr. Carteighe only spoke at Edinburgh the soberest truth when he said that there was no hope of successfully dealing with the companies unless the trade was united. To get a united trade you will have to give some people an uncomfortable hour or two, and not leave them until they find "salvation."

When we have got all pharmacists who are in the business, wholesale or retail, into line on this question, we shall be better able to deal with those men who, by serving the companies, enable them to carry on business. I am not just now going to throw stones at these men. The companies they serve have a legal position, and so I cannot regard them as quite outside the pale of reason. Besides, they have at least one good excuse. I set aside all the talk about their better conditions of employment, etc., etc. In some cases it is true, in many it is untrue. These companies would not change assistants so often if their shops were quite the Edens they are represented to be. No, these men have a better reason—it is that they are only doing with their labour what other and higher placed pharmacists do with their goods—selling to the limited companies. It may be quite right for A.B. to sell his specialties or drugs to company pharmacists—and quite wrong for C.D. to sell his services to the same firm.

I, however, cannot see where the difference comes in. The casuistry which makes it right to do the one thing and wrong to do the other is beyond a plain Lancashire lad like myself. I can only say "such knowledge is too wonderful for me, I cannot attain unto it." I am willing to admit there may be a difference in degree of offence, but none in kind. But when we have all done our heart-searching, and got rid of all interested views of this thing—when we have got something like solidity of opinion in the trade, and are prepared to treat both classes of offenders as they may

deserve—any appeal we may make to these company servants will stand any infinitely better chance of a favourable response than at present.

Then we need to do another thing. We need to imitate the Parliamentarians of Cromwell's day by passing a self-denying ordinance. We need to get rid of the "Widows' Clause," and consent to a limitation of the number of pharmacies a single trader or firm may conduct. To go to Parliament with the maintenance of these two things inscribed on our banner is to invite defeat. Our strongest point is that, although simply traders as regards the bulk of our business, yet, as the State-licensed retailers of poisons, we have a personal qualification which gives us a professional side.

It is this personal licensing and personal qualification on which the Pharmacy Acts insist, and on which we base our claim. But the "Widows' Clause" cuts out our contention and leaves us practically speechless. The multiplicity of branches owned by one man is not perhaps so logically unsound, but it is dangerous to our plea. How can a man owning eight, ten, or twenty branches give that personal attention to his businesses which the Acts suppose he will give and the public have a right to expect. I will leave that, but about the Widows' Clause I have a little more to say. Is the clause one really valuable to pharmacists as a whole? I think not. Is it there for every man's use if need be. In the vast majority of cases it is unused. Is it not a fact that in most cases where a deceased chemist has left no son ready to succeed him, that the best thing the widow can do is to sell the business as well and as quickly as possible? Is it not generally done? If I am right in putting the questions that way I should like to ask if it is worth while trying to retain this clause at the expense of perpetuating company pharmacy? I think not.

It should be, and is, possible to devise a plan by which the estate of a chemist dying without a qualified son to succeed him, may be safeguarded from a disastrous forced sale, other than the plan of allowing his widow or executors carry on the business. This being done, cases of hardship would be reduced to a minimum.

Let us look now at the matter from another point. I have heard it said that the public, being interested in getting goods at lowest prices, will not listen to anything like creating a monopoly for pharmacists. Consequently, it is said, we need not hope for legislative redress of our grievances. We are not without answer to these objections.

In the first place, we ask for no monopoly except that of dealing in poisons, and this only because the State forced personal qualification on us. Theoretically we have that monopoly. Practically, owing to the wording of the Act of 1868, we have no exclusive right to sell poisons. We only ask that the public, through the State, should be consistent and treat us justly.

Then you must not forget that even if company pharmacy be made illegal we shall by no means be free from company competition. It would only destroy utterly the man who gets relatives to form a limited company, and then practically is in business

for himself. From the large Civil Service Stores, Household Stores, and firms like Lewis's, it would only take the right to sell and dispense poisons, and preparations containing poisons sold under the Stamp Act. It would not destroy, and, perhaps, ought not to destroy, these firms. They would be left free to compete with us in everything else we sell besides poisons, and they would effectually secure the public from the suggested ravages of the protected pharmacist. From their competition in all but pure pharmacy we have no right to legislative protection, and we shall never get it. To ask it is a childish crying for the moon, unworthy of men engaged in serious occupations.

I feel so strongly on this point, that I cannot understand why certain pharmacists are willing to bring in a Bill containing a clause restricting the sale and dispensing of B.P. preparations to registered men. If the public will not let us put down company pharmacy, they most certainly will never grant us the sole right to make, sell, and dispense B.P. preparations. I pointed this out when Mr. Carteighe was here a few years ago, and he has not yet answered the objection, so far as I know.

Again, the public can be shown that their interests will be sufficiently safe, even if there were none but personally qualified men in the drug trade. Competition in our own ranks is keen enough to protect the public against exorbitant prices. Many chemists have gone permanently into the cash trading system, and more will follow. These and the natural growth of competition will keep prices at what, from a public aspect, are reasonable and fair. Whether they will be reasonable and fair from our point of view is another story, as Rudyard Kipling would say. But for that grievance I see no redress, and care little to ask for one.

We want these views embodying in a Bill introduced by the Pharmaceutical Society. The President of the Society frequently asks for support and direction from the trade. I think that kind of appeal has been made enough. The Society has done too much waiting for orders to march. It is time they began officially to lead. They waited until they were directed by medical opinion to proceed with the strict enforcement of Clause 17. It will be more statesman-like and dignified if the Society as represented by its official heads were to initiate a forward movement in the shape of promoting a thorough Pharmacy Act Amendment Bill. Until some big imperial questions are settled, and the House of Commons has become once more a machine for transacting public business, the chances of the Bill will be very few indeed. But whilst we are settling the big public questions, the time can be usefully employed in defining our wants, in closing up our own ranks, and in educating those to whom we shall ultimately have to appeal. Then when our opportunity comes we shall be able to make the best of it.

Finally, we want a greater feeling of comradeship between pharmacists of all ranks. Our Society is really a trades union. We ought all to belong to it. We have common interests to promote, and common

foes to meet. We should do both unitedly. The man who has the same interests and objects in life as a few thousand other men ought to join himself to them. If he does not, he is not only a source of weakness to them, he is false to his own interests. He deliberately handicaps both them and himself in the race for trade and living. A good trades union looks after the rights of its members. What does that mean but that its members look after their own rights? So with us. We have in the Society a trades union. Let us make it one worth something to us. To do that we must not only belong to it and take an intelligent interest in its proceedings, we must regard all our fellow-pharmacists as men having like interests with ourselves, and work to promote unity of aim. To do this we shall need to get rid of the petty jealousy which mars too many of our efforts. We shall have to learn better how to compete in a friendly way with each other, and at the same time unite for trade purposes, offensive and defensive. We live and work, I think, too much alone. We want to come more together, and in the equality that comes of intercourse we shall lose much of our narrowness and angularity.

With Ruskin, I do not wonder at what men suffer, but I often wonder at what they lose. I do not wonder that we suffer from competition, from the rapacity of outside traders, from the heat and pressure of the time and age. Such is the lot of almost all men. But I do wonder that we lose the help, the solidity, the public respect, the sense of comradeship, above all the material success which are the rewards of unity of feeling and action.

In the course of it he interpolated the remark that he had not included photographers among the unqualified persons who should not be allowed to sell poisons, but the remarks he had made about photographers applied to them equally.

The President, opening the discussion, remarked that Mr. Taylor had suggested that more stringent regulations should be enforced for the wholesale sale of poisons. Mr. Taylor was of opinion that poisons of should only be sold in a wholesale way to registered persons. That he (the chairman) believed could never be done. The moment an attempt was made to put stringent restrictions on the wholesale sale of poisons the cry would be raised, "You are interfering with the arts!" Still, there was room for considerable improvement of the regulations, which might well be made more strict than they were. Mr. Taylor had made reference to dividend hunters, but these were not the only men they had to contend against. They had to compete with men who were selling the goods of chemists and druggists at nearly cost price in order to decoy the public into their establishments, in the hope of inducing the public to buy goods upon which there was a much larger profit. He (the President) quite agreed with Mr. Taylor on the subject of the "Widows' Clause." He was particularly convinced of the desirableness of widows disposing of the businesses as quickly as possible. In the present state of trade it was not possible for a woman to engage a qualified assistant and carry on the business successfully. That could not be done in nine cases out of ten, and he thought the "Widows' Clause" would not be such a great sacrifice as was supposed, if the trade could make up its mind to

part with it. In reference to some recent prosecutions, Mr. Taylor must not forget that those prosecutions were very unwelcome to a very large section of chemists and druggists in the country. Concluding, the President moved a vote of thanks to Mr. Taylor for his valuable and interesting paper.

The motion was seconded by Mr. Kirkby, and carried with acclamation.

Dr. Paul, who was received with applause, first referred to the glaring inequalities of which Mr. Taylor had spoken, among those who were connected with the Society. He reminded the meeting that in 1868, when there was to a certain extent a general federation of the whole trade under the Act, then passed, the Society consisted entirely of pharmaceutical chemists. The general federation of the trade, and the registering of chemists and druggists, were steps taken, not on the principle upon which the Pharmaceutical Society had been established, but simply and solely as a State matter for the protection of the public. The Act was not passed for the protection of chemists' trade, interests directly, in any way whatever, although it was proposed at the time that chemists and druggists, who then became recognised as registered persons should be admitted to the Society—the idea was that they were only a vanishing quantity and that in the course of time chemists and druggists would cease to exist altogether, and every man in the trade would be a pharmaceutical chemist. It was under those conditions that the number of chemist and druggist members of the Council was confined to one-third. However, the idea of the founders of the Pharmaceutical Society had not been carried into effect. The men who had qualified since 1868 on the Minor basis were very numerous. They numbered something like 1,500, against upwards of 2,000 pharmaceutical chemists. Under those altered conditions it was very reasonable that there should be an alteration in the constitution of the Society, and that view had been accepted and recognised by the Council of the Society for years past. It had been included in the several Bills which had been introduced into Parliament. Parliamentary interference was necessary in this matter. All those Bills had failed to pass, and it rested with the chemists and druggists to endeavour to secure their passage.

The Council of the Society was perfectly willing to adopt the change. The "Widows' Clause" Mr. Taylor had spoken of as an insuperable obstacle to dealing with company trading. He (Dr. Paul) did not think that was the case. There were very few cases in which it was not desirable that widows should get rid of the businesses that had fallen to them as soon as possible. Of that he was confident. The "Widows' Clause," however, did not require to be wiped out altogether. All that was necessary was that it should be restricted in such a way that it would not be liable to abuse. As things stood now a man might establish a trust after his death, and in that way defeat the objects of the Act and have his business carried on by his executors indefinitely. The matter of the wholesale sale of poisons (Dr. Paul continued) was fully provided for in the Act. The Act said that wholesale trade in poisons should be exempt from the provisions of the Act so far as ordinary wholesale trading was concerned, and the seventeenth section made that position still more clear by stating the ordinary course of wholesale dealing to retail dealers. Registered men alone were able to retail poisons, and the Act contained a provision that the wholesale supply of poisons could only be secured by qualified retailers. That provision, however, had never been acted upon. One point which was especially deserving of the attention of chemists and druggists at the present time was the want of more

regard for the educational basis of their qualification, as it was by only safeguarding and improving their personal qualification that chemists might hope to effect any good for themselves.

The work of trade protection would never be done by the Council of the Pharmaceutical Society. It was a work which must be done by the chemists themselves, by active association. It was pitiable to see company trading supported by qualified men, especially as they knew that company trading could not exist for a day if it were not for the support of qualified men. Chemists had in their own hands the means of putting a stop altogether to company trading so far as there was any legal protection accorded by the Act. In his opinion legislative protection was required with regard to the general exercise of pharmacy, dispensing, and the preparation of medicines, quite as much as for the sale of poisons. The conditions of competent qualification in his opinion were far too little to ensure the protection of trade interests. The interests of the trade were very materially damaged by "parasites" who had failed to pass their examinations. The engagement of apprentices who had not passed the Preliminary examination was another custom which was materially detrimental to qualified men.

The future prospects of the trade depended much more largely upon organisation among the members of the trade than by efforts to secure further legislation. There was no knowing how a Bill would be mauled in Parliament, no matter how well drawn and how reasonable it might be.

Mr. Pendlebury complained that among the examining body were men who did not know properly the subjects in which they examined.

Mr. J. R. Young, of Warrington, pointed out that, though chemists and druggists were entitled to one-third of the seats on the Council, they had never seen fit to increase their representation beyond three. He argued that if the Council sought to abolish the "Widows' Clause" 50 per cent. of the trade would be against them.

Mr. H. Kempagreed with Mr. Taylor that there ought to be an Act preventing wholesale dealers in poison from selling to herbalists. There would not be half the illegitimate trading that there was if the wholesale dealer reserved his trade for legitimate retail traders. He agreed with Dr. Paul that the "Widows' Clause" should be restricted, and not abolished, and contended that the best interests of the trade would be served by making the examinations of the students stiffer.

Mr. Taylor having briefly replied, the discussion ended.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

A meeting of the Sheffield Pharmaceutical Society was held in the Society's Rooms, on Wednesday night, to discuss some aspects of pharmaceutical politics. Mr. J. F. Eardley presided, and there was a fair attendance of members and associates.

The Chairman introduced the subject of the debate by reading some long extracts from a recent speech by Mr. Carteighe at a meeting of the Glasgow and West of Scotland Pharmaceutical Association, in which that gentleman gave a sketch of the history of pharmacy legislation, with special reference to the operation of the "Widows' Clause," and the tendency of it to foster company trading. Mr. Carteighe declared that the pharmacy law was defective in many ways, and that it would be useless to attempt any reform without the full support of the trade. The Chairman added some strong expressions of approval of Mr. Carteighe's views, and that the great trouble seemed to be the "Widows' Clause."

Mr. W. Ward said he wished that the subject for discussion had been pharmaceutical econo-

mios, because his experience had led him to conclude that a discussion of pharmaceutical politics was of very little use. They were bound to admit the fact that one of the underlying mischiefs of the present conditions had been simply appalling. He could come to no other conclusion than that one great reason for the position into which the trade of the pharmacist seemed to be falling was the lack of interest and unanimity among the chemists and druggists of the United Kingdom. Experience had taught them also that they could not look to the State for help. The State had done as much as was possible in the general condition of free trade principles, and it seemed to him that pharmacists would have to fall back on their own resources, and exercise their own judgment in determining how they might make the best of the unfortunate circumstances in which they were placed. Mr. Cartelge had said a good deal about the effect of the "Widows' Clause," but what was now being said was simply what he himself foretold several years ago when he delivered a speech at Leeds on pharmaceutical politics. He then expressed his regret that such a clause should be introduced into the Pharmacy Bill, but no one took his view of the matter. Events had proved, however, that the inclusion was unfortunate, and it was plain to them all that it would be a difficult thing to get the clause expunged. He believed it would have been to the advantage of the widows themselves if the clause had never been inserted, and he would now strongly go in for the expunging of it. In some further observations he dwelt upon the absolute necessity for greater unity in the profession.

Mr. H. E. Ibbitt said for his part he thought it was useless to try to eliminate the "Widows' Clause" or to stop company trading, for the judges had laid it down that it did not matter who found the capital as long as a proper man was employed to conduct the business. Though the abolition of the "Widows' Clause" if it could be secured would not do away with company trading, still there was a good deal that the Pharmaceutical Society could do. They might look to the Colonial laws for guidance in many things, especially in the direction of securing the registration of the managers of pharmacy establishments, and of securing that the name of the actual vendor should be placed on labels accompanying poisons.

Mr. C. O. Morrison agreed with what had been said about the difficulty of amending the pharmacy law in the direction indicated, and said that, as practical business men, they must ask themselves whether such an amendment as the expunging of the "Widows' Clause" would result in the public being better protected. If they went to the House of Commons with a Bill, this would be the first question they would be asked, and on their answer everything would depend. He said it was a shame and a disgrace that a company could assume a title by simple combination which an individual could only take by examination. He believed, however, that the professional part of the business was now as much in the hands of pharmacists as ever it was. To maintain this, they must commence with the apprentices. It was high time that the Preliminary examination was stiffened, and he thought, too, that they should have a curriculum. The opposition to those things did not come from outsiders, but was internal opposition, and they ought to be ashamed of themselves for it. Another thing was the lack of union, which was most deplorable.

Mr. Greaves and Mr. Davy endorsed the observations of Mr. Morrison, and subsequently Mr. G. Squire, honorary secretary, Mr. Haining, and others spoke.

The Chairman summed up the discussion, but no resolution was put.

Afterwards the subject of establishing a price list was discussed.

SUNDERLAND CHEMISTS' ASSOCIATION.

The annual dinner of the Association was held at the Grand Hotel on Wednesday, the 12th inst. The President, Councillor Harrison, J.P., presided, and there were also present the following officers of the Association:—Mr. R. H. Bell, Secretary, Mr. Leadbitter, Treasurer, Messrs. White, Ranken, Walton, Asken, and Todd, members of the Council, and a large number of members and friends. After the loyal toasts had been duly honoured, Mr. C. Bell proposed "The Pharmaceutical Society," which was suitably responded to by Mr. C. Ranken, the Local Secretary of the Society.

The President, in responding to the toast of his health, congratulated the members on the renewed vitality now shown by the Association, and expressed his earnest desire to see its sphere of usefulness largely increased by the extension of opportunities for the consideration and discussion of matters connected with the craft. He referred also to the work of the Pharmaceutical Society, and pointed out how its influence for good could be greatly increased if only the majority of those engaged in the practice of pharmacy would join its ranks. Other toasts followed, and an enjoyable evening was spent.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

ACTION AGAINST AN UNREGISTERED PERSON.

At the Bow County Court on Friday, December 7, before his Honour Judge French, Q.C., the Pharmaceutical Society sued F. P. Ward, of 1, Tredegar Road, Bow, for two penalties of £5 each, one for keeping open shop for the retailing of poisons, and the other for assuming or exhibiting the title of Chemist contrary to the Pharmacy Act of 1868.

Mr. T. R. Grey (instructed by Messrs. Flux, Thompson, and Flux) appeared as counsel for the Pharmaceutical Society. The defendant appeared in person.

The defendant at once admitted his liability, and his Honour gave judgment for the plaintiffs, with costs.

SALE OF POISONS BY AN UNREGISTERED PERSON.

At the Mansfield County Court, on Monday, before Judge Masterman, D.C.L., Edwin Buckland, shopkeeper, was sued at the instance of the Pharmaceutical Society, who sought to recover a penalty of £5 for an infringement of the Pharmacy Act of 1868.

Mr. T. R. Grey (London), instructed by the solicitors to the Society, appeared in support of the summons, and Mr. E. H. Fraser (Nottingham), defended.

Mr. Grey, in opening the case, said that the defendant carried on business at Sutton-in-Ashfield, near Mansfield, under style of "Buckland's Drug Stores," and the prosecution was instituted under 31 and 32 Vic., cap. 121, which was an Act to regulate the sale of poisons. On October 17 last, a witness, who would be called before the court, went into the defendant's shop and asked for some soap liniment and laudanum. The defendant replied that he was out of one of the ingredients, and he sent a boy for it. The boy returned and handed the bottle to the defendant, who mixed the ingredients together. On the same day the witness asked for another compound, containing oil of peppermint, paregoric, oil of aniseed and laudanum. The defendant, observing that he was just out of laudanum, again sent the boy out, and when he returned the defendant mixed it with ingredients from other bottles in the shop. Both bottles were afterwards handed over by the witness, and on their con-

tents being analysed they were found to contain laudanum. He (Mr. Grey) did not know what the defence would be, but it was no defence to say that he sent out for the poison and got it from a chemist, as the person who sold the substance was liable. The defendant not only sold the poison, but his shop was kept open for compounding it within the meaning of the Act.

Arthur Foulds, an inquiry agent, of Salford, stated that he was instructed by the Pharmaceutical Society to make certain purchases at 14, King Street, Sutton-in-Ashfield, and on going there on October 17, he found a small sign, upon which were the words "Buckland's Drug Stores." Witness asked to be supplied with two pennyworth of laudanum and two pennyworth of soapliniment mixed. Defendant said that he was out of one of them, but he did not say which, and then sent his boy for it. Witness afterwards asked for a cough mixture, consisting of one pennyworth each of oil of peppermint, oil of aniseed, paregoric and laudanum, and the defendant said, "I am just out of some of them, but if you will wait, I will send for them." Witness afterwards received the mixture, and, sealing both bottles up, handed them to Mr. Stroud, managing clerk to the plaintiff's solicitors.

Cross-examined by Mr. Fraser, witness said that he was not aware that there were two persons of the name of Buckland carrying on business. He was not informed that the defendant did not sell laudanum. He never saw any ingredient put into the first bottle before it was taken from the shop, nor did he see that the label on the bottle was that of G. W. Briggs, Sutton-in-Ashfield. When defendant's boy returned with the second bottle there was a small quantity of liquid at the bottom. The boy handed it to defendant, who poured in other liquids from large bottles in the shop. Mr. T. W. Stroud then deposed to having received the bottles from the last witness, and that they were both sealed.

Mr. E. J. Eastes, analyst, said that he received the bottles from Mr. Stroud on November 3, and analysed their contents, finding that the first preparation contained opium. The amount of morphine present was 2.2 grains. The second purchase also contained opium, but to a smaller extent.

For the defence, Mr. Fraser contended that there was no evidence to prove that the contents of the bottles could not have been changed in the meantime. The informer had simply taken them away, and two sealed bottles were afterwards delivered to some body. The defendant commenced business in the month of August, when he opened the shop for the sale of any drugs except poisons. He had never dispensed a single prescription, or sold a single poison. When a person came in for an ordinary drug he sold it, but if a poisonous drug was wanted he sent out for it to Mr. Briggs, a qualified chemist. The defendant always required the money for it before it was sent for. The whole of the cough mixture was compounded in the shop of Mr. Briggs, and all the profit was taken by him. As far as he could judge, there seemed to be a complete absence of the caution which was generally exercised in such cases. When any article was purchased for the purpose of analysis, it was necessary that the salesman should be informed of it.

Edwin Buckland, the defendant was then called, and said that he never had any laudanum except when he allowed the boy to go for it. The compounds in the bottles produced were not compounded in his shop, but by Mr. G. W. Briggs. With regard to the second bottle, that bore the label of Mr. Briggs, and witness got no profit on it. Cross-examined, defendant admitted that he might have said to Foulds that he was out of one of the drugs. He was prepared to swear that Foulds gave the boy the money for the first purchase. Witness never

touched the bottle when the boy brought it back, Foulds taking it off the counter.

The defendant's boy having corroborated this statement, George William Briggs, pharmaceutical chemist, Sutton-in-Ashfield, stated that he occasionally supplied goods to Mr. Buckland, but rarely in poisons. Witness, however, supplied the compound in question, and placed a label on it.

Cross-examined: On the second bottle witness put his own label and also a poison label, but these must have been removed.

His Honour, in giving judgment, said that he was satisfied that the prosecution had not thoroughly made out their case, and he would therefore give the defendant the benefit of the doubt. As to the question of costs, he thought the Pharmaceutical Society were quite justified in bringing the case forward, and he therefore could not allow the defendant's costs.

Answers to Correspondents, etc.

R. H.—The addition can be made, but it will be necessary to send the instrument to an optician for the purpose. Baker, of 243, High Holborn, London, could effect the alteration for you.

Correction.—On page 484, column 1, line 21, for "*kleimostat*" read "*klinostat*."

Diary of the Week.

MONDAY, DECEMBER 17.

Imperial Institute.

House Dinner, at 6.45 p.m.

"The Papuan at Home; or a Visit to British New Guinea," by Belyse Baildon, at 8.30 p.m.

Society of Arts, at 8 p.m.

"Modern Developments in Explosives" (Lecture IV.), by Professor Vivian B. Lewes.

TUESDAY, DECEMBER 18.

Central London Throat and Ear Hospital, at 4.30 p.m.

"Doubts in Diagnosis as Determined by Clinical Observation," by Lennox Browne.

WEDNESDAY, DECEMBER 19.

Imperial Institute.

Concert Dinner, at 6.30 p.m.

Ladies' Concert, at 8.30 p.m.

Society of Arts, at 8 p.m.

"Forestry," by Lieut.-Gen. J. Michael.

Royal Microscopical Society, at 8 p.m.

Ordinary Meeting of the Society.

Western Chemists' Association (of London) at 9 p.m.

Introductory Address by the President, at 1, Craven Road, W.

THURSDAY, DECEMBER 20.

Imperial Institute, at 4.30 p.m.

"The Coalfields and Mineral Resources of New South Wales," by J. Inglis.

Linnean Society of London, at 8 p.m.

"On the Spinning-glands in *Phrynus*," by H. M. Bernard.

"On Monocotyledonous *Saprophytes*," by Percy Groom.

Chemical Society, at 8 p.m.

"An Improved form of Barometer," by Dr. N. Collie.

"The Chemical Constituents of *Piper Ovatum*," by Professor Dunstan, and H. Garnett.

"Note on the Active Constituent by the *Pelletory of Medicine*," by Professor Dunstan, and H. Garnett.

"The Preparation of Adipic Acid," by Dr. W. H. Ince.

FRIDAY, DECEMBER 21.

Quekett Microscopical Club, at 8 p.m.

Ordinary Meeting.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Addison, Bannerman, Bell, Blackburn, Blake, Brown, Browne, Clarke, Cocks, Cross, Crowhurst, Dewar, Dunlop, Harrison, Henry, Hill, Jones, Keen, Kerahaw, Laird, Martin, Martindale, Moffatt, Phillips, Powell, Pringle, Taylor, Thirby, Tocher, Turver, West, Young.

THE DISCOVERY OF OXYGEN.

(Continued from page 438.)

JOSEPH PRIESTLEY.

Joseph Priestley was born on March 13, 1733, at Fieldhead, near Birstal, in Yorkshire. He was the son of a woollen-cloth dresser, possessing only moderate means, and was educated as a Nonconformist minister. After taking charge of congregations at Needham Market, in Suffolk, and, later, at Nantwich, he was appointed classical tutor in a Nonconformist academy at Warrington. Subsequently he took charge of Mill Hill Chapel, Leeds, and adopted Unitarian ideas, and, finally, he removed to Birmingham, where his chapel and house were burnt down in 1791 by a mob which associated him in error with a dinner held to commemorate the capture of the Bastille by the French revolutionists. All his manuscripts, apparatus, and other valued material possessions were destroyed, and the labours of years wasted. Leaving Bir-

Electricity'; in 1774 his 'Experiments and Observations on Different Kinds of Air, etc.' began to appear; and in 1800 he published a treatise entitled 'The Doctrine of Phlogiston Established, and that of the Composition of Water Refuted.'

According to Roscoe and Schorlemmer, no one obtained more important results or threw more light upon the chemical existence of a number of different gases than Joseph Priestley. In 1772, he proved that the burning of combustible bodies and the respiration of animals both deteriorate air and diminish its volume. Attributing these effects to the addition of phlogiston to the air, he gave the name "phlogisticated air" to the gas (nitrogen) left after treatment of the impure air with milk of lime, which removed the carbon dioxide (fixed air). The air deteriorated by combustion or respiration he afterwards found could be rendered again capable of supporting combustion by the action of living plants, which he assumed to be capable of removing the phlogiston.

On August 1, 1774, he first obtained oxygen gas (dephlogisticated air) from red precipitate, and his was the first printed account of its discovery. He was also the first to prepare nitric oxide (nitrous air), nitrous oxide (dephlogisticated nitrous air), and carbon monoxide; and to collect over mercury ammonia gas (alkaline air), hydrochloric acid gas (marine acid air), sulphurous acid gas (vitriolic acid air), and silicon tetrafluoride (fluor acid air). He devised the "pneumatic trough," as we now know it, in the course of his experiments. In addition, he observed that an increase of volume occurred and a combustible gas was formed on passing electric sparks through ammonia gas; that nitrogen gas (phlogisticated air) was evolved on heating ammonia with calx of lead; and that water aerated with carbon dioxide could hardly be distinguished from seltzer water. In commenting upon the fact that "the pressure of the atmosphere assists very considerably in keeping fixed air confined in water," he virtually suggested the idea of the manufacture of so-called "soda-water."

PRIESTLEY'S WORK ON OXYGEN.

In the third section of his "Experiments and Observations on Different Kinds of Air," Priestley remarks that there were few maxims in philosophy that, at the time he commenced his investigations on the subject, had laid firmer hold upon the mind than that atmospheric air freed from impurities was a simple elementary substance, indestructible and unalterable. He proceeds to say that he was soon convinced of the error of this opinion, "for that the phlogiston with which it (the air) becomes loaded from bodies burning in it, and animals breathing it, and various other chemical processes, so far alters and depraves it as to render it altogether unfit for inflammation (combustion), respiration, and other purposes to which it is subservient; and I had discovered that agitation in water, the process of vegetation, and probably other natural processes, by taking out the superfluous phlogiston, restore it to its original purity."

He had previously been led to conclude that common air consisted of marine (hydrochloric)

¹ The portion of this work bearing on the discovery of oxygen is reprinted in a convenient form by the Alembic Club (Edinburgh: W. F. Clay).



JOSEPH PRIESTLEY.

mingham, he spent three years in Hackney, and in 1794 proceeded to Northumberland, Pennsylvania, where he died on February 6, 1804.

Whilst a student, Priestley acquired three modern languages, in addition to Latin, Greek, Hebrew, Chaldean, Syriac, and some Arabic. Mathematics, natural philosophy, logic, and metaphysics, also occupied much of his attention, and after settling at Nantwich he devoted much time to the study of chemistry and electricity. He received the complimentary degree of LL.D. from Edinburgh whilst at Warrington, and in 1766 his work in electricity procured him election to the Royal Society. The following year he published his 'History of

acid and phlogiston, his method of reasoning being as follows:—The union of marine acid vapour and phlogiston, by the action of the acid on certain metals or inflammable substances, produces inflammable air (hydrogen); and "inflammable air, by agitation in water, ceases to be inflammable, and becomes respirable, like ordinary air."² Though he could never make the residue quite so good as common air, he thought it very probable that vegetation, in more favourable circumstances than any in which he could apply it,

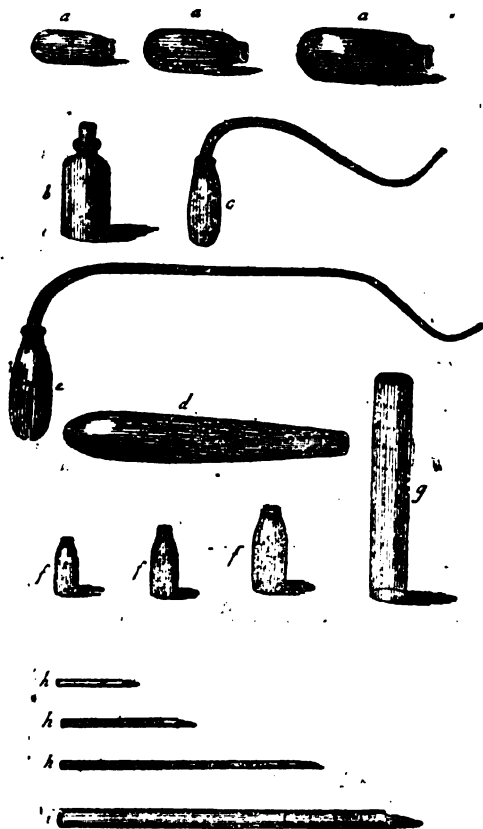


Fig. 1.—Apparatus used by Priestley in his experiments on air—*a*, *d*, glass phials for generation of gases by heat; *c*, *e*, the same fitted with stoppers prolonged into delivery tubes; *b*, phial with many small holes in stopper, used for conveying liquids, etc., into jars inverted in vessels of water; *f*, vessels for measuring gases; *g*, larger, graduated measure; *h*, flint-glass tubes for measuring gases; *i*, larger, graduated flint-glass tube.

or some other natural process, might render it more pure. Upon this supposition he based the conjecture that the earth's atmosphere was originally derived from volcanoes which had emitted inflammable air, and that this air, by agitation with water, became deprived of its inflammability, and subse-

quently became sufficiently purified by vegetation to be fit for respiration. On this hypothesis it was apparently assumed that plants previously flourished in the absence of an atmosphere, or that they were developed simultaneously with, but yet independently of, it.

EXPERIMENTS AND RESULTS.

The results of a series of observations now undertaken by Priestley, however, compelled him to give up this hypothesis, and led him unexpectedly to the solution of the great problem which he had "had in view ever since his discovery that the atmospherical air is alterable, and therefore that it is not an elementary substance, but a composition," the problem being "what this composition is, or what is the thing that we breathe!" In his experiments he placed various substances in vessels (*a*, fig. 1), which were then filled with quicksilver and inverted in a basin containing the same metal.³ Ignition of the enclosed substance was then performed or attempted by means of a large burning-glass or mirror, this operation being performed in much the same manner as represented in fig. 2. Any gas or vapour given off, displaced part of the mercury in the vessel *a*. Under this treatment *mercurius calcinatus per se* (mercuric oxide prepared by heating mercury in the presence of air) yielded "a kind of air" very readily. A candle burned in this air with a remarkably vigorous flame, "very much like that enlarged flame with which a candle burns in nitrous air (nitric oxide) exposed to iron or liver of sulphur."⁴ But as Priestley had got nothing like this remarkable appearance from any other kind of air besides this particular modification of nitrous air, and knew no nitric acid was used in the preparation of *mercurius calcinatus*, he was utterly at a loss how to account for the phenomenon. In this case, also, though he did not give sufficient attention to the circumstance at the time, the flame of the candle, besides being larger, burned with greater brilliancy and heat in the new kind of air than in the modified nitrous air, whilst "A piece of red-hot wood sparkled in it, exactly like paper dipped in a solution of nitre, and it consumed very fast."

³ "The most accurate method of procuring air from several substances by means of heat is to put them, if they will bear it, into phials, such as *a*, *a*, *a*, full of quicksilver, with their mouths immersed in the same, and then throwing the focus of a burning-mirror upon them."—(Priestley).

⁴ "Nitrous gas (nitric oxide) being exposed to a large surface of iron during two months, was rendered capable of maintaining flame, and even enlarging the flame, although it continued highly noxious. The same effects were produced by exposing nitrous gas to liver of sulphur during twenty-four hours; and to a mixture of iron filings and sulphur." (Appendix to Macquer's 'Dictionary of Chemistry.') The explanation of the above is that, by reduction of the nitric oxide, which is normally a non-supporter of combustion, nitrous oxide (dephlogisticated nitrous air) was formed. The latter gas, as is well known, closely resembles oxygen in many of its properties, and especially as a supporter of combustion. Priestley's test as to whether a gas was respirable or noxious was based on the fact, first observed by himself, that ruddy fumes of nitric peroxide are formed when nitric oxide is mixed with air, which, naturally, constituted his standard of respirability and purity amongst gases. This phenomenon also occurs, and more markedly, in the case of pure oxygen, but in the instance quoted by Macquer the admission of fresh nitric oxide would, of course, be followed by no such effect, and the absence of red fumes was mistakenly assumed to indicate unfitness of the nitrous oxide to be respired.

² The process here referred to consisted in long-continued agitation with water in a glass jar inverted in a large trough of water. The agitation was continued until no more gas could be absorbed, and the surface of the water in the trough being exposed to the air, the probability is that most of the hydrogen escaped during the operation.

The fact that red precipitate prepared from a solution of mercury in spirit of nitre (nitric acid) yielded a similar air to the *mercurius calcinatus* led Priestley, bearing in mind his previous experiments with nitric oxide, to think that this evolution of gas depended upon something proceeding from the nitric acid. Further, he considered that since the *mercurius calcinatus* is formed by the action of heat in the presence of air, it had, whilst in a heated condition, absorbed some essential constituent of nitre from the atmosphere. In arriving at this conclusion, Priestley unconsciously fell back upon the suggestion published by Mayow long previously. This, however, appearing to him much more extraordinary than it ought to have done, he entertained some suspicion that the *mercurius calcinatus*, on which he had made his experiments, "being bought at a common apothecary's, might, in fact, be nothing more than red precipitate; though, had I been anything of a practical chymist, I could not have entertained any such suspicion." Ultimately, this thoroughly justifiable suspicion was dissipated and expelled from the experimenter's mind after the examination of a specimen supplied by a friend who warranted it genuine. This being treated in

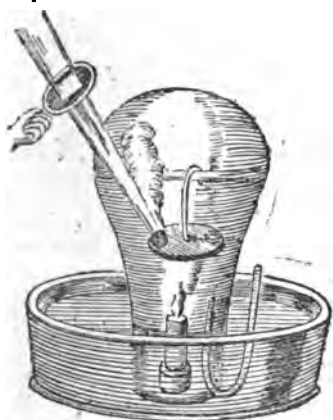


Fig. 2.—Apparatus used by Mayow in his experiments in pneumatic chemistry. Combustion of the enclosed substance is being effected by means of a burning-glass. The bent tube served to introduce air or various gases into the vessel, and the lighted candle as a test of the power of supporting combustion possessed by the gas evolved from the ignited substance.

the same manner as the former, only by a longer continuance of heat, yielded much more gas than the other. Subsequently, the same gas was obtained from red lead, or minium, and this experiment confirmed the suspicion that the *mercurius calcinatus* must get the property of yielding the new kind of air from the atmosphere, the process by which the two compounds were made being similar.

As yet, Priestley—taking it for granted that what he was examining was identical with nitrous oxide—had no idea that the new gas was wholesome. But a larger supply of it was now prepared and examined as to its properties. Its extraordinary power of supporting combustion convinced him that there was a very material difference between it and the modified or phlogisticated nitrous air. Whilst the latter, after a few moments agitation in

water was deprived of its power of supporting combustion,⁵ ten times as much agitation failed to produce any sensible change in the new gas. The latter also mixed with common air without the mixture decreasing in bulk as was the case when nitric oxide was added. Again, when one measure of nitric oxide was mixed with two of the new gas, it was found that the total volume of gas diminished, and the mixture assumed a red colour, just as had been observed was the case with a similar mixture of nitric oxide and common air. Priestley concluded, accordingly, that the air from *mercurius calcinatus* was fit for respiration and had all the other properties of common air, but yet remained of opinion that the explanation of the matter was that the compound had extracted spirit of nitre (nitric acid) from the atmosphere.

CONFIRMATORY EXPERIMENTS.

Fortunately, a lighted candle was by chance introduced into the mixture of the new gas with nitric oxide and found to burn steadily, whereas it had been previously observed that in a similar mixture made with common air the flame was extinguished. Further, a mouse remained lively for twice as long in a vessel filled with the new air as it would in common air, and, though apparently dead when removed, subsequently revived, whilst the vitiated atmosphere of the vessel in which the experiment had been performed proved to be purer than common air, combining with a much larger proportion of nitric oxide than the latter would, and even then supporting respiration in the case of another mouse.⁶ Eventually, then, the belief was forced upon Priestley that the new air must be better than the ordinary kind. "Being now fully satisfied with respect to the nature of this new species of air, viz., that, being capable of taking more phlogiston from nitrous air, it therefore originally contains less of this principle, my next inquiry was, by what means it comes to be so pure, or, philosophically speaking, to be so much dephlogisticated; and since the red lead yields the same kind of air with *mercurius calcinatus*, though mixed with fixed air⁷ (carbon dioxide), and is a much cheaper material, I proceeded to examine all the preparations of lead, made by heat in the open air, to see what kind of

⁵ Nitrous oxide is soluble in three-fourths its volume of water. In this experiment, therefore, it would be practically all removed in the process of washing. Oxygen, on the other hand, is but slightly soluble in water.

⁶ It was discovered also that the new air exploded much more violently with inflammable air (hydrogen) than did common air, the best result being attained when the hydrogen constituted two-thirds of the mixture. Priestley estimated that his factitious air, the density of which, as compared with ordinary air, he gave as 187 to 165, was capable of producing five or six times the effect of the latter, the contamination of which he attributed to the phlogiston contained in the vapours mixed with it.

⁷ Probably due to the presence of lead carbonate in the *grey calx*, from which *minium* was formerly prepared by the application of gentle heat. As an intermediate stage *massicot*, or yellow lead, was formed. The physical changes involved in the chemical decomposition of metallic oxides and other compounds under the influence of heat, etc., were not now observed for the first time, but had in most cases been familiar to experimenters from remote antiquity. The only novelty consisted in the recognition of the fact that previously unknown gaseous bodies were evolved, which possessed distinct properties. Bayen had previously noted that a gas was given off from red oxide of mercury when heated, but did not investigate the matter further, though he subsequently claimed the discovery of oxygen when the facts had been established by Priestley.

air they would yield, beginning with the *grey calx* (impure lead oxide), and ending with *litharge*."

As a result of these experiments, the "dephlogisticated" air (oxygen) was obtained from massicot, lead ore, grey calx of lead, and litharge. The next step was to moisten red lead with vitriolic (sulphuric), marine (hydrochloric), and nitrous (nitric) acids, respectively, and dry and powder the resulting mixtures, which were then heated separately in a gun-barrel. The portions that had been treated with the first two acids became white and gave off no gas on heating, as was to be expected seeing that all the oxygen would have been previously driven off in the process of drying. The third portion, which would contain lead nitrate and, probably, undecomposed carbonate, became deep brown, and yielded a mixture of fixed air and dephlogisticated air (carbon dioxide and oxygen). The red lead and other substances, which had yielded all the oxygen that could be extracted from them by this process, were further found to yield as much as at first after being moistened with fresh nitric acid and treated as before. Priestley was now convinced, therefore, that, agreeable to his original conjecture, it was the nitric acid which the red lead, etc., had acquired from the air, which had enabled them to yield the dephlogisticated air. "Finding also . . . that the same kind of air is produced by moistening with the spirit of nitre any kind of earth that is free from phlogiston, and treating it as I had done the red lead in the last-mentioned experiment, there remained no doubt in my mind but that *atmospherical air*, or the thing we breathe, consists of the *nitrous acid and earth*,⁸ with so much phlogiston as is necessary to its elasticity; and likewise so much more as is required to bring it from its state of perfect purity to the mean condition in which we find it."

PRIESTLEY'S SUGGESTIONS AND CONCLUSIONS.

In the course of numerous experiments, Priestley subsequently obtained the dephlogisticated air from nitre, alum, and a large number of other substances, such as flowers of zinc, chalk, clay, gypsum, magnesia alba, wood ashes, flints, Muscovy talc, etc., etc., his usual method being to heat the substance alone, or after moistening with nitric acid and drying, in a gun-barrel, oraphial into the neck of which was fitted a bent glass tube (c, e, fig. 1). The gas was collected over water, and there was found to be a great variety in the purity of the dephlogisticated air procured from the same substances. "But this will not be wondered at, if it be considered that a small quantity of phlogistic matter, accidentally mixing with the ingredients for the composition of this air, depraves it." In making the experiment in a gun-barrel also, if "the produce of air be not very rapid, there will be time for the phlogiston to be disengaged from the iron itself, and to mix with the air." Sometimes, therefore, the gas given off was fairly pure, but occasionally it was "so charged with phlogiston as to be perfectly noxious," or, again, it consisted to a greater or less extent of

nitric oxide, whilst the red lead employed was perhaps reduced to the metallic state, and the residue difficult to remove from the gun-barrel. In discussing the latter difficulty the necessity of keeping the apparatus used in proper order is enlarged upon by the experimenter, who quaintly summarises the matter in the following terms:—"If, therefore, any person shall propose to make dephlogisticated air in large quantities, he should have an apparatus appropriated to that purpose; and the greatest care should be taken to keep the instruments as clear as possible from all phlogistic matter, which is the very bane of purity with respect to air, they being exactly *plus* and *minus* to each other."

Priestley suggested that his hypothesis, "that atmospheric air consists of the nitrous acid and earth," accorded well with the facts relating to the production of nitre, which he attributed to a decomposition of the air, and the combination of the resulting nitric acid by "such kinds of earth" as were supposed to have an affinity for it. He also accounted for the disappearance of the nitric acid, on the detonation of nitre, by assuming that it combined with some "earthy or inflammable matter, with which it forms some of the many species of air, into the composition of which this wonderful acid enters." Further, he inferred that the introduction of a quantity of very pure dephlogisticated air into a room "in which much company should be confined," would agreeably qualify the noxious air of the room, "so that from being offensive and unwholesome, it would almost instantly become sweet and wholesome. This air might be brought into the room in casks, or a laboratory might be constructed for generating the air, and throwing it into the room as fast as it should be produced."

Other ideas that suggested themselves to him were: to fill the interstices of gunpowder with dephlogisticated air rather than common air, so as to augment the force of its explosion; to increase the force of fires by blowing them with the pure air; and to aid the lungs in throwing off "the phlogistic putrid effluvia" in certain morbid cases. In this connection it is sagely remarked "that though pure dephlogisticated air might be very useful as a *medicine*, it might not be so proper for us in the usual healthy state of the body; for, as a candle burns out much faster in dephlogisticated than in common air, so we might, as may be said, *live out too fast*, and the animal powers be too soon exhausted in this pure kind of air."

Ultimately, Priestley concluded that common air is composed of one volume of "dephlogisticated air" to four volumes of "phlogisticated air." These proportions accord well with those in which oxygen and nitrogen are now known to exist in the atmosphere.* At the same time he did not recognise

⁸ One of the four *primitive* principles of the alchemists and their immediate successors, the early chemists: "We cannot doubt . . . that the greatest part of the compounds which we can analyse contain earth as one of their principles, for after art has exhausted all its efforts to decompose them, a fixed and solid matter always remains upon which no change can be produced, and this is what is generally called earth. It has the solidity, weight, fixity, and other principal properties of the mass of solid matter which forms the globe we inhabit, called also *the earth*."—(Macquer).

* It is a remarkable fact that the figures recorded by Priestley as the results of his quantitative experiments are, in many important instances, and despite the crudity of his appliances and methods, very closely approximate to those obtained by the most refined processes of modern chemical analysis. Thus, he found that when 1 oz. of metallic lead was regenerated from its oxide in an atmosphere of hydrogen, absorption of the gas to the extent of about 4.4 grains occurred, whilst 1 oz. of tin required 15.4 grains of hydrogen for its complete reduction to the metallic state. The figures now accepted are 4.6 grains, and 16.3 grains respectively.

n the latter constituent a distinct substance, but regarded it simply as a combination of pure air (oxygen) with phlogiston.

VALUE OF PRIESTLEY'S WORK.

It will be seen, then, that in spite of his want of system, and perhaps even on account of it, Priestley not only discovered oxygen but anticipated much of what we now know regarding it, though, as already mentioned, he failed to fully comprehend the bearing and importance of the phenomena he observed during the course of his investigations. He retained until the end of his life a firm belief in the truth of the phlogiston theory, thus affording an interesting example of the truth of his own statement that "We may take a maxim so strongly for granted, that the plainest evidence of sense will not entirely change, and often hardly modify, our persuasions; and the more ingenious a man is the more effectually he is entangled in his errors, his ingenuity only helping him to deceive himself by evading the force of truth."

Nevertheless, he was mainly though unconsciously instrumental in destroying this theory by his life-work, and particularly by his discovery of "dephlogisticated air," which was the chief of the remarkable results he attained in his prolonged work on gases. When confirmed later by the publication of Scheele's work, the matter was left in such a position that it only required the clear perception of a mind like that of Lavoisier, unbiassed by the eccentricities of the phlogiston theory, to appreciate the full significance of the facts observed, and arrive at the only logical conclusion by the application of the method of induction.

Priestley was far from systematic in his work, and believed that all discoveries are made by chance, this idea being doubtless fostered by the fact that so little was then accurately known in the department in which he elected to work, whilst so many of Nature's secrets lay as it were close to the surface, ready to disclose themselves at the touch of the most inexperienced hand. The easily-won riches of the mine in which he worked were more likely to demoralise than discipline him as an investigator, and, accordingly, it is not surprising to find that he passed so rapidly from one subject to another that he quite failed even to notice many great truths, the revelation of which was more or less due to his investigations. His work may be described as consisting in great measure in the accumulation of masses of valuable material, which it was left for others to make effective use of. His mind has been described as of rare quickness and perceptive powers, which led him to the rapid discovery of numerous new chemical substances, but it was not of a philosophic or deliberative cast, and though he made and recorded innumerable observations of primary importance in chemistry, their interpretation was left to others.

It has been pointed out¹⁰ that, though Priestley's ingenuity in devising apparatus and skill in carrying out experiments were very remarkable, and placed him amongst the foremost workers in science of his day, many of his experimental results were highly inaccurate, and his conclusions frequently hastily drawn and erroneous. Berthelot, also, has described Priestley as the enemy of all

theory and every hypothesis, and as drawing no general conclusion from his "beautiful" discoveries. A passage in the concluding chapter of Priestley's great work, however, goes far to discredit this assertion, for he states that "It is always our endeavour, after making experiments, to generalise the conclusions we draw from them, and by this means to form a theory, or system of principles, to which all the facts may be reduced, and by means of which we may be able to foretell the result of future experiments." As a matter of fact, the careful study of his published results leaves little if any ground for doubting that he adopted the best means available for arriving at the truth, and experimented on the lines indicated in a passage written by a contemporary, that is as pertinent to-day as it was during Priestley's lifetime:—"We cannot too much recommend to chemical operators to be exceedingly upon their guard against imposing and deceitful experiments, which frequently present themselves in practice. A circumstance seemingly unimportant, or not easily perceptible, is frequently sufficient to give the appearance of a great discovery, by means of certain effects, which, nevertheless, are found to proceed from some other cause. Chemical experiments depend on so many accessory things, that all of them can seldom be attended to, particularly when the subject is new: hence, we frequently find that very different results proceed from the same experiment, and at different times. We therefore must not decide after the first success; but the experiment must be repeated several times, and even varied till no doubt can remain."¹¹

(To be continued.)

CINCHONA CULTIVATION IN INDIA.

The cinchona plantations are divided into two categories: (1) Government plantations, and (2) private plantations.

Of Government plantations, the Sikkim plantations in Bengal, under the charge of Dr. King, C.I.E., F.R.S., consist of 2342 acres planted with *Cinchona ledgeriana* (1000 acres), *Cinchona* "hybrid" (700 acres), and *Cinchona succirubra* (600 acres). The other Government plantations are in the Madras Presidency on the Nilgiris under the charge of Mr. M. A. Lawson, M.A. These consist altogether of 900 acres, but the area under each variety has not been reported.

The private cinchona plantations are situated in the Bengal Presidency at Darjeeling; in the Madras Presidency at Madura, Malabar, the Nilgiris and Coorg; and in the two Native States of Mysore and Travancore. The area under cultivation on private plantations amounts to 6278 acres. Of these 4807 are in the Madras Presidency, and chiefly on the Nilgiris. The out-turn of bark for the year 1892-93 from the Government plantations was 423,873 pounds, and from private plantations 1,458,707 pounds; total, 1,872,580 pounds.

On March 31, 1893, the total number of mature plants on Government and private plantations was estimated at nearly 10,000,000 trees.—*New Bulletin*.

¹¹ Macquer's 'Dictionary of Chemistry,' article "Laboratory."

¹⁰ Preface to Alembic Club Reprint, No. 7.

TABLET TRITURATES.

Among the modern remedies, or rather means of applying medicines to disease, none seems to have attained such a large share of popularity with the physician as tablet triturates and hypodermics. It is not necessary in a paper of this kind to call attention to any of their advantages as remedial agents, and from the standpoint of the pharmacist alone this would be quite out of place.

Most of the new remedies and special preparations on the market to-day are of such a nature that when their vogue shall have ceased they will go to swell that already large corner in most stores called dead stock. But this is not the case with tablet triturates, for with the outlay of but a small amount, the pharmacist can place himself in a position to supply any demand that may arise for these goods; not only can he supply the demand, but he can do so at quite a large profit to himself over what he would pay the manufacturer, besides doing away with having to keep so many sizes and combinations in tablets always on hand. It is claimed by some that they do not succeed in preparing these goods to equal those of the manufacturers. And while this is no doubt true, yet there is no denying the fact that many pharmacists are turning out tablets of their own manufacture the equal of any made. The wonder is that so small a number are preparing them themselves, when we consider how easily they are made. It is true there are some formulas more difficult to work than others, and that sometimes success does not crown our efforts in a first trial; but by using that discriminating judgment that the pharmacist must possess in order to be successful in his business, there is no reason why he should not easily overcome any difficulty in their manufacture which may arise. Every formula should be carefully noted in a special book, and every detail of manufacture carefully observed.

Many have failed to make as smooth tablets as they would like, simply because the diluent was not in fine enough powder. In making tablets the powder should be fine enough to pass through a 120 sieve. The finer the powder the smoother the tablet.

Some have not secured adhesion enough in the tablet for the reason that they have tried to make one diluent or base work satisfactorily with every formula, or by using the wrong strength of menstruum for moistening. Others have made the mass too soft, and been disappointed with the resulting product. If on mixing the active ingredients with the diluent and menstruum we find that the mass is not adherent enough, we must look for the remedy in two directions:—

1st. In so changing the diluent or base that we may thereby increase its adhesiveness.

2nd. In changing the strength or character of the liquids used to moisten, so as to bring about greater adhesion.

In the manufacture of tablet triturates many have failed from the simple reason that they have sought to use sugar of milk exclusively. This is no more than would naturally be expected from such a procedure, for while milk sugar serves an excellent and important

part in the manufacture of many tablets, it is necessary often to combine it with varying quantities of cane sugar in order to secure the best results; while in making tablets like permanganate of potassium, the use of any kind of sugar is inadvisable, and recourse must be had to precipitated chalk or kaolin, and water be used to moisten the mass. In making hypodermic tablets, pure powdered cane sugar alone should be used as a base, and alcohol to moisten. And if the sugar is fine enough and care is used, no difficulty will be found in obtaining a product that is excellent in appearance, and equalling those of the market in every way.

Tablets may thus be properly divided into four different classes:—

1st. Those in which cane sugar in its finest possible powdered form should be used as the base or diluent.

2nd. Those in which powdered milk sugar is used.

3rd. Those in which 5 parts of milk sugar and 1 part or more of cane sugar is used.

4th. Those in which precipitated chalk or kaolin should be used.

For moistening liquids the following are employed:—alcohol; alcohol 20 parts, and water 1 part; water; ether; chloroform.

Some recommend mixtures of ether and alcohol, and chloroform and alcohol, which will be found very useful sometimes, but it is difficult to see any advantage in using benzine, as is sometimes recommended. The largest class of tablets are made with base or diluent No. 3, for example, tablets of calcium sulphide of bismuth subcarbonate, of bismuth subgallate, and of Dover's powder. These, besides being representatives of the largest class, are also the easiest to make.

The only tablets with which the pharmacist is liable to have any trouble are those containing extracts, fluid extracts, and tinctures. These may often appear troublesome from several causes:—

1st. The large amount of liquid ordered, as in the case of tablets containing tinctures.

2nd. Where the amount of solid extract exceeds one third of the bulk of the tablet, difficulty will be found in making a nice tablet.

In the first case, where the tincture is strongly alcoholic, it is best to mix it with a portion of the diluent, allow a portion to evaporate, then reduce to powder or smooth mass, and add the balance of the diluent, when, if necessary, the mass can be moistened with alcohol and made into tablets. Sometimes the menstruum of the tincture is too aqueous to admit of this treatment; in this case it is necessary to use an amount of fluid extract equal in medicinal strength to the tincture. By this method the advantage of the lesser bulk of the amount of fluid extract necessarily overcomes the difficulty. With this class of tablets pure sugar of milk will generally be found best, but sometimes they may be found too friable and break too easily. This may be remedied, and a harder tablet made, by using milk sugar and cane sugar in the proportion of 4 or 5 of milk sugar to 1 of cane sugar.

It will hardly be found possible to make nice tablets with solid extracts where the amount of extract exceeds one third of the weight of the tablet.

Another class of tablets consists of those of calomel, corrosive sublimate, mercury and chalk, salicylic acid, etc. This class includes all those that are affected by contact with metals, and a rubber or glass plate should be used in making them. Otherwise they require no special treatment, but are easily made with sugar of milk, or sugar of milk and cane sugar as an excipient.

In making tablets containing such resins as podophyllin, etc., it is best to moisten with water, for the resin partially or wholly dissolves in alcohol and makes a hard, insoluble tablet. In making aloin tablets water will also be found the most satisfactory as a moistening agent.

Another class of tablets that are much used consists of tablet saturates. These are made by moulding in the proper sized plates tablets composed of diluent alone, and keeping them in stock. When prescribed, a specified amount of active ingredient ordered is dissolved in some suitable solvent, such as ether, chloroform, alcohol, or varying mixtures of each as required, and the proper amount added to each tablet. Or a certain amount of fluid extract or tincture is added to each tablet.

Hard rubber plates or moulds are preferable; they cost more, but can be used in all cases, while the metal plates are sometimes not advisable. It is not necessary to have a great number of plates, but plates of different sizes to make various sized tablets should be kept on hand.

In making tablets, the proper amount of the active ingredients wanted should be carefully weighed out and reduced to a fine powder, and the quantity of diluent necessary added; these should be carefully mixed by trituration in a mortar. Then moisten with a suitable agent, and having laid the moulding plate on a glass or pill tile, rub the mass firmly into the holes until all are filled, smooth over the top, and dust with a small amount of dry diluent, next turn the plate over and smooth the surface of the tablets carefully, then place the plate on the ejecting plate, and with a steady movement force the tablets out, allow them to stand until dry enough to move them, place on paper, and allow to thoroughly dry. In the different sized plates, different amounts of diluent must of course be used, and this is also true of different combinations in the same plate.

The following process is the most satisfactory for determining the amount of diluent necessary to make any size tablets. Take enough of the active constituents of the tablets to make a given number, with this mix a quantity of the diluent that you know is insufficient, moisten with suitable liquid, and rub into the holes in the plate intended for use. Of course this will not fill the holes (twenty-five, or any convenient number, should be made for experiment); then moisten an excess of diluent and fill the balance perfectly, next smooth off both sides of the tablets and place on the ejecting plate and force the tablets out. Allow them to dry thoroughly, and weigh; the weight of the tablets less the amount of active ingredients gives the weight of diluent necessary to make a given number of tablets.

Another class of preparations which are sometimes called for, and can be readily made, consists of tablets composed almost entirely of the medicinal part. In this case it is necessary to rub the powder up with some adhesive substance like acacia, and moisten as in making a pill mass, then rub into the plate and otherwise treating as a tablet triturate. In this manner nice tablets can be made, and very easily. While this is not exactly a tablet triturate, being more in the nature of a lozenge, it is a very efficient way of making this class of goods. In fact, with a plate large enough, very excellent lozenges can be turned out by this process. But on account of the cost of plates of this size, the lozenge cutter may be recommended, as it is much cheaper, or easily improvised.

If the pharmacist will use care and judgment in this class of work, there is no possible reason why he should not be successful in making any possible combination of tablet triturates. The difficulties that arise cannot deter the working pharmacist, who believes in himself, from ultimate success. The material used in the experiment is not lost, but can be rubbed up thoroughly with a sufficient quantity of medicine and diluent to make the number of tablets required. Otherwise it could not be used, as it is readily seen that the amount of medicine is not evenly distributed throughout the tablets in the trial given.

In making tablets it is always best to make up an excess of mass, as it is much better to work with an excess than to attempt to work with an amount representing exactly the quantity desired.

In making such tablets as those of permanganate of potassium, and other substances that are decomposed more or less by organic matter like sugar or sugar of milk, kaolin is the best vehicle, and it is easily worked.

In some of the tablets similar to those in which the medicinal part composes the larger part of the tablet, it will be found necessary to use some adhesive to hold them together; for this purpose use acacia, and moisten very carefully with water.—*Druggists' Circular*.

THE OPIUM TRADE OF ASIA MINOR.*

Opium is perhaps the most interesting, the most valuable, and the most famous product of Asia Minor. This substance, which resembles a resinous gum, is extracted from the capsules of poppy-heads. Incisions are made in the capsules after the fall of the flowers, and the juice which runs from them is then dried and made up into blocks of various sizes. These are covered with leaves and sent in special bales to the market of Smyrna.

The poppy is usually cultivated in the central regions of Asia Minor on firm soil of sandy or chalky clay, richly manured. Several sowings are made throughout the course of the year, but the crops are grouped under two general denominations, the autumn and the spring crops. The autumn sowings are begun towards the end of the month of September, and produce the greater part of the harvest.

* From a report of the French Chamber of Commerce at Smyrna.

The seed is sown in fields which have been ploughed or dug up, and when the plants have appeared a great many are destroyed in order to assure to each plant a clear space of about 75 centimetres. The earth ought to be stirred and hoed three times over before the time for picking the poppy-heads has come.

After the month of November the snow almost always covers up the young plant, which is thus preserved from frost and the severity of the winter until the snow melts, that is to say, until March. It then grows vigorously until it becomes from 1 to 1½ metre in height. Each plant produces from 5 to 30 globular capsules, which are generally oval in form. The flowers are large, solitary at the top of the ramifications, and composed of four or five petals set in the form of a cross, and crumpled until they expand. They are of all shades from white to red. When the capsule is ripe it takes a pale yellow tint. This is the moment for making the incisions. They are always made at sunset; the juice which oozes from them in the form of tears is collected next morning, at dawn, in shells. It is then dried and moulded into the form of blocks, which are wrapped in leaves of the same plant. From its first appearance until the moment of harvest, the plant is exposed to all the intemperance of the weather, excess of rain or drought, of cold or heat, violent winds, etc., and it is thus peculiarly liable to be injured on the nights which precede the incision of the capsule.

The seed is sown two or three times in spring, between the beginning of February and the end of April. This crop requires greater uniformity of weather especially frequent rains. The consequence is that the spring sowings are more delicate, and their product is sensibly inferior to that of the autumn crop.

The blocks are left to dry, and are then arranged in high baskets containing about 75 Kilogs., with certain leaves which have the property of keeping the opium in good condition, and of preventing the blocks from sticking to one another. The bales are then forwarded to Smyrna and Constantinople to be sold there to exporters. Turkish opium has produced during the last fifteen years an average of 6000 bales. One single year, which was absolutely exceptional, produced 11,000 bales. But this year we have only 3000, a figure just as abnormal as the preceding.

These are the various varieties of opium and their respective values:—

1. *Malatia, Tokat, Zileh*.—Quality extremely fine, and the paste much appreciated by Chinese smokers for its delicate flavour. Amount of morphine very small, varying from 8 to 11 per cent., which is only obtained by means of a special selection.

2. *Boghadiok*.—The best quality of Turkish opium, paste delicate and fine, greatly appreciated, especially by the smokers of Central America.

3. *Yerli*.—All opium which is grown in the neighbourhood of Smyrna is called Yerli. It is less valued than that of Boghadich, but is rich in morphine. This is the quality which is used for drugs and in medicine.

4. *Chaiu*.—This kind is so like that of Yerli that it may be included in the same category.

5. *Salonica*.—The cultivation of opium at Salonica is of relatively recent date. It has greatly extended, and produces about 800 bales per annum, half of which, of very fine quality, is more appreciated than even the Boghadich.

6. *Karatissar*.—This is the district which produces the most opium, and supplies, on a large scale, the trade of England, America, and Holland. The quality of this variety is very good; the morphine varies from 9 to 12 per cent.

7. *Adeth*.—Average quality brought from all parts of the interior. The Turkish word "adeth" means "usual." It represents the ordinary type, which is easily sold for China and America, and the amount of morphine is almost uniformly 9·5 per cent.

8. *Chinguiti*.—This name is given to a quality of opium from various parts of the interior. It is opium mixed with foreign matter; it contains morphine sometimes to the extent of 9 per cent.

9. *So so*.—Under this name are designated those opiums which are bought in the condition in which they arrive from the interior. There is a mixture of five kinds and of Chinguiti. The morphine is from 9 to 11 per cent. It should be noted that mouldy opiums of bad appearance, which are rejected, are often found figuring afterwards in the category of the "So so's."

These are, approximately, the quantities exported each year:—

	Bales.
For England	1,000
„ North America.....	2,000
„ Central and South America.....	600
„ Spain and her Colonies.....	500
„ Holland	500
„ France	300
„ Germany	300
„ Italy	100
„ Other countries.....	100
Total, about.....	5,400

or cases representing, at the average price of 48 francs the kilogramme, 11 millions of francs.

The permanent stock, at the end of the season, which closes on the 15th of June, is valued approximately at 1000 bales between Smyrna, Constantinople, and the producing districts. The maximum price of opium of late years has been 40 francs the kilogramme, and the minimum price to which it has fallen has been 18 francs; but this fall only occurred once, and lasted but a very short time. In any case we are very far from that period when this article, which used to play a preponderating part in the export trade of Smyrna, sometimes reached very high prices indeed. The price used to go up and down, producing great profits and serious losses. But the speculative spirit which used to mark the opium trade has entirely disappeared, the variations of price are slight, and only follow the normal law of supply and demand, in consequence of the extent of the crops and the requirements of the consumer.—*Board of Trade Journal*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, DECEMBER 22, 1894.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Sothe Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge,—17, Bloomsbury Square, London, W.C.

PHARMACEUTICAL TESTING.

THE circumstances of the case reported at page 536 afford an instructive illustration of the desirability of testing the various materials which the chemist has to deal with in the ordinary course of his business. Ordinary tradesmen are responsible for the nature and quality of the articles they sell, and though possessing no capability of applying tests other than those acquired by familiarity with the goods they deal in, they are liable to prosecution under the Food and Drugs Act if their wares are not what they are represented to be. In the case of chemists the necessity for giving attention to this matter is still more imperative. The very title under which they carry on their business, and to the use of which they claim exclusive right, conveys the idea that they are able to detect impurities in the articles sold by them. That capability should be more generally exercised by chemists, not only for the sake of enabling them to guarantee the quality of every article they sell and to inspire the public with confidence in them, but also for the sake of protecting themselves against the unpleasant consequences which may result from inadvertently selling a defective article.

At the present time, when factory-made chemicals and pharmaceutical preparations enter so largely into the stock-in-trade of the chemist, such precautionary measures are the more indispensable. Even articles made by the chemist may deteriorate by long keeping, and in such cases periodical testing is the only means by which absolute certainty as to quality can be secured. Nothing less than that ought to satisfy the conscientious chemist desirous of maintaining

his reputation and of avoiding the risk of being charged with selling adulterated or defective articles. The excuse sometimes made for neglecting to examine articles, that too much time would be taken up, is not entitled to much consideration, for the necessary operations may be carried out in a very simple manner in the greater number of instances, and the chemist has always at hand appliances which can be turned to account for the purpose. Not long since Mr. BARNARD PROCTOR published an excellent manual of pharmaceutical testing, in which he described methods of examining almost all the articles which are ordinarily met with in a chemist's shop. He showed, also, how such work can be carried out, with the materials and appliances usually to be found at the dispensing counter and by such operations as are in daily use in the work of dispensing. His opinion is that every pharmacist should test his chemicals occasionally, to see that their quality is up to the required standard. We fully endorse that opinion, and would impress upon all chemists the great importance of giving attention to it.

LECTURES ON DIPHTHERIA.

MR. LENNOX BROWNE gave the second lecture of this course on Tuesday at the Central London Throat, Nose, and Ear Hospital, when "Doubts in Diagnosis as determined by clinical observation," were considered. Commenting on a general confession on the part of recent writers that the clinical distinctions between true and false diphtheria were so difficult, and even impossible of differentiation, as to be only settled by a bacteriological examination, the lecturer refused to accept such a wholesale surrender of the clinical fortress.

He willingly admitted, however, that it was only by careful comparison of both physical and functional symptoms of the varieties of membranous sore throat, which were characterised by certain micro-organisms alone or associated with the diphtheritic bacillus, that medical men could hope to form a more accurate opinion than at present obtained at the bedside of the patient, and so to reduce the admittedly large proportion of cases treated as diphtheria which were not of that nature. Until that was done, not only were the returns of mortality very misleading, but the effects of treatment, whether by antitoxic serum or any other remedy, could not be properly determined.

The lecturer then proceeded to discuss the differential diagnosis from the various manifestations of the membrane in the throat, and also the varying effects on the general system. These were naturally of a technical nature, but they clearly indicated that by pursuing the lines laid down, there was a possibility of arriving at a more satisfactory degree of accuracy.

PRESENTATION OF A PORTRAIT OF PROFESSOR DEWAR.

THE *Times* reports that the Master and Fellows of Peterhouse gave a dinner last Friday to celebrate the presentation to the College of a portrait of Professor DEWAR, painted by Mr. ORCHARDSON. The portrait is to be hung in the combination room, and will be a pleasing extension of the traditional connection of the College with scientific pursuits, in which the name of HENRY CAVENDISH stands prominent.

PLYMOUTH, DEVONPORT, STONEHOUSE AND DISTRICT CHEMISTS' ASSOCIATION.

WE learn that a trade defence section has now been formed, in connection with the Chemists' Association recently formed for Plymouth, Devonport, Stonehouse, and the adjoining district, on the following lines:—The members, who are all chemists in business, give a guarantee that they will subscribe 10s., payment of that sum to be made when it is necessary to undertake the defence of a prosecution. If one of the subscribers should be prosecuted, he is to communicate with the Secretary, who will call a meeting of the guarantors to consider the circumstances of the case. If a sufficient majority thinks that with the aid of a solicitor the case can be justifiably defended, the whole of the guarantors are to pay their 10s.; if the case is not thought a good one, it would not be entertained; any balance left over would be returned equally, the decision of the majority to be final as to whether action is to be taken or not. An executive committee has been formed consisting of C. J. PARK, President; C. T. WEARY, J. BARGE, R. F. ROPER, J. G. NETTING, and P. A. KELLY; J. HARVEY BAILEY, Treasurer; JAMES COCKS, Hon. Sec., who are arranging with a competent analyst and solicitor who will give ordinary advice gratis and only be paid for professional services in case of action being taken. Members only of the Association are entitled to join, and almost the whole of them have done so.

MEDICAL CONGRESS AT CALCUTTA.

THE Medical Congress to be opened at Calcutta on Monday next promises to be very successful so far as attendance is concerned, no less than five hundred tickets having been issued already, and all the Government medical officers who can be spared to attend have been given fifteen days' leave of absence for that purpose. The *Times* reports that during the Congress Mr. ERNEST HART proposes to hold a conference of leading Mohammedans to consider the subject of cholera at Mecca with reference to Indian pilgrims.

ROYAL SOCIETY.

IN the course of a somewhat lively correspondence in the pages of the *Times*, "A Critic" tells "a little story of the actual management of the Royal Society." The latest recipient of the Rumford medal, it is stated, asked the treasurer, half in jest, what had become of the cheque for £80 which usually accompanied the medal. The treasurer was surprised and said no such payment was ever made, being confirmed on this point by the secretary. A week or two later, however, the treasurer, addressing the medallist, informed him that he had been right about the money, though it had not been paid on the last three occasions. The medallist said the Society might as well keep the money, as its funds seemed low, but the treasurer said this could not be, as the Rumford funds were trust funds. He therefore proposed to pay the medallist "£50" instead of £80. Comment upon such peculiar financial methods is unnecessary.

FRIGOTHERAPY.

ACCORDING to the *British Medical Journal*, M. RAOUL PICTET has extended his application of low temperatures to the treatment of dyspepsia, under the name of "Frigotherapy," and being a sufferer from indigestion, has ascertained, by experiments upon himself, that exposure to a very low temperature for several minutes relieves indigestion and excites hunger. By repetition of the treatment his stomach affection was entirely cured.

DEATH OF PROFESSOR FLÜCKIGER.

THE EDITOR desires to give expression to his sense of obligation to Professor SCHAEER, for having so promptly responded to his request to furnish an obituary notice of his former teacher and predecessor at the University of Strasburg.

SCIENCE PROGRESS.

Science Progress for December contains articles on the "Artificial Hatching of Marine Food-Fishes," by W. C. MCINTOSH, F.R.S.; the "Molecular Weight of Liquids," by JOHN SHIELDS, D.Sc.; the "Origin of Vascular Plants," by Professor D. H. CAMPBELL, Ph.D.; "Recent Researches in Thermal Metamorphism (Part II)," by ALFRED HARKER, M.A.; "Continuous-Current Dynamos (Part II)," by C. C. HAWKINS, M.A.; and "On the Morphological Value of the Attraction-Sphere (Part II)," by J. E. S. MOORE, A.R.C.S. A correction of a former article on "Measurement of Temperature," is also contributed by E. H. GRIFFITHS, M.A., and "Chemical Literature for October, 1894," forms an appendix.

MISCELLANEOUS NOTES.

At the annual business meeting of the north branch of the Chemist and Druggist Association of Ireland, on Thursday, December 6, Sir JAMES H. HASLETT, J.P., was elected president for 1895, and it was decided to hold the annual social meeting in January, a sub-committee being appointed to carry out the arrangements.

It is proposed that the London County Council shall establish a municipal laboratory where, in cases of suspected cholera and diphtheria, bacteriological examinations shall be conducted.

THE Metropolitan Asylums Board has decided that its managers shall accept the offer of the Royal College of Physicians and Surgeons to supply antitoxin for the treatment of diphtheria. Public funds will be therefore applied to maintain a number of horses for the supply of serum.

THE death of ARTHUR COWPER RANYARD, editor of *Knowledge*, occurred on Saturday last, after a brief illness. Mr. RANYARD was a skilful astronomer and the intimate friend of the late RICHARD A. PROCTOR.

MR. G. T. W. NEWSHOLME, member of Council of the Pharmaceutical Society, has been re-elected unopposed as a member of the Sheffield Board of Guardians.

THE Standards Department has been supplied with a new set of standard metric weights, constructed of iridio-platinum and ranging from 500 grammes to 0.01 gramme. A primary standard weight of 10 grammes, verified at the Bureau International des Poids et Mesures, has also been provided.

H. W. COLLIER, son of Mr. H. COLLIER, Pharmacist to Guy's Hospital, has obtained at the recent examinations of the University of London the degrees of Bachelor of Medicine and of Bachelor of Surgery.

At the recent Scholarship examinations at Cambridge, STANLEY DE JERSEY LENFESTRY—third son of Mr. W. GIFFARD LENFESTRY, a member of the Pharmaceutical Society, and for some years local secretary at Faversham—was elected to an open mathematical scholarship at Peterhouse.

At a meeting of the Liverpool Medical Institution on the 6th inst., Dr. CATON reported two remarkable cases of lead poisoning arising from the use of water containing lead, amounting in one instance to two, and in the other to as much as three grains in the gallon.

In celebration of the quinqucentenary of the Salters' Company, the Court of the Company has arranged a scheme for establishing Research Fellowships in Chemistry in connection with the City and Guilds of London Institute, in addition to those at St. Thomas's Hospital and the Research Laboratory of the Pharmaceutical Society.

It is reported that as many as one hundred and fifty persons, living at Freiberg, in Saxony, are suffering from the effects of arsenic contained in breakfast rolls. An inquiry is being conducted.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

A meeting of this Association was held at the Royal Institution, Liverpool, on Thursday, December 13. The President, Mr. J. J. Smith, took the chair.

Mr. T. H. Wardleworth showed specimens of Garcinian kola, which the Kew authorities had identified as kola, though he himself was disposed to think they belonged to the monocotyledons. He would probably refer to them again at the next meeting.

Dr. C. Symes expressed the opinion that, in view of the changes that were proposed in the next edition of the Pharmacopoeia, pharmaceutical associations in the provinces should take up the matter; and suggested that the Liverpool Association should devote an evening of the session to a discussion of the subject.

An address was then given as follows:—

THE DISTRIBUTION OF PLANTS.

BY PROFESSOR R. J. HARVEY GIBSON, M.A.

After explaining that distribution is not haphazard, but is controlled by certain influences and is in obedience to certain laws and conditions, a chart was shown in which the various influences were set forth—(1) Environment—*a.* Inorganic: temperature, moisture, light, soil; *b.* Organic: other living things, symbiosis, neighbours, parasites, man; (2) Powers of dispersal; (3) Barriers to migration; (4) Past distribution of plants.

Tropical plants have intense vitality, and form dense bushes and forests of high trees. In warm temperate regions there are no palms and heat-loving plants, but wheat and tropical grains, olives, etc. In temperate regions shrubs and greensward abound, and wheat and other northern grains grow. The sub-Arctic zone produces berries and pines, and the Arctic zone mosses, lichens, saxifrages, etc. Moisture and temperature together also determine distribution.

The influence of moisture was next referred to. In very dry regions succulent plants, which lay up stores of water and are covered with a leathery integument to prevent evaporation, are found. A wet condition produces an absence of leathery, spiny, and dry characters, and also of hair, bloom, and wax. A tropical fernery is typical; ferns seek shade and dampness. The influence of neighbours is obvious, and a struggle for existence is continually taking place. The annual, in competition with the perennial, becomes crowded out.

Man produces and introduces, sometimes assisting and sometimes limiting distribution. The various means by which seeds and fruits are distributed were described, and examples shown.

Coming to barriers to distribution, a chart was shown pointing out that in the struggle the higher plants were beating others. Views of Bournemouth Valley and of parts of Lancashire were shown. In the former place tropical trees grew in not very ancient times, and in the latter, remnants of tree ferns and fossils of reptiles had been found unlike anything now on the earth. The lecturer then proceeded to deal with the astronomical and geological evidence of the Ice Age of 250,000 years ago, and pointed out that, from the fact of there being no plants peculiar to this country,

it was evident that it had once been connected with the Continent.

The lecturer concluded with illustrations and descriptions of the different types of plants which occur principally in the different parts of Great Britain, and the address was copiously illustrated throughout with lantern slides.

A vote of thanks was accorded, and Professor Harvey Gibson afterwards replied to various questions.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The second meeting of the seventeenth session was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Wednesday, December 12, at 9.15 p.m. Mr. Alexander Sutherland, President, in the chair. There was a very large attendance.

The minutes of the last meeting were read and approved.

The following papers were read:—

NOTE ON CARBOLIC ACID.

BY GEORGE COULL, B.Sc.

About six weeks ago a complaint was made to me that the carbolic acid supplied to a certain institution had caused one of the medical staff to contract an eczematous affection on his hands, whereas the use of another acid enabled the operator to work with it without any ill-effects occurring. Some five samples (all of them of different manufacture) were, therefore, procured, and a detailed examination made. It is on the material accruing from this investigation that the present note is founded.

The two most commonly used tests for valuing carbolic acid are its boiling point and its melting point, besides which an approximate assay of the acid may be made by means of solution of bromine.

The samples examined were designated as follows:

1. Granulated phenol. M. pt. 40° C.
2. Pure carbolic crystals or absolute phenol. M. pt. 40° C.
3. Absolute phenol.
4. Acid carbolic, purest.
5. Absolute phenol. Solid at 104° F.

On the label of No. 3 was kindly given a definition of absolute phenol, viz., "Absolute phenol consists of carbolic acid in a state of extreme purity." The label of No. 5 also stated that it was carbolic acid in a state of great purity and free from water, while across No. 4 was imprinted the touching, and now, alas! too familiar legend—"Made in Germany."

Boiling Point.—The boiling point of carbolic acid given in the British Pharmacopœia is "not higher than 371° F. (188° ·3 C.)," and in the United States Pharmacopœia "not higher than 188° C. (370° ·4 F.)." From a comparison of the boiling points in other pharmacopœias as shown in Squire's Companion (16th ed., p. 16), it is seen that with the exception of the Codex (187° – 188°) these are the two highest allowed. The others mostly average 184° ; the Danish, German, and Russian standards are the most stringent in requiring a low boiling point, the latter two being 178° – 182° ,

while the former is 178° – 180° . The boiling point stated in different text-books, etc., also varies to a certain extent, although the figures there given are supposed to apply to a pure definite chemical body. Morley and Remsen give it as 180° , Bernthsen (2nd ed.) and Thorpe's Dict. as 181° , Watts' Dict. as 181° ·5, Allen's 'Org. Anal.,' and Roscoe and Schlorlemmer as 182° , and Richter as 183° .

It is possible that these differences may be accounted for by some observers working with a purer acid than others, or by some using a more refined method than others. These discrepancies indicate the necessity for the greatest care and accuracy in all chemical work, more especially where there is any likelihood of a communication being accepted as authoritative. It is further evident that there will always be variations in the observed boiling points of organic substances until there is a definite fixed method of determining this constant, which all chemists must follow.

In very accurate determinations, besides the correction for the cooling of the mercury column not in the flask and for barometric pressure, there is another recently noticed by Lord Kelvin for the expansion of the thermometer bulb caused by the pressure of the mercury. For pharmaceutical purposes it may be assumed that these corrections are unnecessary refinements. I shall, therefore, simply state what occurred when the acid was heated in a small distillation flask with the bulb of the thermometer so placed that it was completely surrounded by the vapour, but not dipping into the acid. The thermometer used was lent to me by Dr. Dobbin, chief assistant to Professor Crum Brown, and may be relied upon as being accurate.

After melting, in the case of every sample of acid tested, the temperature rose rapidly to about 177° , and then more slowly to 180° , at which temperature the thermometer remained steady until the great bulk of the acid came over, and then it slowly rose to 193° – 197° , the highest point being reached when the bottom of the flask was dry. This high temperature may have been due to a superheating of the vapour, or caused by the presence of a very small quantity of one of the cresols. There are three isomers of this homologue of phenol, the ortho, meta, and para modifications, whose boiling points are respectively 188° , 201° , and 198° .

It will be seen that determining the boiling point of commercial carbolic acid in the ordinary way does not give a definite result, owing to the circumstance that it is not absolutely pure. The thermometer bulb was therefore immersed in the acid, and another trial made, when it was found that all the acids boiled at the temperature 181° – 181° ·5, until fully 80 per cent. was over, and the bulb no longer dipped into the liquid, but was surrounded by vapour. This, I suggest, should be taken as the temperature at which the acid boils, being more constant than the temperature of the vapour given off.

Melting point.—In regard to the melting point, the British Pharmacopœia occupies a still more humiliating position in demanding that carbolic acid shall melt at a temperature not lower than 91° ·5 F. (33° C);

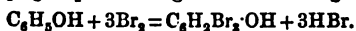
this is lower than that of any other pharmacopœia. Squire (*ibid.*) compares the melting point also as given in various pharmacopœias. The Swiss and French require the highest melting point, namely, 42° (the m. pt. of absolutely pure phenol); some give a range of temperature between the limits of which the acid should melt, which I think is a mistake. It ought to be stated, as in the B.P. and U.S.P.—not lower than a certain temperature—anything above that, of course, could not be taken exception to.

The melting points of the above-mentioned samples were taken in the ordinary way by means of a capillary tube (containing the substance) fastened to the bulb of a thermometer and immersed in water. The following are the results:—

No.	1	2	3	4	5
Fahr.	101°·5	103°	103°	100°·5	102°·5
Cent.	38°·6	39°·4	39°·4	38°	39°·2

The determinations were effected with a Fahrenheit thermometer, then calculated to the Centigrade scale. It seems to me that the melting point is a more definite, reliable, and easily applied test than the boiling point.

Assay of Carbohc Acid.—Landolt,* in 1871, first made use qualitatively of the reaction between bromine and phenol as a means of proving the presence of carbohc acid in a well-water, as little as 1 in 43,700 being capable of detection. In 1877, Koppeschaar† devised a volumetric process for the determination of phenol based on the same reaction, but instead of using bromine water he employed a solution of alkaline bromide and bromate, from which the bromine was set free by hydrochloric acid. An excess of the previously standardised bromate solution is added to a known quantity of carbohc acid dissolved in water, hydrochloric acid is added, and then potassium iodide in excess; the excess of free iodine and, therefore, of bromine, is then ascertained by titration with sodium thiosulphate. The amount of free bromine is to be deducted from the total bromine added; this gives the quantity that has replaced part of the hydrogen of the phenyl group according to the following equation



It has been shewn by Weinreb and Bondi‡ that the hydrogen of the hydroxyl is also replaced by bromine, forming tribromophenol bromide. But although this takes place it is said not to interfere with the usefulness of Koppeschaar's process, for tribromophenol bromide under the action of potassium iodide and hydrochloric acid gives up its hydroxylic bromine, and tribromophenol is the final product of the reaction. Hence the above equation holds good, and is adopted in determinations of carbohc acid; it shows that one molecule (94 parts) of carbohc acid react with three molecules (480 parts) of bromine.

This process has been adopted in the last edition of the United States Pharmacopœia,* as a means of valuing the acid. The following determinations were performed in the manner there described,* and in every case the result came out over 100 per cent., the standard fixed in the Pharmacopœia being 96 per cent.

Percentage of Phenol by Koppeschaar's process.

1.	2.	3.	4.	5.
102·2	101·9	101·7	101·8	102·7

It may be mentioned that the formation of tribromophenol is promoted by the use of excess of bromine and shaking for half an hour. The experiment was tried of shaking for five minutes only, with the result that the figures came out about one per cent. less than in the above table.

This high result is possibly due to the formation of a small quantity of a higher substitution product, or it might be caused by the incomplete decomposition of the tribromophenol bromide.

Conclusion.—From the results stated above, it will be observed that carbohc acid may be obtained commercially, and, it may be added, at a moderate price, in a condition of purity far in advance of what the B.P. demands. I would therefore suggest that our standard be raised, by requiring that the melting point be not lower than 102° F. (38°·8 C.), and that the boiling point be not higher than 359°·6 F. (182° C.), the bulb of the thermometer being immersed in the acid. These two constants are not more exacting than necessary, as it has been demonstrated above that carbohc acid can be easily obtained having these characters. The desirability of including Koppeschaar's process for the volumetric determination of the acid in presence of water, I would leave for further consideration. In my hands it has always registered too high; further experiment may elucidate the cause of this, and if the disturbing factor can be discovered the process might eventually be adopted. At present, as the United States Pharmacopœia says, it gives only an approximate value of the acid.

A NOVEL IMPURITY IN CHLORAL HYDRATE.

BY ALEXANDER GUNN.

My attention was recently drawn to a bottle of chloral hydrate standing on a shelf among others. The bottle was of white glass and showed yellow spots among the contents, not only where the light struck, but in the hidden parts as well. Only one bottle showed the spots. The crystals were moist and distinctly acid to litmus. The yellowness gave the crystals the appearance of yellow crystals, but it was found to be only superficial. The yellow crystals were separated, and gave evidence of free hydrochloric acid. The appearance suggested the result produced by the action of hydrochloric acid on iron, and, on testing for this metal, its presence was at once demonstrated. On placing a quantity of the ordinary white crystals in a test tube, and adding a minute fragment of iron, it was found that, after standing a week, there was a production of yellow patches exactly

* *Berichte*, iv., 770 (Year Book, 1872, 201).

† *Zeitschrift für Analytische Chemie*, xv., 233 (Year Book, 1877, 121).

‡ *Monatsh. Chem.* vi., 506 (Year Book 1886, 108.)

* U.S.P., 1890, p. 10.

similar to those observed in the stock bottle. A minute black substance was found among the yellow crystals, but was lost before it had been examined. There seems little doubt, however, that the colouration was due to the accidental presence of a particle of iron in the stock bottle.

NOTE ON A SEIDLITZ POWDER.

BY ALEXANDER GUNN.

A box labelled "Improved Seidlitz Powders" was handed to me for examination. On proceeding to dissolve the contents of one of the blue papers in water, it seemed to take a long time, and, on looking closely at it, there was evidence of decomposition and a heavy precipitate was falling. On applying heat, there was active effervescence, the precipitate became denser, and rapidly subsided on removing the heat. The precipitate was found to be magnesium carbonate. On heating some of the original powder on platinum foil, there was no sign of charring. Sodium, sulphuric acid, and carbon dioxide were found. The powders, therefore, consisted of magnesium sulphate and sodium bicarbonate. The white papers contained tartaric acid. Evidently there had been a mistake, or else it was a bold attempt to cope with the cutting system and its cheap prices. One wonders that the makers should expect the unusual effect of trying to dissolve the contents of the blue paper to pass unnoticed. My thanks are due to Messrs. Fletcher, North London Chemical Works, in whose research laboratory this and the foregoing note were prepared.

CODEINE SULPHATE WITH HYDROBROMIC ACID.

BY WILLIAM DUNCAN.

The following prescription was handed to me for an explanation of the decomposition which ensues on dispensing:—

R. Codeinæ sulphatis	grs. ix.
Acid hydrobrom. dil.	℥iv.
Liq. strychninæ	℥i.
Glycerini	℥iii.
Inf. rosæ acid.	ad. ℥iii.

Concentrated infusion was used. On dissolving the alkaloidal salt in water and adding the hydrobromic acid, abundant crystallisation resulted. The crystals re-dissolve on heating, but again separate out on cooling. On adding the other ingredients of the prescription the crystals slowly and almost completely re-dissolve, the glycerin probably exerting a powerful solvent action. The crystals, washed free from adhering acid, were found to be neutral to litmus, readily soluble in water, but only sparingly in dilute hydrobromic acid. Chemical examination proved them to be codeine bromide. It seems, therefore, that codeine bromide resembles strychnine and other alkaloidal salts in being much less soluble in acid than in water. It is therefore advisable in dispensing alkaloidal salts with excess of acid to put on a "Shake the Bottle" label to avoid any risk from unforeseen crystallisation.

The reading of the papers was followed by a discussion, taken part in by Messrs. Boa, Coull, Duncan, Hill, McEwan, Sutherland, and White.

Mr. Hill then exhibited and described an *Aspidistra lurida*, which had flowered in the Society's House. It showed the curious dull-purple flowers, with bell-shaped eight-cleft perianth characteristic of this genus of the *Liliaceæ*. The flowers arise from the underground rhizome on one-flowered short peduncles, and seem to be resting on the soil in a position well adapted for fertilisation by the agency of snails, as was proved by Dr. John Wilson a few years ago. Though the plant is a very common one in cultivation, the flowers are not often seen.

Mr. Hill also read an amusing paragraph from a book on "Old Violins and their Makers," which had been sent by Mr. D. B. Dott. The interest of the paragraph consisted in its extraordinary statements with reference to alcohol used in making varnish. One specimen was as follows: "If wood spirit has been added, it combines so perfectly that its presence cannot be determined by any known process; but this latter does not injure the solving power of the alcohol."

On the motion of the chairman, a cordial vote of thanks was awarded to the authors of papers, and to Messrs. Hill and Dott, and also to Mr. Duncan, by whom the proceedings had been arranged.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on Thursday, the 13th inst., Mr. John McMillan, Hon. Vice-President, in the chair, the following paper was read—

NOTES ON COMPOUND SYRUP OF THE PHOSPHATES.

BY WM. WATSON.

Being persuaded that there is great diversity in the quantities of iron and lime phosphates present in commercial samples of this syrup, I decided to endeavour to assay the same. Two samples in particular which I have come across lately, bright in appearance, but with little or no astringent taste in them led me to think on this subject. The demand for cheapness, as also the want of an official recognition, leaves an open way for the sale of worthless imitations of this valuable medicine. In referring back to the *Pharmaceutical Journal*, I found that eighteen years ago Mr. Howie gave an able and exhaustive paper on "The Phosphate Syrups." On that occasion, he found by volumetric determinations that out of nine samples, the quantity of ferric phosphate varied from .169 gr. to 1.118 gr. per fluid ℥j. of syrup. As to the lime phosphate, which was more indefinite owing to the greater difficulty of separating it from the sugar, his determinations indicated as from .58 gr. to 2.20 grs. per fluid ℥j. of syrup. The original syrup was at that time understood to contain 1 gr. of phosphate of iron, and 2½ grs. of phosphate of lime in each fluid ℥j. But it was found that ½ gr. of phosphate of iron, and 2 grs. of phosphate of lime were more correct figures. Again, I find in the 1890 edition of 'Squire's Companion,' that in nine commercial samples recently tested, the quantity of phosphate of iron varied from .19 gr. to .66 gr. and lime phosphate from .5 gr. to 1.6 gr. per fluid ℥j. of syrup.

Since 1876 there has been great progress made in the process for the manufacture of this, as also Easton's Syrup. The old process of precipitating the phosphates, where it was impossible to prevent the

iron largely changing to the ferric state, has now almost become obsolete.

Considering the fact that I have never done any volumetric determinations, I was obliged to adopt the simpler, though not so exact process of precipitation, drying, igniting in a crucible, and weighing the precipitate. I assayed the iron and lime in separate portions of syrup, diluted well with H_2O . For iron thus:—

To one portion of diluted syrup, I added H_2O_2 to per-oxidise the iron. I then added strong solution of acetate of ammonia. The iron was precipitated as $Fe_3P_2O_8$ (ferric phosphate). It was then collected, washed, dried, and ignited in a crucible, and weighed, and the weight calculated to ferrous phosphate.

For lime: To another portion of diluted syrup I applied heat, and then added NH_4HO , till a slight precipitate was formed. I then added oxalic acid till the precipitate was re-dissolved, with formation of a small quantity of oxalate of lime. Excess of oxalate of ammonia was added next. Oxalate of lime was precipitated, and iron remained in solution. This precipitate was then collected on a filter, thoroughly washed with hot water, dried, ignited in a crucible at a low red heat; $CaCO_3$ was formed, and CO evolved thus:— $CaC_2O_4 = CaCO_3 + CO$.

After ignition, and to prevent further volatilisation, the residue in the crucible was drenched with ammon carbonate, and when cold weighed as $CaCO_3$, from which the $Ca_3P_2O_8$ was calculated.

I wrought on four samples, with this result: that as nearly as I could approximate by this method, three samples out of the four were pretty much alike for quality. I shall number them respectively:—

	Sp. Gr.	Pres. of HCL	Quantity of $Fe_3P_2O_8$	Quantity of $Ca_3P_2O_8$
No. 1.	1.295	some	45 gr.	84 gr.
No. 2.	1.304	none	60 gr.	87 gr.
No. 3.	1.304	none	52 gr.	90 gr.
No. 4.	1.322	none	20 gr.	none

In each fluid 3j. of syrup.

Mr. Blair then gave an instructive paper on "Hospital Surgery," explaining the merits of aseptic and antiseptic treatment; the former method, he said, coming into greater use at present. Mr. Blair showed an ingenious miniature model of a steriliser; it was a jacketed tin, the inner cylinder being perforated round the top. Water was placed between the cylinders, the inner one containing wool, gauze, or whatever was to be sterilised, and the whole submitted to a definite temperature for a certain length of time. Samples of different gauzes, ligatures, drainage tubes, and various salts used for dressings were exhibited.

In discussing the papers, Mr. Watson was thanked for bringing forward a subject of much interest to the trade. It was pointed out that calcining the oxalate of lime would probably leave it as oxide, but his determinations showed that there was great need for an official standard for the syrup.

Mr. Blair's contribution was well discussed, and hearty votes of thanks were accorded to both gentlemen.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE PHARMACY ACTS.

ACTION AGAINST A MEDICAL BOTANIST.

At Oldham County Court, on Thursday, December 13, before Judge Jones, an action was brought against W. Schofield, medical botanist, Ashton Road, Oldham, by the Pharmaceutical Society for having sold poison, he not being a properly qualified person under the Pharmacy Acts.

Mr. Grey, barrister, stated that on August 27 and September 1, Arthur Foulds called at defendant's shop and purchased on each occasion a bottle of cough mixture, for which he paid 7d. The contents were analysed by Mr. Eastes, analyst, and the mixture was found to contain a quantity of opium. Evidence of these facts having been given, defendant said he had been an herbalist for thirty years, and had always guarded against selling scheduled poisons. He denied having committed the offence.

His Honour said that this case was an action brought under the Pharmacy Act, which was passed for the protection of the public, so that no unqualified person should be allowed to sell what the Act stated were poisons. In this case it had been proved that the defendant had sold a mixture containing opium. That being so, the defendant had offended under the Act on two occasions. It was the duty of the Pharmaceutical Society, under the provisions of this Act, to send persons round to ascertain whether people selling poisons were qualified, and if not it was the duty of the Society to enforce the Act. The defendant must pay the full penalty of five pounds in each case, together with the costs.

ACTION AGAINST A GROCER.

At the Abergavenny County Court, on Monday, December 10, before Judge Owen, S. O. Pegler, grocer, Abergavenny, was sued by the Pharmaceutical Society for having sold poison, he not being a properly qualified person under the Pharmacy Acts. Mr. R. E. L. Vaughan Williams, barrister, appeared for the Society.

George Pitt Pidsley stated that, on October 21, he went to defendant's shop and purchased some groceries, after which he asked for a bottle of Fellow's Syrup. Defendant said he did not keep it, but, when requested, sent out for a bottle, and it was included in the bill for the groceries, which was duly receipted by defendant.

Mr. F. Gardner, solicitor, urged in defence that defendant was in the same position as the keeper of a refreshment room, who had no licence to sell beer, but could send out for it for his customers if he made no profit on the transaction. He further urged that the bottle was obtained by a trick, but the Judge remarked that people who broke the law could not be caught sometimes without tricks.

His Honour then said this was an action by the Pharmaceutical Society against a grocer, claiming (under information) a penalty of five pounds for (he being a person not a pharmaceutical chemist or chemist and druggist) selling a compound which was known to be poisonous and containing a large amount of strychnine. The man (Pidsley) on behalf of the Pharmaceutical Society, went in and asked for a bottle of the poisonous stuff called "Fellow's Syrup," and was told they did not keep it, but he was told if he called again, later in the day, it would be got for him. He ordered the syrup, and also some other small things, and when he called again, Mr. Pegler put the things up and gave him a bill, headed "Bought of S. O. Pegler." The

bill included a charge of 3s. 3d. for the syrup. Now it was said that Pegler did not sell. It might be a hard case, but the Act of Parliament was a wise one; it prevents people buying poisonous medicines, which many "patent" medicines were, containing a great deal of poison, and exceedingly dangerous to life. If he held that this was not a sale, he did not know when he could enforce an Act of Parliament. It was said it was a case from which defendant derived no profit, but yet he sold the things, as was shown by the bill. He must give judgment for the claim for five pounds and costs.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

LAUDANUM DEFICIENT IN ALCOHOL.

At the Keighley Police Court on December 7, before Alderman John Brigg and other magistrates, Arthur Noble Kershaw, chemist and druggist, Corn Mill Bridge, was summoned by Arthur Randerson, the local inspector under the Food and Drug Acts, for selling laudanum not of the substance and quality demanded by the purchaser. Mr. W. A. Robinson appeared for the defendant. Mr. Randerson stated that on November 1 he bought a quantity of drugs from Mr. Kershaw for the purpose of analysis, samples of which were sent to Mr. Allen, county analyst, of Sheffield, and all were found to be correct except the laudanum, which contained only one-half of the alcohol which would have been present had the laudanum been prepared according to the directions of the British Pharmacopœia. It appeared that Mr. Kershaw had prepared a gallon of laudanum at a time and kept it in a gallon jar. It was sold out in very small quantities, and by the constant removal of the cork and the heat of the shop some of the alcohol had apparently evaporated, but the medicinal part of the drug was there in proper quantity. The Bench thought that the offence was due to a little want of care, and only imposed a nominal penalty of 5s. and costs.—*Bradford Observer*.

ADULTERATED OLIVE OIL.

At the Worship Street Police Court, on December 8, Messrs. Walton, Hassell and Port, oilmen, etc., possessing shops in various parts of London, were summoned by the Vestry of St. Leonard, Shoreditch, for having sold in two instances at their shops in St. John's Road, Hoxton, and Kingsland Road, a certain drug—i.e., olive oil—which was not of the nature, substance, and quality demanded. Mr. Robinson, LL.D., vestry clerk, prosecuted; and a solicitor whose name was not given defended. The purchases at the respective shops were proved by a sanitary inspector and his agent employed by the vestry, and the analyst's certificate handed in showed that the article sold in response to a request for "olive oil" was adulterated with vegetable oils to the extent of 50 per cent. Dr. Bryett, medical officer of Shoreditch parish, was also called by the prosecution to show that as a "drug" olive oil was entered in the British Pharmacopœia, and that the substitution of vegetable oils would be wholly opposed to medical intention. The witness was cross-examined as to whether the vegetable oils referred to might not be nut oil. He could not say, but was positive nut oil of any character would not be a permissible substitute for olive oil. It being suggested that the adulterating article was cotton-seed oil, the defence denied it. The article known as salad oil should be olive oil. The defence suggested that the article sold was what was commonly sold as salad oil, but admitted that, olive oil having been asked for, there was no answer to the charge. To prove that nothing injurious had been sold to the public, as the article in question was the ordinary commercial oil, Mr. Henry Joseph Hassell,

one of the defendants, was called. He said the firm had seventy shops in London, with a manager for each. The article "nut" oil was perfectly pure, and cost £38 to £40 per ton. He invoiced it from the firm's warehouse to the shop managers as "salad" oil. That was done because the public asked for salad oil, and "olive" oil was an unknown article—"caviare to the multitude." Cross-examined as to why, if nut oil was a pure article, it contained 50 per cent. of olive oil; the witness said the statement was untrue, and the analysis incorrect; there was no olive oil at all in the article. He was aware that the Italian Chamber of Commerce had taken up the matter and complained of the substitution of other oils for olive oil as affecting the export. He denied that the article was cotton-seed oil, but admitted that cotton-seed oil was largely used, and was one of the "foreign fats" frequently worked up into butter. After a lengthy hearing, Messrs. Walton and Co. were ordered to pay £10 fine in respect of the first summons, and £5 fine in respect of the second.—*Times*.

WHITE WAX OR PARAFFIN WAX?

On Thursday, December 13, at the Edmonton Petty Sessions, before a full bench of justices, Stephen Bately, chemist and druggist, of 682, High Road, Tottenham, was fined £1 and £2 12s. costs for selling as white wax an article adulterated with 85 per cent. of paraffin. Mr. Beale, solicitor, appeared to prosecute, and Mr. Avery defended. From the evidence it appeared that on November 5 the inspector of the Middlesex County Council purchased at the defendant's shop sixpenny-worth of white wax, which on analysis was proved to contain 85 per cent. of paraffin. It was stated that white wax was used as a medicine in the making up of pills, and should be pure bleached beeswax. When pure it cost about 3s. a pound, whereas paraffin-wax could be purchased at 8d. For the defence it was contended that the wax was not sold as pure.—*Daily Telegraph*.

POISONING CASES AND INQUESTS.

POISONING BY LAUDANUM.

Thomas Grove, aged 45, died at Wollescote on Saturday, November 24, from the effects of laudanum, self-administered. Verdict: "Suicide whilst in a state of temporary insanity."—*Worcester Journal*.

AN OVERDOSE OF NARCOTICS.

James Swanson Cobb, aged 73, a retired surgeon dentist, suffered from sciatica and gout, and was in the habit of relieving pain and procuring sleep by taking chloral hydrate and morphine lozenges. On Tuesday, December 11, he was found unconscious and suffering from symptoms of narcotic poison. Death ensued on the Wednesday morning, and an autopsy clearly showed it to be due to narcotic poisoning. Verdict: "Death by misadventure."—*Morning Advertiser*.

POISONING BY OXALIC ACID.

Solomon Hills, aged 55, died at Taunton on Saturday, December 8, from the effects of oxalic acid, self-administered. Verdict: "Death by taking oxalic acid during temporary insanity."—*Somerset Herald*.

POISONING BY LAUDANUM.

John Emmerson, aged 37, was found dead in bed on Friday morning, December 14, from the effects of laudanum. Verdict: "Temporary insanity."—*Times*.

POISONING BY CARBOLIC ACID.

Joseph Stananought, aged 46, died on the way to the Charing Cross Hospital on Friday, December 14, from the effects of carbollic acid, self-administered. Verdict: "Suicide while of unsound mind."—*Times*.

Reviews and Notices of Books.

THE PRACTICE OF PHARMACY. By JOSEPH P. REMINGTON, Ph.M., F.C.S. Third Edition. Pp. i.-xxviii., 1 to 1448, with over 600 Illustrations. Price \$6.00. (Philadelphia and London: J. B. Lippincott and Co.)

The sections of this work devoted to the consideration of pharmaceutical operations are practically identical with the same sections of the second edition. They contain a mass of valuable information, and furnish the pharmacist with an extremely useful account of the principal forms of apparatus employed in the various operations, and the manner in which they are used. Both the pharmacist and the student of pharmacy may study with advantage the chapters devoted to filtration, distillation, percolation, etc. They will be found, in the main, to be fairly well up to date, although occasionally useful adjuncts to the dispensing counter are missed. Thus, under the name "konseals" a form of the Morstadt cachet apparatus is described, but the very useful little graduated glass tube with vulcanite plunger for measuring (instead of weighing) powders has been omitted. Considering that the work is apparently designed principally for retail pharmacists, it is to be regretted that neither amongst the stills or presses described is one really suitable for a laboratory in which space is limited.

This objection cannot be urged against the chapter on percolation, which is eminently practical. In fact, it is just in the carrying out of pharmaceutical operations that the author is evidently most at home; in his definitions he is not quite so happy. Evaporation cannot surely be defined as the separation of a volatile liquid from one which is less volatile (def. 1), and distillation does not necessarily involve the separation of two liquids (def. 2). Nor are the two following definitions (3 and 4) as precise as they might and should be. The manufacture of granulated effervescent salts has increased in this country, at least, enormously, and it is quite practical for the retail pharmacist to make the majority of them economically, in small quantities as required. But probably neither retail or wholesale druggists would attempt to mix the dry powders with tartaric acid, sodium bicarbonate, and alcohol, press the pasty mass through a sieve, and dry the granules.

The glossary is a new feature in this edition of 'The Practice of Pharmacy,' which will undoubtedly be of much service to a perplexed pharmacist, although to explain "sal microcosmicum" by quoting as a synonym "salts of urine," is surely "*ignotum per ignotius*."

In Part iv. the Chapters xlix. to lxi. include the organic substances employed in pharmacy, classified under the following headings:—"The Cellulose Group;" "Amylaceous and Mucilaginous Principles;" "Sugars and Saccharine Substances, and Derivatives of Sugars;" "Aldehyde: its Derivatives and Preparations;" "Products of the Action of Ferments upon Acid Saccharine Fruits;" "Volatile Oils;" "Official Drugs and Products containing Volatile Oil with Soft Resin;" "Resins, Oleoresins, Gum Resins and Balsams;" "Fixed Oils, Fats and Soaps;" "Drugs con-

taining Glucosides, &c.;" "Drugs containing Saponinoid Principles;" "Drugs containing Cathartic Principles;" "Drugs containing Astringent Principles;" and "Alkaloids." These are followed by a condensed chart of vegetable official drugs, somewhat after the manner of 'Squire's Companion to the Pharmacopoeia,' and then by a chapter on products from animal substances. It is obvious that this method of classification is of more value to the student of pure pharmacy and of medicine than it would be to the student of pharmacognosy or materia medica. The line seems to be carefully drawn so as to exclude varieties or qualities of drugs, only the official description of the drug being given, and the names of its principal constituents; besides its medicinal properties and doses, and the official preparations in full. A long list of questions is given at the end of each chapter after the fashion of 'Attfield's Chemistry.'

A good deal of space is devoted to a list of the non-official drugs or preparations under each chapter, the name, botanical source, and dose of each being given. These would doubtless prove very useful to the student, when in business, for reference, but he could hardly be expected to remember them all. Indeed, this part of the work seems more properly to come under materia medica. If, in a future edition, the space occupied by these non-official drugs could be devoted to giving a fuller account of the conditions under which the active principles exist in each drug, and the action of solvents upon them in the natural state, it would probably be more useful knowledge to the student of pharmacy.

The chapter on volatile oils is scarcely up to date, the known constituents of the more important volatile oils of lemon, bergamot, lavender, cajuput, etc., not being mentioned. The chapters on fixed oils, glucosides, and alkaloids would also be improved by a little more attention in bringing them up to date. The extent of ground covered in the work is, however, so enormous that a little deficiency in the parts which more strictly belong to materia medica may be left out of consideration on account of the great value of the parts that relate to pure pharmacy and dispensing. Like the 'United States Dispensatory,' Remington's 'Pharmacy' is a book for reference, as well as for use in the class, and will be kept on the shelves as a friend by the student long after he has passed all his examinations.

The volume contains so much information that English pharmacists will find it an invaluable addition to the shop library, whilst to pharmaceutical students it can be strongly recommended as treating of pharmaceutical processes and pharmaceutical apparatus more thoroughly than the majority of other similar works.

Books, etc., received.

STRANGER'S GUIDE TO SAN REMO. By ALEX. OSTROWICZ, M.D. Pp. 121, with eight views and a map. Munich: A. Bruckmann. From Mr. F. B. Squire.
A PHYSIOLOGICAL DISCOVERY IN CONNECTION WITH THE CIRCULATION OF THE BLOOD. By F. D. FISHER. Pp. 7. Grantham: W. Clark. From the Author.

Obituary.

FRIEDRICH AUGUST FLÜCKIGER.

The death on December 11, at Berne, at the age of 66, of Dr. Friedrich August Flückiger—an Emeritus Professor of the University of Strasburg, and one of the honorary members of the Society—is an event which will produce throughout the entire world, in pharmaceutical circles where science is valued, the deepest regret and the greatest sympathy. Since there is no doubt that at a subsequent period a complete biography of this prominent authority and investigator will be published in some German journal, only a short sketch of his life and partial recognition of his scientific achievements will be attempted on the present occasion.

F. A. Flückiger was born on May 15, 1828, at Langenthal, a small village in the Canton of Berne. The son of a merchant, he received an education partly in his native country, partly in Berlin, at a commercial institute very celebrated at that time, and he was intended for a pharmaceutical career. He passed through the whole pharmaceutical curriculum, having been placed as a pupil, in the year 1847, with an apotheker in Solothurn. He was then engaged for a short time in France, Germany, and Switzerland, as an assistant, concluding his pharmaceutical studies in the year 1851-52 at Heidelberg, where, in the position of chemical assistant to Professor Delfs, he obtained the degree of Doctor of Philosophy by means of a dissertation upon the fluorine compounds of antimony, which was distinguished by the care and precision of the work.

In the following year he worked in Paris with the well-known chemist, Wurtz, and after adding to his knowledge in London, began, in 1853, his career as a practical apotheker and part-proprietor of a pharmacy in the small town of Burgdorf, near Berne. There he prosecuted his occupation until 1860, together with incidental scientific and literary studies, and then took the position of manager of the State pharmacy in the town of Berne, to which place he transferred his residence. He occupied this position—with which several other officials, (for instance, the members of the Sanitary College and the Pharmaceutical Examiners) were connected—and at the same time that of forensic chemist to the Canton of Berne until 1873.

A year after taking this new position in Berne he began to give public lectures on pharmaceutical subjects, especially pharmacognosy, as tutor at the University of Berne, and in 1870 he was elected extraordinary professor in recognition of his academic activity.

In 1873 he accepted the very complimentary invitation to take the professorship of pharmacy and directorship of the pharmaceutical institute at the newly-established University of Strasburg, where he continued for nearly twenty years as an ornament of its mathematical and natural science faculty, and where his death is now lamented as a great loss. With the greatest success and indefatigable loyalty he continued his

labours as teacher, investigator, and author until 1892, when, at the age of sixty-four, he resigned, with the object of spending the evening of his life in the undisturbed quiet of literary work in the chief town of his native canton, after having devoted the best years of his life to the academic representation and promotion of his calling.

At the invitation of a friend he visited New York during this year, returning from there with many pleasant and instructive recollections at the commencement of October. Very soon afterwards indications of a complaint, which had no doubt long been latent, manifested themselves and in a very short time terminated his life.

Flückiger's scientific achievements and merits cannot of course be sufficiently acknowledged in a short sketch of his life, but only mentioned in a cursory manner. Indefatigable industry in scientific investigations was a characteristic of his work, assisted as it was by remarkable powers of memory, and an astonishing acquaintance with all departments of literature relating to pharmaceutical and natural science. This is the key to an almost astonishing many-sidedness which enabled him without the least danger of superficiality to carry out important work in all departments of his calling, and in almost equal degree to cultivate pharmacognosy, pharmaceutical chemistry, and the history of chemistry and of drugs, with such success that, independently of his larger writings, upwards of 300 memoirs have been contributed by him to pharmaceutical literature on those subjects.

For a powerful stimulus in promoting his scientific calling he was, no doubt, indebted to his intimate participation in the construction of the first *Pharmacopœa Helvetica* while residing at Burgdorf. This he had to carry out as President of the Swiss Apotheker-Verein from 1857 to 1866. He was also engaged as chief editor of the second edition of the *Pharmacopœa Helvetica*, 1872. The preliminary work, experiments, observations, and literary studies necessary for this purpose may be regarded as the basis of his '*Lehrbuch der Pharmakognosie des Pflanzenreiches*,' carried out in Berne, the first edition of which was published in 1867 by Gaertner, at Berlin, and acquired for him at once a universal reputation and well-earned recognition. That work, the second and third editions of which appeared in 1883 and 1891, founded a new epoch in the science and study of pharmacognosy, one of the most eminent representatives of which Flückiger was generally acknowledged to be.

Of still greater interest to all English-speaking pharmacists was '*Pharmacographia*,' published in 1875 conjointly with Daniel Hanbury. In conjunction with that distinguished representative of English pharmacy, Flückiger continued for many years a joint work, which led to the production of a book which is not only generally valued throughout England and America, but was also of importance in regard to all the subsequent publications by Flückiger upon the subject of pharmacognosy. After the death of Hanbury in 1878, the second edition, revised by Flückiger, was published by Macmillan. During the

same year appeared the first edition of his 'Pharmaceutical Chemistry,' which treated in a masterly monographic manner of the more important pharmaceutical chemicals, and contained an abundance of original observations by himself. The second edition of this work was published in 1888. As supplementary to his 'Lehrbuch der Pharmakognosie,' Flückiger published in 1873 the "Grundlagen der pharmaceutischen Waarenkunde," of which a second edition appeared in which Professor Tschirch assisted, and where the anatomical botanical relations indispensable to the study of pharmacognosy were treated of. Since the relatively large extent of Flückiger's 'Pharmakognosie' rendered that work less suitable for the use of students, he reproduced its quintessence in a more compact form as a small handbook, the "Grundriss der Pharmakognosie," which was intended for use by students attending lectures. This book, which soon became popular throughout German-speaking countries, was published in 1884, and in 1894 a second edition appeared, not long before the death of the author.

One of the last literary productions of this pharmaceutical author was the work entitled, "Reactions," published in 1892, in which the chief chemical reactions of the more important organic substances used in medicine and pharmacy are described, and an inconceivably large number of original observations by the author are recorded. This was in part a fruit of his labours as member of the Pharmacopœia Committee of the German Empire. Passing over Flückiger's historical writings, it may be mentioned that he proved himself a master of style in numerous essays, accounts of travels, and other literary productions. His way of writing made all his productions in the highest degree attractive.

In concluding this brief notice, it may be said that Flückiger gave evidence of a combination of unusual natural faculties, with a great store of carefully acquired knowledge and untiring industry, giving rise to unique literary productions. No one can be compared with him or anyone placed before him as having contributed so largely to scientific pharmacy. Switzerland, his native land, will long continue to include him among her most eminent scientific men. Honour to his memory!

EDWARD SCHAEER.

Notice has also been received of the death of the following:—

On November 10, Frederick Allwork, Chemist and Druggist, London. (Aged 69.)

On November 27, John Gill Blackburn, Chemist and Druggist, Leeds. (Aged 57.)

On November 28, John Roddam Sayer, Chemist and Druggist, Sunderland. (Aged 66.)

On November 28, Robert Gadd, Chemist and Druggist, Vauxhall. (Aged 50.) Mr. Gadd's membership with the Society dated from 1869.

On November 30, W. F. E. Horrell, Pharmaceutical Chemist, Exeter. (Aged 25.) Mr. Horrell was only elected a member of the Society in June last, having passed his Major examination in October, 1893.

On November 30, Alfred Richardson, Chemist and Druggist, Manchester. (Aged 42.)

On December 5, Thomas Womack, Chemist and Druggist, Stratford-on-Avon. (Aged 47.)

On December 9, James Stewart, Chemist and Druggist, London. (Aged 61.)

On December 10, Thomas B. Spence, Chemist and Druggist, Edinburgh. (Aged 76.)

On December 10, Edmund Staples, Chemist and Druggist, Wilton. (Aged 83.)

On December 11, Thomas H. Teear, Chemist and Druggist, Leicester.

On December 14, John B. Robson, Chemist and Druggist, Filey. (Aged 69.)

Notes and Queries.

NEW PHOTOGRAPHIC REDUCER.

[786.] A correspondent of the *Amateur Photographer* recommends a new combination for reducing over-exposed prints. A cold saturated solution of sodium hyposulphite (about 20 per cent.) is diluted with four times its volume of water. To 100 C.c. of this is added 1 C.c. of a 10 per cent. solution of uranium nitrate. The prints are immersed in the solution for a few minutes until sufficiently reduced, then washed, and fixed with the following solution:—lead nitrate, 10 parts (? grammes) and sodium hyposulphite, 200 parts, are dissolved in distilled water, 1000, whilst just before using, 50 C.c. of a 1 per cent. of gold chloride solution is added (*Nouveaux Remèdes*).

SOLUBILITY OF COCAINE HYDROCHLORATE IN VASELIN.

[654.] In reference to the dispensing query on page 371, several correspondents recommend W. F. G. to rub up or dissolve the hydrochlorate of cocaine in a minimum quantity of water, and then thoroughly incorporate with the vaselin. Such an ointment is probably more efficacious than a solution of the alkaloid itself in a fatty excipient, but in either case the addition of oleic acid would be undesirable, remarks one correspondent. Another suggests that a better preparation would be made by dissolving the alkaloid itself in oleic acid and mixing this with the vaselin, though this course would not be justifiable when the hydrochlorate of the alkaloid is prescribed. It may be pointed out, however, that the evident desire of W. F. G. was to ascertain how the salt might be incorporated in the ointment in a state of solution. It is slightly soluble in melted vaselin, but only to the extent of about half what is ordered in the prescription. The alkaloid itself is more soluble, but its use would not be justified, and whether the hydrochlorate should be partially dissolved or not would depend to some extent on what was known regarding the prescriber's intentions.

Patent Office Business.

APPLICATIONS FOR PATENTS.

No. 21,589.—Thomas Tildesley, 1, Fumival Street, Holborn.—Improvements relating to pills. November 9, 1894.

No. 22,332.—Thomas Jardine, 53, Chancery Lane, W.C.—An emulsion or specific for human use possessing nourishing and curative properties.—November 19, 1894.

Correspondence.

BEESWAX, BLEACHED AND UNBLEACHED.

Sir,—The contamination of English beeswax with paraffin and similar bodies, such as ozokerit, owing to the artificial "comb foundations" to assist bees in the more rapid production of honey, is becoming so general that it seems necessary to call the attention of pharmacists, and through them of producers of beeswax, to the subject. Although comparatively little of the wax employed for general economic purposes is of British production, the bulk of that employed in pharmacy is collected in this country. The presence in beeswax of paraffin, ozokerit and other bodies unacted upon by sulphuric acid, may be readily proved by the application of the United States Pharmacopœia test for that purpose, coupled with the neutralisation and saponification equivalents. Of three samples of English beeswax recently obtained from districts wide apart only one was found to be free from paraffin, while samples of foreign beeswax, which reached the port of London from Jamaica and Madagascar, as well also as East Indian bleached wax, produced undoubtedly without any artificial assistance to the bees, were found quite free from this contamination. The melting point of various waxes may vary within slight limits of that prescribed by the British Pharmacopœia, the other tests being readily complied with, but a wax containing paraffin and ozokerit of suitable melting points may also answer the same requirements. It seems desirable, therefore, to impress on bee-keepers the necessity of using pure beeswax "comb foundations" only, and on pharmacists the advisability of carrying the testing of beeswax somewhat further than that prescribed in the British Pharmacopœia.

Southwark, London.

JOHN C. MNEY.

EUCALYPTUS OIL.

Sir,—After the Evening Meeting of the Pharmaceutical Society, on December 12, I elicited from Mr. Payne, of Adelaide, that competent medical authorities in Australia had been supplied by him with pure constituents of eucalyptus oil, solid and liquid, and that the pharmacological and therapeutical action of the substances had been determined. He promised to urge the publication of the results through the usual medical channels.

JOHN ATTFIELD.

THE APPOINTMENT OF EXAMINERS.

Sir,—Regret has often been expressed by those of us who wish well to our Society at the lack of interest that is taken in the election of Councillors. The recent "departure in inaugurating a new system of examination" would seem just such a topic as would have evoked a good deal of interest in the election, had it been fairly put before the electors. Where organic changes of this character are made without a chance being given to the members of the Society to express an opinion upon the matter, one ceases to wonder at the apathy of many as to who shall represent us. Personally, I yield to none in my esteem for Professor Green, and I am therefore very sorry that our Council has placed him in such an invidious position. The examination of candidates for qualification to practise pharmacy is the most important function delegated to the Society by Parliament. Such being the case it is of paramount importance that the examination be conducted in such a manner as to be

altogether above suspicion, even in the eyes of those who are but too ready to find fault with anything the Society may do. There is an impression abroad among candidates from other schools of pharmacy that in some way students from Bloomsbury Square are favoured—an unfounded impression I verily believe—but, nevertheless, it exists, and should have been taken into account. Much may be said, and was said, at the Council meeting of the advantages of allowing a professor some share in the examination of his own pupils. But very little was said of the manifest inadvisability of allowing the professor of one school to share in the examination of students from other schools—schools, moreover, considering themselves rivals of the institution to which such examining professor is attached. At a time when we had thought there were signs of consolidation among the members of our craft, a measure that will tend to alienate from the Society the large number of men entering business otherwise than through the School of Pharmacy at Bloomsbury Square is much to be deplored. Especially so, after the determined opposition which the proprietor of another school of pharmacy justly encountered a few years since in his attempt to obtain a seat upon the Council. Under the altered circumstances of the case he may calculate upon a much greater chance of success in any future candidature. From a sense of fair play (I trust not a mistaken one) Mr. Wills may count upon my vote, if I still retain one, in future election if he should seek it. The Vice-President ventured the hope that the "impression would not get abroad that they were appointing interested men as examiners." Why the fear of such an impression unless the Vice-President, who seconded the motion, were conscious of a course of action being entered upon such as would tend to spread an impression of the kind?

Bristol.

E. F. YOUNG, M.P.S.

* * Our correspondent is mistaken in thinking that the appointment of professorial examiners is an "organic change," or that it has not been fairly put before the electors, as it was one of the subjects under discussion at the latest alteration of the bye-laws (see reports in *Pharmaceutical Journal*). In reference to the hope (not the fear) expressed by the Vice-President, we may suggest that it was instigated by the belief that any such impression as that referred to would be unfounded, and we fail to recognise the propriety of regulating the examinations to satisfy unfounded impressions.—[Ed. *Pharm. Journ.*]

Diary of the Week.

THURSDAY, DECEMBER 27.

Royal Institution of Great Britain, at 3 p.m.

"The Manufacture of an Electric Current" (Lecture I.), by Professor J. A. Fleming.
Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.

"The Present Aspects of Pharmacy," by A. Boyd.

FRIDAY, DECEMBER 28.

Aberdeen Chemists' and Druggists' Assistants' and Apprentices' Association, at 9.30 p.m.
Social Meeting.

SATURDAY, DECEMBER 29.

Royal Institution of Great Britain, at 3 p.m.

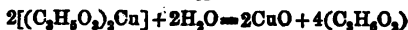
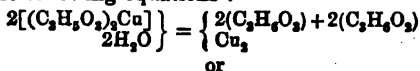
"The Electric Current working as a Chemist" (Lecture II.), by Professor J. A. Fleming.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Black, Cracknell, Elborne, Hill, Holloway, Long, Mathews, Parker, Rideal, Schner.

"THE MONTH."

Propionic and Lactic Acids.

F. Gaud has obtained lactic acid and ethylideno-lactic acid by heating propionic acid with Fehling's solution for a prolonged period, at 240° C. The reaction is probably represented by one of the following equations:—



He also finds that propionate of copper, heated at 180°-200° with an excess of water, for fifty or sixty hours, is decomposed into metallic copper, cuprous oxide, together with propionic and lactic acids (*Comp. rend.*, cxix., 905).

Influence of Arsenic Acid on Algae.

R. Bouilliac has proved that *Stichococcus bacillaris*, Nægeli, and other Algae will live and exercise their reproductive power in nutritive solutions containing arsenic acid, and even assimilate the acid. Further, the phosphates in nutrient solutions may be replaced by arseniates, and the Algae will yet continue to thrive (*Comp. rend.*, cxix., 929).

Ozone as a Disinfectant.

Ozone is shown by Mailfert to be soluble in water to the extent of 39.4 Mgm. per litre at 0°C., 25.9 Mgm. at 15°, 13.9 Mgm. at 27°, and 0.6 Mgm. at 55°. He suggests therefore that this property of ozone may be utilised to sterilise water in certain circumstances, and that ozonised water may serve as an antiseptic and disinfectant in hospitals (*Comp. rend.*, cxix., 951).

Allotropic Mercury Sulphides.

W. Spring describes a form of black mercury sulphide obtained by subliming the ordinary black sulphide in an atmosphere of nitrogen or carbon dioxide. Its density is 8.0395 at 17°C., that of the ordinary black sulphide being 7.6242, and that of the red, 8.1587. M. Spring points out that the lighter of two allotropic modifications of a body may usually be converted into the denser form by compression, although sometimes the change is possible only above a certain "critical" temperature. To convert the ordinary sulphide into the red variety by this method would require the at present unobtainable pressure of 35,000 atmospheres, but the new variety, which has a density lying between the others, can be so converted by a pressure of 2500 atmospheres. It is possible that these observations may have some practical bearing on the manufacture of vermilion (*Bulletin de l'Académie Royale des Sciences, etc., de Belgique* [3] xxviii., pp. 238 to 257).

Purification of Alcohols, etc.

E. Maumené purifies alcohol, sugars, and other organic bodies by the action of potassium permanganate. If a litre of impure alcohol be agitated with 2 C.c. or 3 C.c. of aqueous permanganate solution, oxides of manganese are precipitated, the impurities are oxidised, and any bad taste disappears, and after standing awhile a clear liquid may be decanted. The same process is recommended for purifying red and white wines, which are said to lose but little of their colour or bouquet, as well as for refining sugars and improving potable waters (*Comp. rend.*, cxix., 1014).

Reduction of Alumina.

H. Moissan has investigated the reduction of alumina in the electric furnace, and finds that when the oxide is in the liquid state it is not reduced by carbon, but when the vapours of both alumina and carbon are heated to an exceedingly elevated temperature, reduction of the oxide to metallic aluminium takes place (*Comp. rend.*, cxix., 935).

Atomic weight of Bismuth.

The number 210, obtained by Dumas in 1859, and generally accepted as the atomic weight of bismuth, has been disputed by Marignac, who in 1883 gave the atomic weight as 208.16, and, more recently, by Classen, who obtained 208.9. R. Schneider gives as the result of a re-determination of this factor, 208.05, a number confirming the determination which he published forty-three years ago, and closely agreeing with that of Marignac (*Journal für praktische Chemie*, N.S., I, No. 9).

Synthetic Guaiacol.

Ordinary guaiacol from beechwood and other creasotes is frequently very impure, and sometimes contains less than 50 per cent of active substance. Béhal and Choay in 1893 succeeded in making guaiacol synthetically in a nearly pure condition (see *Pharm. Journ.* [3], xxiv., 730), and since that date, by recrystallisation, an absolutely pure guaiacol has been prepared commercially. The pure synthetic product is likely to be used in preference to the natural preparation as a prophylactic in cases of tuberculosis. Professor Marfori has recently made an exhaustive comparison between the crystallised synthetic product and the purified guaiacol from beechwood. He finds them to be chemically and therapeutically identical, and advocates the use of the synthetic product in preference to the commercial variety from creasote, since it is of guaranteed purity (*Ann. di Chim. e. Pharm.* 1894, 284).

Myrosin.

Guignard has already shown that myrosin (or at least a ferment decomposing potassium myronate) occurs not only in *Cruciferae*, but also in *Limnanthaceae*, *Tropaeolaceae*, *Rosaceae*, and *Papayaceae*, and is found in the root, stem, leaf, and seed; the wing of *Lunaria* seed contains it in abundance. The ferment, he finds, is weakened in action at a temperature of about 80° C., and is destroyed at 85° C. Its action is not entirely prevented by 1 per cent. of tannin, 5 per cent. of chloral, or 8 per cent. of borax or alum. On the other hand, its activity appears to be checked by 15 per cent. of salicylic acid (*Journ. de Bot.*, 1894, 418).

Persulphates as Disinfectants.

L. Wacker finds that ammonium persulphate in 1 to 2 per cent. solution has a very powerful disinfecting action, killing cholera and other germs in a few minutes. It has the formula $(NH_4)_2S_2O_8$, and is prepared like the potassium salt, by electrolysis of a solution of ammonium sulphate acidulated with dilute sulphuric acid. The salt formed in this way is purified by cooling in ice a solution saturated at the ordinary temperature. It appears that a solution of this salt has scarcely any action upon the higher animals, and can therefore be used as a preservative for fish or meat. It is also a deodorant, and can be used for removing the objectionable smell from faeces (*Chem. Centr.*, 1894, 873).

Emetics. P. Adam has investigated the behaviour of antimony oxide towards organic acids containing an alcoholic hydroxyl group, and has succeeded in obtaining compounds analogous to tartar emetic with the salts of both lactic and malic acids. His results confirm Jungfleisch's suggestion that the oxide of antimony acts as an acid and not as a basic substance, and that therefore the emetics should be classified as esters, or ethereal salts, of the corresponding compounds from which they are derived. In preparing these new emetics, the author boils a solution of the salt of one of these hydroxy-acids with the oxide of antimony. The free acid usually yields no such product. E. Maumené has partly confirmed these views by careful analysis of tartar emetic and its analogues, and he shows that the formula of these compounds must be of a more complex character than that usually accepted (*Compt. rend.*, cxviii., 1415).

Soldering Aluminium. Professor J. Richards states that the best results in soldering aluminium have been obtained with an alloy of zinc, tin, aluminium, and phosphorus. The solder can be used with the blow-pipe or a soldering iron, a little silver being added in the former case to make it harder and give it a better colour. No flux of any description is required in using it (*Aluminium World and Journ. Am. Chem. Soc.*, xvi., 881).

Arsenic in Phosphates, etc. M. Schlagdenhauffen finds that phosphates and alkaline hypophosphites frequently contain arsenic, although in very small proportion, and he urges therefore that only such preparations should be employed in medicine as yield negative results when tested in Marsh's apparatus (*Bull. com.*, 1894, 466).

Stability of Hydrogen Peroxide. Wolfenstein has observed that hydrogen peroxide is much more stable than is commonly supposed. A solution containing 4.5 per cent. can be evaporated on a sand-bath until the percentage rises to 66.6; the loss is considerable when the strength is over 15 per cent., but is due to vaporisation, not to decomposition. Such evaporation, however, can only be successfully accomplished if the solution be free from every trace of alkali, compounds of heavy metals, and solid bodies of any kind, even if chemically indifferent. By concentrating a solution—by shaking with ether, evaporating the ethereal liquid, and fractionally distilling in a vacuum (68 millimetres) at 70°–80° C.—a product was obtained containing 99.1 per cent. of hydrogen peroxide (*Ber. d. ph. Ges.*, iv., 247).

Alum in Bread. W. D. Bigelow and C. C. Hamilton find that the presence of alum in bread interferes materially with gastric digestion, but the aluminium seems to be precipitated by the alkali of the pancreatic fluid, so that the latter effects a portion of the digestion which should be effected by the pepsin. The influence of aluminium hydroxide is about the same as that of alum, but aluminium phosphate acts quite differently, 10 to 12 per cent. of the albuminoids that are digestible in the presence of alum or aluminium hydroxide being apparently insoluble in the presence of an equivalent amount of the phosphate (*Journ. Am. Chem. Soc.*, xvi., 587).

Pure Ether. H. Thoms finds it impossible to obtain ether that will not restore the colour to fuchsin decolorised by sulphurous acid, and show an alkaline reaction with moistened red litmus paper. He comes to the conclusion that these are properties of chemically pure ether, and his opinion is confirmed by the fact that ether obtained in Pictet's laboratory by freezing behaves in a similar manner. The production of bodies thus formed by the action of air on pure ether, such as acetic acid, acetaldehyde, peroxide of hydrogen, etc., is not prevented by the addition of two per cent. of alcohol (*Ber. d. ph. Ges.*, iv., 239).

Disinfection by Copper Sulphate. H. Vincent claims that copper sulphate is the best disinfectant for faecal matters and the contents of cesspools, satisfactory results being obtained in twenty-four hours with 7 Gm. to 8.5 Gm. of the salt per 1000 C.c. of matter disinfected. For typhoid and cholera dejecta 6 Gm. and 4 Gm. respectively, per 1000 C.c. sufficed, the comma bacillus disappearing in about twelve hours. The greater the degree of fluidity in the matter to be disinfected, the sooner is the result attained, whilst a smaller proportion of disinfectant is required in summer than in winter, other things being equal. The presence of alkalies tends to check the action of both copper sulphate and chlorinated lime. For normal excreta mixed with urine it is recommended to employ 6 Gm. of sulphate per 1000 C.c., to effect disinfection within twenty-four hours; in typhoid cases 5 Gm. per 1000 C.c. should be used; whilst for cholera dejecta 3.5 Gm. per 1000 C.c. will suffice, twelve hours only being required in the last two cases (*Comp. rend.*, cxix., 965).

Pectic Fermentation. G. Bertrand and A. Mallèvre find that pectase (see *Ph. J.* [3], xxiii., 972) alone cannot coagulate pectin, but only effects that transformation in the presence of a soluble salt of calcium, barium, or strontium. The precipitate formed has been generally understood to be pectic acid, but it is now shown to be a pectate of an alkaline earth (*Comp. rend.*, cxix., 1012).

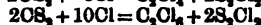
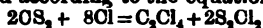
Methylooniine in Coniine. Wolfenstein has examined commercial "pure water-white coniine," and found it to contain another alkaloid which was separated by crystallisation of the tartrate, and proved to be methylooniine. It boiled at 173°–174° C., and possessed a specific rotatory power of +81°–33 (*Ber. d. ph. Ges.*, iv., 242).

Tests for Quinine. Dr. T. G. Wormley has investigated the limits of applicability of some of the tests for quinine. In the thalleioquin test, a saturated aqueous solution of bromine (about 3 per cent. by weight) gave no green coloration with 1–20,000th quinine solution, but when the reagent was diluted to half strength, a well-marked green colour was obtained. When chlorine was used, however, no green coloration could be obtained, even though the strength of the reagent was varied. With stronger solutions of quinine, however, Wormley finds that when an aqueous solution of chlorine is employed, a positive reaction manifests itself through a greater range than when the more sensitive bromine is employed, the result being less readily affected by excess or deficiency of the reagent. With the herapathite test, nice adjustment of the reagents was required to obtain satisfactory results with the residue from a drop of

a 1-1000th quinine solution, if simply moistened with acidified alcohol (30 vols. strong acetic acid to 10 vols. strong alcohol, and 1 vol. 1:10 sulphuric acid), and then with a minute drop of iodine solution (iodine 1 part, alcohol 2 parts, by weight). Fluorescence was well marked in a 1-100,000th solution of quinine acid sulphate (normal) on the addition of a drop of dilute sulphuric acid, though only faint previously. Under certain conditions, however, as with Kerne's fluorescence, a marked fluorescence is indicated in solutions of the alkalioid under a dilution of two million times. Chlorides, bromides, iodides, and their free acids, prevent fluorescence, and Sestini and Campani note that it may be concealed by the presence of phenacetin, which may also cause variations in the thalleioquin test. The bitter taste of the acid sulphate is said to be perceptible in a single drop of a 1-20,000th solution, but not in a 1-50,000th solution (*Am. Journ. Pharm.*, lvi, 561).

Calolum Carbide. The production of acetylene from calcium carbide, a bye-product in the electrolytic reduction of aluminium and other refractory ores, is said in the current number of *Industries and Iron* to be likely to become a factor in gas manufacture. Acetylene has about the same illuminating power as the oil gas now so largely used in enriching coal gas, but the dangerously explosive nature of a mixture of acetylene and air may possibly preclude its use in large quantity as an enricher.

Carbon Chlorides. Professor Victor Meyer describes the production of the compounds C_2Cl_4 and C_2Cl_6 at temperatures as low as 20° to 40° C., during the preparation of carbon tetrachloride by the chlorination of carbon disulphide. It has long been known that carbon tetrachloride is partly decomposed at a red heat with liberation of chlorine and formation of the chlorides C_2Cl_4 and C_2Cl_6 , but it is now evident that the decomposition occurs, more or less, at far lower temperatures. In the preparation of the tetrachloride at the works of Müller and Dubois, near Mannheim, by the above-named process, the product is distilled from the sulphur dichloride, which is produced with it, and is then re-distilled. During the latter operation, an oily liquid, boiling at a higher temperature than the tetrachloride, is obtained, and this has been shown by Victor Meyer to contain the liquid chlorides CCl_4 and C_2Cl_4 , and the solid chloride C_2Cl_6 (perchlor-ethane). Professor Meyer considers that the two latter compounds are produced according to the equations:—



(*Berichte*, 1894, p. 3160).

Bettendorfs Test for Arsenic. C. O. Curtman finds that when stannous chloride is used as a test for arsenic, the utmost limit of reaction, for practical purposes, is reached when 0.03 Mgm. of arsenic is present per 1 C.c. of solution, and that the method in which metallic tin and heat are employed is to be preferred where antimony and bismuth are absent. Both with the U.S.P. solution (without the use of metallic tin), and with that of the German Pharmacopoeia, the greatest intensity of colour, after an hour's reaction, occurred when 1 C.c. of the arsenical solution was mixed with 2.5 C.c. of the reagent. Though metallic tin accelerates and intensifies the reduction of

arsenic, it also reduces bismuth or antimony if present, and distinction between the precipitates might then be difficult. In several instances in the U.S.P., where this test is intended to detect the presence of arsenic as an impurity—as in the case of bismuth and antimony salts—tin-foil has, by an error in transcribing, been directed to be added (*Journ. Am. Chem. Soc.*, xvi, 580).

Guaiacol Phosphite. According to M. Ballard a compound can be prepared containing 92.25 per cent. of guaiacol and 7.75 per cent. of phosphorus. The resulting product is a white crystalline powder, non-caustic, melting at $77^\circ.5$, very soluble in alcohol, ether, or chloroform, but less soluble in water, fatty substances, or benzin, and still less in glycerin. The compound is said to be well tolerated when administered, but its therapeutic action has not yet been sufficiently studied (*Bull. com.*, Nov., 519).

Proteids of the Kidney Bean. T. B. Osborne has identified and obtained in a state of comparative purity from the kidney bean (*Phaseolus vulgaris*) two distinct proteids—"phaseolin" and "phaselin"—which have the properties of globulins. The two globulins are characterised by great solubility in very dilute saline solutions, and by yielding precipitates with acids, which are soluble in sodium chloride solution. Phaseolin probably forms about 20 per cent. of the seed, and is the proteid described by Ritthausen in 1884. Phaselin is much more soluble, and remains in solution after the phaseolin has separated. It is slowly coagulated by heat at temperatures varying with the amount of salts present and the rapidity of heating. Acids precipitate it, and by prolonged dialysis insoluble or albuminate modifications are yielded. Phaselin possesses properties more nearly resembling those of a globulin than of any other recognised class of proteids. In addition to the two globulins an extremely small amount of proteose was found (*Journ. Am. Chem. Soc.*, xvi, 633, 703, and 757).

Proteids of Cotton Seed. Osborne and Voorhees show that the water-soluble matter of cotton seed consists almost wholly of proteose, and does not exceed 0.75 per cent. of the oil-free meal (two per cent. total N.). A salt-soluble globulin, "edestin," occurs to the extent of 15.83 per cent., containing 42.3 per cent. of the total nitrogen. Other proteid matter was alkali-soluble but salt-insoluble (44.3 per cent. total N.), or insoluble both in salt and alkali (11.4 per cent. total N.) (*Journ. Am. Chem. Soc.*, xvi, 778).

Determination of Starch. W. E. Stone compares the methods in use for the determination of starch—including inversion with hydrochloric, nitric, and salicylic acids, and precipitation by barium hydroxide—and finds that they will all yield satisfactory results when dealing with starch alone. Such bodies as the pentosans, however, respond to the same reactions as starch, this being proved conclusively in the case of "xylan," the pentosan most characteristic of feeding stuffs. The application of diastase or malt infusion to the starch-containing material seems to avoid this difficulty, and, though there are minor objections to this method, they are more than compensated by the greater accuracy secured (*Journ. Am. Chem. Soc.*, xvi, 726).

Rubus Villosus. H. Harms has studied the glucosidal principle and the tannin found in the bark of this plant. The former was found to correspond with the "villosin" previously obtained from the bark by Krauss (*Am. Journ. Pharm.*, 1889-90), and is probably one of the saponins. It yielded villosic acid as a decomposition product. Tannin was present in the dried bark to the extent of from 12 to 19 per cent., in different samples. It is described as dark brown in colour, faintly odorous, readily soluble in water or alkaline solutions, sparingly soluble in ether or acetic ether, and insoluble in acetone or benzol (*Am. Journ. Pharm.*, xlii, 580).

Asbestos Filter. A novel and ingenious filter has been presented to the *Société de pharmacie du Sud-Ouest*, and is described in the Society's *Bulletin* for November as free from many of the disadvantages of filters made of paper, flannel, etc. It consists of a covered tinned copper cylinder, below which is fixed an inverted cone of very fine wire gauze, and the whole is supported on an ordinary funnel stand. The liquid to be filtered has a small quantity of powdered asbestos suspended in it, and is then poured into the cylinder. The asbestos forms a filtering layer upon the wire gauze, and the liquid passes through perfectly clear. The wire gauze is afterwards washed with water, and is then ready for further use. The apparatus is said to have been used with advantage to filter syrups, decoctions, infusions, distilled waters, medicated wines, etc., economy being effected both in time and material. It is manufactured in all sizes by the *Comptoir Français des Filtres Asbestos*, 138, Avenue de Paris, plaine St. Denis (Seine).

Origin of Vascular Plants. According to Professor D. H. Campbell, it is generally admitted that the origin of the vascular plants is to be sought among the less specialised Bryophytes, which in turn were derived from algal ancestors. In the evolution of the sporophyte it gradually passed from a condition where its whole substance was devoted to spore formation, to that where this function was more and more subordinated to the vegetative life of the sporophyte. The latter, by the development of special organs—roots and leaves—became free from the gametophyte upon which it had lived as a parasite, the genus *Anthoceros* being the nearest to realising this condition among living Bryophytes. From such a condition several lines of development have probably proceeded, resulting in the different groups of Pteridophytes, which in turn may have independently given rise to seed-bearing plants (*Science Progress*, Dec., 278).

Citrine Ointment. C. H. La Wall directs attention to the extreme importance of carefully regulating the temperature in making citrine ointment. He finds, after a long series of experiments, that lard oil is the best vehicle to employ, and recommends the following process:—Heat the oil to 100° C., and then add the nitric acid without stirring. Then heat again in a vessel capable of holding six times the quantity of the ointment to be made, and until effervescence ceases. To the mixture, cooled to 40° C., the mercuric nitrate is then added in solution, the temperature being gradually allowed to rise until 60° C. is reached. This latter temperature is main-

tained until no more gas is evolved, and the product is then agitated until cold. When prepared in this way, the ointment is in every way satisfactory, and keeps well (*Amer. Journ. Pharm.*, 1894, 925).

Californian Wines. W. H. Krug publishes figures which appear to prove that Californian dry wines are fully equal to the European wines, and that the red wines are in every respect superior to young French clarets. The sweet wines are not plastered, and are said to be preferable to European southern wines containing the same amount of alcohol and extractive (*Journ. Am. Chem. Soc.*, xvi, 597).

New Mercurial Treatment. Dr. Jullien, according to the *Repertoire de Pharmacie*, mixes 2.5 per cent. of calomel with "traumatoin," which consists of a 10 per cent. solution of gutta percha in chloroform, and this mixture he uses as a paint in skin diseases. He applies it to the part affected with a brush. The mercury is rapidly absorbed, as shown by its early presence in the urine and by salivation.

A New Hæmostatic. Fluid extract of shepherd's purse (*Capsella bursa-pastoris*) is recommended as a substitute for *Hydrastis canadensis* as a hæmostatic, in doses of 0.1 to 0.15 gramme thrice daily. The active principle is said to be bursinic acid, which can also be administered as a sodium or iron salt (*Ann. di. Chim. e. Pharm.* 1894, 303).

Toluol in Diphtheria. Löffler's formula for this remedy in its original form has already been given in the *Journal* (ante, p. 435) and is as follows:—Absolute alcohol, 60 C.c.; toluol, 36 C.c.; ferric chloride (solution), 4 C.c. To render its application less painful, however, Löffler adds menthol, the formula then being:—Menthol, 10 Gm.; toluol, *q.s.* to make 36 C.c.; absolute alcohol, 60 C.c.; ferric chloride, 4 C.c. In certain cases, also, where sulphur compounds, occurring on the tongue and false membrane decompose the ferric chloride, a further modification is adopted, thus:—Menthol, 10 Gm.; toluol, *q.s.* to make 36 C.c.; absolute alcohol, 61-62 C.c.; creolin or metacresol, 2-3 C.c. In cases of true diphtheria preference is to be given to the original mixture. It should be applied every three hours until the temperature becomes normal and the general condition of the patient is satisfactory, after which three applications daily will be found sufficient. The development of the diphtheria bacillus is said to be checked by the remedy, whilst fully developed forms are destroyed in a few seconds. The mixture may be kept in stoppered bottles for several months without change, and, though after a time aromatic ethers are developed, the activity of the preparation is not in any degree affected (*Deutsche Med. Wochen.*, through *L'union pharm.*, xxxv., 538).

Crystallisation of Syrups. P. Carles classifies syrups into those which remain practically unaltered, those which ferment, and those which tend to crystallise, the last being reputed to be subsequently more liable to change in consequence of loss of sugar. It is pointed out, however, that crystallisation only occurs when, at the prevailing temperature, the water is supersaturated with sugar. If the supersaturation is great and the temperature low crystallisation takes place uniformly over the whole of the inner surface of the containing vessel,

whilst if the supersaturation is not so great, and the temperature moderate, the crystals form upon the coldest parts of the bottle only. It may be taken for granted that in full bottles the syrup is always saturated at the temperature for the time being, except when the crystals are confined to the bottom of the bottle. In the latter case a syrup remaining saturated throughout the winter would be under-saturated if kept until the following summer, and on the bottle being inverted the formation of streaks in the liquid would prove that there had been layers of different densities. If this condition existed in the case of syrups requiring the full complement of sugar for their preservation, it is easy to see that crystallisation would naturally be followed by fermentation. *Répertoire* [3], xvi., 539).

Adulteration of Beeswax.

A. Kremel shows that it is possible to produce, by mixing Japan wax, stearic acid, and ceresin in suitable proportions, a compound closely resembling genuine beeswax in appearance, possessing the same melting point and refracting index, yielding the same figures by Hübl's saponification process, and differing only in having a lower specific gravity. He recommends that in all cases the specific gravity should be taken and qualitative tests applied for stearic acid, resin, and Japan wax (*Pharm. Post.*, xxvii., 465).

Aristol for Burns.

The application of aristol in cases of burning has been found very serviceable by several observers on account of its anæsthetic action. Professor Haas states that in addition to its favourable influence in relieving the pain, it has powerful antiseptic properties (*Morgagni*, July, 1894). The affected parts are first to be washed with a two per cent. solution of boric acid, the vesicles opened, and the burned areas covered with aristol gauze, over which sterilised cotton, gutta-percha, and a bandage are applied. After the secretion has diminished, aristol may be insufflated in substance or applied in the form of a ten per cent. ointment.

A long paper is published in the *Archiv. der Pharm.* by Professor E. Schmidt, in which he supports his former statement that the base occurring in the roots of *Scopola atropoides*, the seeds of *Hyoscyamus niger*, *Datura stramonium*, and the leaves of *Duboisia myoporoides*, as well as the roots of *Atropa belladonna*, and having a composition corresponding to the formula $C_{17}H_{21}NO_4$, is in all essential particulars identical with Ladenburg's hyoscine, and that the base which Ladenburg isolated from henbane seed under that name, together with hyoscyamine and atropine, is not an isomer of atropine but is scopalamine. That view is also held by Dr. O. Hesse, who has shown that the pseudatropine described by Ladenburg as a product of hyoscine has not the formula $C_8H_{15}NO$, but that of scopoline, $C_9H_{13}NO_2$, as ascertained by Schmidt, and that the composition of the base, named hyoscine, from which it is derived, should be represented by the formula $C_{17}H_{21}NO_4$ instead of $C_{17}H_{23}NO$. Schmidt does not dispute the possibility of a hyoscine base existing isomeric with atropine and hyoscyamine, since there are *duboisia* leaves, anatomically indistinguishable, which contain hyoscyamine, and others which contain scopalamine, while E. Merck has recently obtained from them another base, which he has named pseudohyos-

cyamine. Schmidt, however, has not obtained hyoscine having the composition $C_{17}H_{23}NO$, and all the samples of commercial hyoscine, even that bearing Ladenburg's name, consist essentially of scopoline. He objects, however, to call this base hyoscine according to Hesse's suggestion, since he was the first to show that it is not, as previously assumed, an isomer of hyoscyamine, pseudohyoscyamine, and atropine, but that it has the formula $C_{17}H_{21}NO_4$, and is metameric with cocaine.

Solubility in Oils of Dulcin.

Dr. C. Bechert has ascertained that dulcin dissolves in 237 parts of castor oil, communicating to it an agreeable sweet taste. Cod-liver oil dissolves rather less ($\frac{1}{3}$), and some time elapses before the sweet taste of the substance becomes sensible. The presence of free fat acid in oil appears to facilitate the solubility of dulcin very considerably (*Apotheker Zeitung*, ix., 951).

Antidotes and Antitoxins.

In a lecture delivered before the Medical Association in Halle, Professor Harnack dealt with Behring's statement that anti-diphtheritic serum is the first curative product of the kind which is harmless, all others being poisonous themselves. In reference to this proposition he holds that anti-diphtheritic serum must be regarded as an antidote, and consequently analogous to other substances which act as antidotes. These he divides into two classes, chemical and physiological, the former producing effect by a chemical alteration of poison which renders it harmless, while the effect of physiological antidotes is produced by their action upon poisoned organs of the body, and by restoring their disordered functions. Hence he argues that while, in the nature of things, chemical antidotes are harmless, the physiological antidotes must be themselves poisons. Applying this view to Behring's serum it is inferred that if its harmlessness be proved, it must be a chemical antidote capable of rendering the poison harmless by means of a chemical alteration taking place in the fluids of the organism. He considers, moreover, that an antagonistic influence may be exercised over the pathogenic micro-organisms in two ways, and that while the cells resist the action of the parasites, substances are developed in the animal fluids which are capable of rendering the poisonous products of the bacilli harmless. The development of these substances, however, would appear to be determined only by the actual cause of the disease (*Pharm. Zeitung.*, xxxix., 874).

SNAKE POISON.*

BY PROFESSOR W. D. HALLIBURTON, F.R.S.

A complete investigation into the subject of snake poison must attempt to answer three questions:—(1) What is the poison? (2) What is its physiological action? (3) How can one best prevent or counteract this action?

Dr. C. J. Martin's papers relate to the first two questions only. The method of obtaining the poison was an ingenious modification of that adopted by the Indian snake men. The yield of poison per bite was very small, and so considerable time and patience were consumed in getting enough material to work with. The small quantity secreted is apparently amply

* Extracted from an article in *Science Progress*.

atoned for by quality, the minimal fatal dose per pound weight being considerably less than that given by the Indian Snake Commission for the cobra. Some idea of this virulence may be gathered from the fact that one-thousandth part of a grain invariably kills a rabbit of five pounds weight in about a hundred seconds. This extraordinary toxicity becomes more astounding still when we consider that the poison is a proteid undistinguishable by chemical methods from those daily used as food by all of us.

The first investigation of any importance into the chemistry of the snake poison was by Prince Lucien Buonaparte, in 1843, on the poison of an adder. He found that the activity of the poison was associated with that portion precipitated by alcohol; and he gave the name "viperine" to this precipitate. Dr. Weir Mitchell next turned his attention to the subject about 1860; and he is essentially the founder of our present knowledge concerning snake poison. Crude as were the methods of animal chemistry in his day, they nevertheless led him to the right conclusion that the toxic principle of the venom is albuminoid in nature. He termed it "croatalin" in the case of the rattlesnake. From that time till 1886, in conjunction with Reichert, he continued his work, and confirmed his general conclusion in the case of other North American snakes. About 1871 the Indian snakes received their share of attention; and the names of Sir Joseph Fayrer and Dr. Lauder Brunton are associated with valuable researches concerning the venom of the cobra, kraits, and the Indian viper.

In 1883 Wall, in 1886 Wolfenden, and in 1893 Kanthack, published most instructive contributions to our knowledge of cobra venom; the improved methods of chemical physiology enabling them not only to identify the poison as a proteid, but to show that the variety of proteid present is an albumose. Two observers only of importance have described poisons other than proteid in snake venom: one of these was Gautier, who regarded the venomous principle as alkaloidal; and the other, Winter Blyth, who gave the name "cobric acid" to a highly poisonous crystalline substance he claimed to have separated from cobra venom. Recent work has failed to substantiate these results, and alkaloids when present at all (and they are generally absent) are non-poisonous ones.

In the researches on the venom of the Australian black snake, Martin and Smith* found it necessary to exclude various classes of poisons, as well as to determine positively the nature of the venom. They excluded in the first place by appropriate experiments the presence of micro-organisms, ferments, alkaloids, ptomaines, and crystalline acids.† In the second place they showed that the poison was a proteid. The methods for the separation of proteids from one another are highly technical. It will therefore be sufficient to say that the manipulations were of the most recent and perfect kind, and pass to the results obtained. In the proteid mixture three proteids were

* The Venom of the Australian Black Snake (*Pseudechis porphyriacus*), by C. J. Martin and J. M'Garvie Smith, *Proc. Roy. Soc. N.S. Wales*, August 3, 1892; and *Journal of Physiology*, vol. xv. (1893), p. 380.

† A questionable trace of an organic acid found did not possess toxic properties.

obtained: one an albumin, and the other two albumoses. The albumin is not virulent, but the two albumoses (corresponding to proto- and hetero-albumoses of Kühne) are extremely poisonous. They each have the same physiological action, and this is the same as that produced by the venom itself. The venom can be momentarily boiled without impairing its activity, but prolonged boiling for days destroys its virulence.

(To be continued.)

PEPPERMINT OIL.

An extended investigation of this oil by Power and Kleber has shown the presence of the following constituents (*vide Schimmel's Bericht*):—

Acetaldehyd	CH ₃ ·CHO
Valeraldehyd	(CH ₃) ₂ CH·CH ₂ ·CHO
Acetic acid	CH ₃ ·COOH
Isovaleric acid	(CH ₃) ₂ CH·CH ₂ ·COOH
Pinene	C ₁₀ H ₁₆
Phellandrene	C ₁₀ H ₁₆
Levillimonene	C ₁₀ H ₁₆
Cineol	C ₁₀ H ₁₆ O
Menthone	C ₁₀ H ₁₈ O
Menthol	C ₁₀ H ₁₉ ·OH
Menthyl acetate	C ₁₀ H ₁₉ ·C ₂ H ₃ O ₂
Menthyl isovalerianate	C ₁₀ H ₁₉ ·C ₅ H ₉ O ₂
α Menthyl ester	C ₁₀ H ₁₉ ·C ₅ H ₁₁ O ₂
Alacton	C ₁₀ H ₁₆ O ₂
Cadinine	C ₁₅ H ₂₄

Seventeen different samples of oil were examined, two of them being prepared from specially selected material in Messrs. Schimmel's factory, and the physical character of all of them were determined. The results show that the specific gravity of peppermint oil varies between .905 and .916. The rotatory power is very variable—ranging from -25° to -35°—and it does not appear to have any direct relation to the amount of menthol. The menthol present in a free state may vary from 24.2 to 72.7 per cent. and the menthol present in the state of ester may vary from 3.45 to 14.12 per cent. For determining the amount of free and combined menthol the oil is treated by the process described at page 458 of the present volume of the Journal. The result thus obtained is slightly affected by the presence of other esters besides menthyl acetate, but the error is too small to be of importance. From the convertibility of menthone into menthol by reduction with sodium it is also possible to determine the amount of menthone.

Applying this method of menthol determination to fractionated portions of the seventeen samples of oil, the results given in the annexed table were obtained:—

	Spec. grav. at 15° C.	Rotation 100 Mm.	Menthols ester, per cent.	Free Menthol, per cent.	Total Menthol, per cent.
I. F. B. from dry herb	0.9140	32° 0'	14.12	45.5	59.6
Ia. F. B. " fresh "	0.9180	28° 26'	11.25	43.2	54.5
Ib. Wayne Co., N. Y., 92	0.9158	28° 45'	9.32	40.8	50.1
Ic. " " " 98	0.9110	32° 30'	9.04	46.1	55.1
Id. Rectified oil, F. S. and Co.	0.9110	32° 45'	8.61	51.0	59.6
Ia. V. B. Co., Mich., 93	0.9067	29° 26'	6.39	43.6	50.0
If. Wayne Co., Mich., 93	0.9185	28° 30'	7.73	50.3	58.0
II. St. I. Co., Mich., 93, I.	0.9185	30° 45'	8.68	28.9	37.6
Iia. " " " 93, II.	0.9083	19° 30'	4.23	39.6	43.8
Iib. Rose Mitcham	0.9050	28° 55'	4.37	44.2	48.6
Iic. Crystal white Mich.	0.9105	28° 55'	6.74	44.2	50.9
Iid. Redistilled oil	0.9105	28° 30'	8.59	46.5	55.1
III. Mississippi	0.9250	18° 40'	11.47	24.2	35.7
IV. Japanese normal	0.9100	84° 45'	3.45	72.7	76.2
V. dementholate d	0.9080	31° 20'	5.71	55.1	60.8
VI. Mitcham	0.9070	27° 55'	4.92	53.9	58.8
VII. Saxon	0.9100	36° 0'	6.38	61.2	67.6

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ERASURE FROM THE REGISTER.

THE suggested need on the one hand of an ethical code by which the actions of registered chemists and druggists, in the exercise of their calling, could be subjected to control, and, on the other hand, of a power to strike off the Register the names of persons who are guilty of misconduct, may at least be regarded as indicative of a feeling that, however admirable liberty of action may be, something more than mere individual power of restraint is requisite for the well-being of a community. Having little belief in the practical efficiency of an ethical code for anything more than additional opportunity of transgressing, the other alternative of erasure from the Register may be considered in the light of its application in the medical profession.

At the recent meeting of the General Medical Council the power to remove a person from the Register has been exercised in several instances where charges of conduct, infamous in a professional respect, have been made and supported by evidence. In some instances where such a charge has been made, the Council, after inquiry, has decided that the alleged offence has not been committed, and the position of the accused person has been preserved. Without referring more specifically to cases where the alleged offences related to the details of medical practice, one may be mentioned in which promotion of the sale of a secret quack medicine was the offence complained of. From analysis of CONGREVE's balsamic elixir it was considered not to justify the representations published as to its remedial powers, and a medical practitioner who had associated himself with the proprietor for promoting its sale, was held to have been guilty of infamous conduct in a professional respect, and

the Registrar was directed to remove his name from the Medical Register.

No one who is acquainted with the drug trade can doubt that a similar power, vested in the Council of the Pharmaceutical Society, would exercise a wholesome influence, and be productive of beneficial results. The power which the Privy Council has, under section 26 of the Pharmacy Act, to direct the name of a person convicted of any offence against the Act to be erased from the Register of Chemists and Druggists, has never been exercised, and probably the Privy Council is too far removed from cognisance of the conditions obtaining in the drug trade to admit of the power being exercised even from a public point of view.

It is in regard to action detrimental to the general interests of the chemists and druggists that the power of permanent or temporary erasure from the Register is desirable, but it is unnecessary to do more than speak in general terms of the necessity for such a power as a controlling influence, and if requisite, as a means of duly punishing offences. In the paper recently read before the Manchester Pharmaceutical Association by Mr. TAYLOR, reference was made to several matters which might be appropriately dealt with in that way, and we fully agree with the opinion that, if the power existed, observance of ethical principles would soon be developed as a natural consequence. Meanwhile the procedure adopted by the General Medical Council in reference to offending members of the medical profession may be instructive.

In addition to the steps taken for removing names from the Register, the Medical Council has recently been active in regard to the improper employment of unqualified assistants, and has recorded on its minutes that in the event of cases being brought before the Council in which there is evidence of misconduct in that respect, they will be regarded as charges of infamous conduct. The *Lancet*, in commenting upon this decision, remarks that, although the practice of employing unqualified assistants has been customary from time immemorial, there are grave public and professional reasons why it should be reduced to a minimum. Since the medical practitioner is supposed to be registered as a qualified person, the public has a right to expect that it will receive authorised medical assistance from him in case of need. The practice of placing an unqualified assistant in charge, perhaps at a distance from the residence of the principal, and under his name of allowing such assistant to deal with patients, is admitted to be unjust to the patients, and, in some instances, even worse. The evil is sometimes even the result of connivance on the part of qualified persons who take no other part than that of facilitating evasion of the Medical Act by lending their names to cover unqualified persons. Our contemporary acknowledges that, while the

public is deceived the profession is injured, and much of the undignified work which brings the profession into discredit is referable to the practice of employing unqualified assistants. Finally, it is urged that, as an obligation due to the profession, the Medical Council should insist upon a sharp line of demarcation between the qualified and the unqualified, and should not allow registered practitioners to enable unqualified persons to act as if they were duly qualified.

THE REVISION OF THE BRITISH PHARMACOPŒIA.

THE want of a revised Pharmacopœia is sufficiently urgent to make any possible postponement of its issue a matter for regret, and, in that sense, the apparent existence of conflicting opinions as to the proper nature of the work and the mode in which its revision should be carried out cannot fail to attract the attention of pharmacists. In our issue of the 15th inst. the full text of the Report of the Pharmacopœia Committee of the General Medical Council was published in the form that it was received and entered on the minutes. In consequence of objections raised by some members of the Medical Council to the original draft of the report, the motion for its adoption was met by an amendment, which was carried on a vote being taken. On reconsideration of the matter it was agreed that certain questions should be left open for further consideration, and that the constitution of the Pharmacopœia Committee should be brought before the Council at the meeting in May next.

One of the objections raised to the original draft report of the Pharmacopœia Committee was to the effect that, under the proposed arrangements, the new work would be purely a pharmacist's pharmacopœia; and, in the course of the discussion, Dr. GLOVER stated that the Council would not be at all satisfied unless provision were made for some sort of recognition of the therapeutical side of the subject, which he suggested might be done by appointing a therapeutical editor as well as a pharmaceutical editor. This idea of introducing therapeutics into the Pharmacopœia, and making it not only the standard and guide whereby the nature and composition of substances used in medicine may be ascertained and determined, but also an authoritative work on the medical properties and uses of drugs, points to an entirely new departure. It appears to be suggestive of some confusion of the modern interpretation given to pharmacology, with the purposes for which pharmacopœias have hitherto been intended. That medical opinion and usage should have a preponderating influence in determining what a pharmacopœia shall contain is self-evidently appropriate, and ample provision for control in that respect appears to have been made by the recommendation of the Pharmacopœia Committee that the medical authorities of Great Britain and Ireland should be

asked to assist in the compilation of the new pharmacopœia, and that a consultative committee, consisting of the President of the Council, Sir DYCE DUCKWORTH, Dr. LEECH, and Mr. BRUDENELL CARTER, should be appointed to confer with the Editor, presumably in regard to the medical aspect of the work.

But the introduction of matter relating to the recognised action of drugs, is a proposition which would go far beyond the limits of any pharmacopœia in existence, and, as Sir Richard Quain remarked, it would take years and years of investigation before a satisfactory result could be arrived at. Moreover, if that difficult task were attempted, it would probably be attended with undesirable consequences. It might be expected to favour the production of an extra pharmacopœia indicating the uses to which medicines might be applied, and bearing the title of 'Every Man his own Doctor.' In the discussion at the Medical Council, Mr. BRUDENELL CARTER objected to such an interpretation of "other matter and things," which the Council is empowered to introduce into the Pharmacopœia. These relate to the list of medicines and compounds, and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed. In a letter to the *Lancet* last week he further contends that grammatical construction of the words in the Medical Act affords no justification for converting the Pharmacopœia into an analogue of 'Whitaker's Almanac,' by adopting the suggestion that it should state the supposed curative properties of medicines. In his opinion the Pharmacopœia should have the one object of securing uniformity of strength and composition in all preparations which are sold under certain names. Mr. CARTER further mentions the introduction of synonyms as being within the province of the Medical Council, in order to prevent such practices as the sale of paregoric elixir without the opium which is properly an ingredient of the compound tincture of camphor, or any similar alteration of the composition of official medicines.

From that point of view the addition or omission of articles should be governed solely by consideration whether the articles in question are sufficiently used by medical practitioners to render uniformity in preparing them a matter of importance. In regard, also, to the exclusion of drugs or preparations which are inert or useless, prevailing medical opinion must, of course, decide what is desirable, and for these purposes the proposed Consultative Committee, assisted by the medical authorities of the kingdom, would suffice. We thoroughly agree with that view, and in that sense the Pharmacopœia may be properly regarded as essentially the pharmacist's book, the rule and guide

of his practice, mainly to serve the purposes and requirements of medical practitioners. Any attempt, however, to expand the Pharmacopoeia into a treatise on pharmacology or a guide to the uses of medicines, though introducing matter relating to its proper subject, would be an unwise interference with private authors, while committing the Council to current hypotheses which time might not confirm.

BRITISH PHARMACEUTICAL CONFERENCE.

JUDGING from the figures supplied by Mr. HENRY MATHEWS, the local secretary at Oxford of the British Pharmaceutical Conference, the result of the arrangements as carried out at the latest meeting is exceedingly satisfactory, and should prove decidedly encouraging to other small towns that may hesitate to send an invitation on the score of expense. It will be remembered that a slightly higher price than usual was charged for the Oxford tickets. The total amount received was £173 3s. 0d., and, against this, the expense of the whole of the entertainments, from Monday to Thursday inclusive, amounted to £186 12s. 0d. only, so that there was but a small deficit. This was at once subscribed by a few members of the local committee, and it has been rendered unnecessary to solicit pecuniary assistance from the committee generally, or from persons outside the craft. The small increase in the price of the tickets is thus quite justified, as tending to keep the Conference in a position of independence, and Mr. MATHEWS is to be cordially congratulated on this successful termination of his labours as local secretary to the Conference.

PRODUCTION OF OZONE.

ACCORDING to *Engineering*, the most recent method of producing ozone—that of Lieutenant POULSEN, a Danish officer—is based on the oxidation of phosphorus in a special apparatus. A wide-necked glass jar is closed with a finely perforated porcelain plate, and two inches below this is a similar plate inside the jar. Through the centre of each passes a glass rod, which is curved upwards at the lower end and terminates in a small cup for holding a piece of phosphorus. The jar contains sufficient acidulated water to submerge the phosphorus when the apparatus is not in use, and, when ozone is required, a small quantity of potassium permanganate is added to this, and the phosphorus raised by means of the glass rod above the surface of the liquid. Phosphorus acid is formed by contact of the phosphorus with the air, and converted into phosphoric acid by the action of the permanganate, whilst, simultaneously, ozone is produced and escapes through the perforations in the porcelain plates.

COAL-TAR COLOURS.

MR. A. G. GREEN'S English edition of the 'Systematic Survey of the Organic Colouring Matters,' published by Drs. SCHULTZ and JULIUS six years ago, contains an interesting historical account of the coal-tar colour industry. Although only between thirty and forty years old the industry now employs some 40,000 operatives, including over 500 trained chemists; and the annual value of the product extends to millions of pounds. Although such large numbers of new dyes are constantly being discovered and patented, it is said that less than one hundred varieties are in actual use on a large scale, the remainder failing to show the necessary permanence.

PATIENTS AND MEDICAL TREATMENT.

PERCEPTION of the inability of patients to decide for themselves on the very difficult question of medical treatment would suggest to a logical mind the necessity of relying upon the judgment of properly qualified medical men whose lives have been devoted to the study of disease. Lord COLERIDGE, however, has made use of that circumstance as furnishing an argument against the use of antitoxin in hospitals and to support the opinion that only such treatment should be adopted as has been "proved to be a cure." The *British Medical Journal* justly ridicules this view of the matter as unreasonable and misleading. It indicates precisely that mental condition which offers a field for exploitation by the quack and the charlatan, not only among the ignorant multitude but also among persons of better education.

THE USE OF MAKE-SHIFT APPLIANCES.

ADAPTABILITY to circumstances and the power of turning existing conditions to account are no doubt potent factors in the survival of the fittest, and the *British Medical Journal* relates an instance in which these faculties were displayed by a bacteriologist who, having occasion to make experiments without the usual appliances, captured a hen, and fixed his culture tubes under her wing, with the result of obtaining the effects required. It is also mentioned that MARION SIMS' first speculum was the handle of a kitchen spoon, and that Sir WILLIAM FERGUSON is said to have amputated at the shoulder with a pocket-knife.

DANGERS OF PROMISCUOUS DRUG-TAKING.

DR. STANLEY MELVILLE, of Southport, in a letter to the *Lancet*, directs attention to the danger attending the promiscuous use of such drugs as antipyrine, and reports a case in which he was called to attend a lady in a state of extreme collapse, whose condition was for some time most serious notwithstanding the prolonged efforts to revive her. After her recovery Dr. MELVILLE ascertained that, on the advice of a friend, she had taken antipyrine

which she had no difficulty in obtaining, and of the potency of which she had no idea. On being remonstrated with, she remarked, "Why, my dear doctor, all my friends take it!" Dr. MELVILLE expresses the hope that, after his patient's experience, those friends may see the error of their ways, though he is less hopeful for the unfortunates who have not such an experimental warning to draw clinical pictures for their benefit. Surely this, and many other of the modern synthetic remedies, should be included in the Poisons Schedule.

MANCHESTER PHARMACY BALL.

THE second annual ball and musical promenade of the Manchester Pharmaceutical Association will be held at the Hulme Town Hall, Manchester, on Wednesday, January 23, 1895, when the doors will open at 7.30 p.m., the musical promenade commence at 8 p.m., and dancing begin at 9 p.m. Mr. E. S. JOHNSTONE will officiate as M.C.; the music will be furnished by Mr. J. H. GREENWOOD's band, and refreshments by Mr. MAX WEIGENTHALER. Tickets, inclusive of light refreshments (double tickets, 12s. 6d. each; single tickets—gentlemen, 8s. 6d. each, ladies, 5s. each), may be obtained of the hon. secretary, Mr. A. BLACKBURN, 7, Exchange Street, Manchester. Applications for tickets for others than members must be accompanied by a recommendation from a member of the Association, or one of the stewards of the ball, and early application is requested, as the number is limited.

CHEMICAL SOCIETY.

Two papers from the Research Laboratory of the Pharmaceutical Society were read at the meeting of the Chemical Society on Thursday last. In the first, on the chemical constituents of *Piper ovatum*, by Dunstan and Garnett, it was stated that an inert resin and a crystalline substance, having many of the properties of an alkaloid, but not possessing any basic power, had been extracted from the plant. The latter compound it is proposed to name "piperovatine." It forms colourless needles, which melt at 123°, and are nearly insoluble in water, light petroleum, or dry ether, but dissolve readily in alcohol, chloroform, or acetone. The alcoholic solution gelatinises on adding water. Piperovatine is optically inactive, and its formula is $C_{16}H_{21}NO_3$. It appears to be nearly allied to piperine, and is apparently hydrolysed by acids and alkalies, producing a pyridine base—possibly piperidine—and an acid. The physiological action of the base has been examined by Professor CASH, who finds that it acts as a temporary depressant of both motor and sensory nerves. It is a heart poison and acts on the spinal cord in frogs, causing a tonic spasm like that produced by strychnine.

In the second paper, by the same authors, it was stated that the active constituent of pellitory, *Anacyclus pyrethrum*, had also been separated in a crystalline form. This it is proposed to name "pellitorine." In most of its physical, chemical, and physiological properties it closely resembles piperovatine, possessing the general structure of an alkaloid, but being devoid of basic or acidic properties. It is possible that the two compounds may prove to be identical.

MISCELLANEOUS NOTES.

REPORTS of two cases of interest to pharmacists, heard in the Court of Session, Edinburgh, on Monday, will be found at pages 554 and 555.

ON December 19 the chemists of Newcastle and district held their fifth annual ball in the Old Assembly Rooms, Westgate Road, Newcastle. About fifty couples were present, and a most enjoyable night was spent. Messrs. JAMES DAVIDSON and A. R. BENNETT were the M.C.'s, and the following gentlemen acted as stewards:—Messrs. F. ARROWSMITH, G. CORMACK, R. S. HULL, R. MCCLUMPHA, W. WESTHEAD, and J. W. WHITTLE. The music was supplied by Mr. E. R. CORBETT's band. Dancing came to an end about 2.30 a.m.

AT the recent election of guardians at Louth, Lincs., Mr. H. D. SIMPSON, chemist and druggist, was elected at the head of the poll.

A BACTERIOLOGICAL institute is about to be established at the University of Kieff at an estimated cost of £10,000, and a well-known pharmacist of Moscow has given a house valued at £3000, with £500 in cash towards fitting it up as a bacteriological laboratory.

By a decision of the Kentucky (U.S.A.) Court of Appeals recently recorded, the State revenue authorities are upheld in the imposition of a special tax of \$50.00 per annum upon druggists for the privilege of dispensing spirituous liquors for medicinal use.

It is stated by a *Daily News* correspondent that an attack of purulent pneumonia at present prevailing in Paris originated in a cargo of green parrots landed some years ago at Bordeaux.

SOME time ago reference was made to the fact that steps were being taken to carry out a system of Russification at the University of Dorpat. It is now reported that the system has been carried out in such a rigorous manner as to lead to a protest by the students, who have ceased attending the lectures in the hope that the attention of the Tsar may be attracted to the matter.

AT Alais, in the department of the Gard, a laboratory is to be established for the supply of antiphtheritic serum, and the idea is being warmly supported by the townspeople and local authorities.

A CONSIDERABLE number of pharmacists have been elected to serve upon the newly-constituted Parish Councils, and we notice that at Hurstpierpoint the third place upon the list of successful candidates is occupied by a lady—FLORA MITTEN, pharmaceutical chemist.

THE Chemists' Assistants' Association held a musical social evening on Thursday, December 20, when the chair was taken by Mr. J. C. UMNEY. The programme consisted of songs, pianoforte solos, and recitations by members of the Association and their friends. Messrs. H. BROWN and A. C. MACKADAM acted as accompanists, and the programme was under the direction of Mr. F. C. LONG.

Proceedings of Societies in London.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, December 13, Mr. T. A. Henry, Vice-President, in the chair. A paper was read on—

A PIBE OF GRANITE.

BY HAROLD READ.

The essayist commenced his paper by contrasting the varieties of British granite which occur in Aberdeenshire, at Shap Tor, near Penrith, and in Devon. He then discussed its lithological characteristics, and touched on the older, as well as mentioning the more modern, theories as to its formation in the presence of superheated steam and under great pressure. He showed that it could not have been formed in the same way as the volcanic rocks of the present day, since breccias, pumice, etc., are never found associated with granites. The well-known example at Priestlaw was described as a case where granite could be formed by extreme metamorphism.

The various kinds of metamorphism produced by granite on adjoining rocks were illustrated by specimens.

Mr. Read then discussed the petrological characteristics of granite, describing the physical properties of the quartz, felspar, and mica.

The weathering of the rock was then treated, and the various decompositions of the constituents explained. It was shown how the silica and mica might be partially dissolved and washed away, the alkali silicates of the felspar decomposed by the carbonic acid gas in solution in rain water, and the soluble bicarbonates of calcium, potassium, etc., dissolved and carried away, the insoluble hydrous silicate of aluminium or kaolin being left.

In addition to several characteristic specimens of granite, its constituents and its products, the author exhibited several interesting microscopical slides illustrative of his subject.

A beautiful specimen of red granite from Mount Sinai, lent by Professor Atfield, was most interesting, attractive, and unique.

The paper gave rise to a discussion in which the Chairman, Miss Buchanan, Messrs. Wright, Brown, Tunbridge, Smith, and the Secretary took part.

The paper and discussion having occupied a considerable time, the paper on "Volumetric Analysis," by Mr. Burgess, was postponed to the next meeting, and the proceedings terminated.

CHEMICAL SOCIETY.

A meeting of the Chemical Society was held on Thursday, December 20, the President, Dr. Armstrong, F.R.S., in the chair.

The following papers were read—

AN IMPROVED FORM OF BAROMETER.

BY DR. N. COLLIE.

The objections to the ordinary form of barometer are the weight of the instrument due to the amount of mercury employed, and the want of portability, owing to the tendency of the mercury to escape.

The form now produced obviates these difficulties.

The cistern containing the mercury reservoir is sealed on to a piece of capillary tubing such as is used for Sprengel pumps, and a side piece is sealed on to the cistern, and a tap fitted, so as to ensure connection with the atmosphere.

Sprengel tubing is used to connect the mercury in the lower and the top cisterns, which should be made of the same piece of tubing. The top cistern is sealed on to the Sprengel tubing in such a way as to form an air trap. The end of the Sprengel tube is blown out into a bulb, and the end of the cistern is drawn out so as to end in a fine tube, which projects into the bulb formed by the Sprengel tube. The joint is made by the bulb and the body of the cistern. By this means any air which might be present in the Sprengel tube collects in the trap and not in the Torricellian vacuum in the top cistern.

The Sprengel tube is connected to the lower cistern in the following way: It is prolonged into a fine tube of capillary bore, which dips almost to the bottom of the cistern, and is so bent as to follow the curve of the side of the cistern. By this means connection is obtained between the mercury in the two cisterns. The whole is mounted against a piece of plate glass with a millimetre scale etched on one side, and mirrored on the other. In reading, the scale is read so that only one line is visible to the eye, and hence all error of parallax is avoided.

If necessary, the barometer can be made in two pieces, the capillary tube being divided in the centre and then one part ground to fit into the other. By this means the barometer can be read by difference to $\frac{1}{10}$ Mm., and it can easily be filled and stored.

THE CHEMICAL CONSTITUENTS OF PIPER OVATUM. BY PROFESSOR DUNSTAN, F.R.S., AND H. GARNETT.*

NOTE ON THE ACTIVE CONSTITUENT OF THE PELLITORY OF MEDICINE.

BY PROFESSOR DUNSTAN, F.R.S., AND H. GARNETT.*

THE MEASUREMENTS OF HIGH TEMPERATURES BY THE PLATINUM PYROMETER.

BY C. T. HEYCOCK AND F. H. NEVILLE.

The melting point, or, more accurately speaking, the freezing point, of several metals has been determined by means of the Callender-Griffith pyrometer, which depends on the following principle:—When a current of electricity is passed through a platinum wire a certain resistance is encountered which can be measured; if the platinum is subject to alteration of temperature the resistance also alters, and this variation can be measured. The standards of the instrument are determined by comparison with an air thermometer, and also by measuring the resistance when the platinum is at the temperature of melting ice, boiling water, and boiling sulphur.

The freezing points of several metals are given, and found in most cases to approximate to those previously determined, with the following exceptions:—

Magnesium, formerly 500-800°, now 633°
Aluminium, " 600°, " 653°

* The report of these papers which were to have been provided had not arrived at the time of going to press. See summary on page 550 [Ed. Pharm. Journ.]

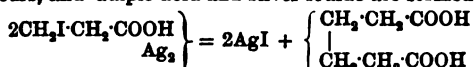
Since large quantities of metal were required in these experiments, it could not be chemically purified, so the purest obtainable in commerce was used and several specimens from different sources examined.

THE PREPARATION OF ADIPIC ACID AND SOME OF ITS DERIVATIVES.

BY DR. W. H. INCH.

In order to prepare a large quantity of this acid several methods were tried, but in all cases with unsatisfactory results.

The most satisfactory method was found to be that of Wislicenus (A. 149, 221), and consisted in treating β -Iodo-propionic acid with silver, when condensation occurs, and adipic acid and silver iodide are formed—



But the difficulty in this case is the preparation of the β -Iodo-propionic acid, which has to be prepared from glyceric acid and phosphoric iodide, and the yield of glyceric acid from glycerin by oxidising with nitric acid was so small that only very small quantities could be prepared.

The other methods given are by the oxidation of sebacic acid with nitric acid ('Laurent,' *Ann. de Chimie* [2], 66, 166) and by the oxidation of fats with nitric acid, in which, however, the sebacic acid is supposed to be an intermediate product.

The author, in repeating the experiments, found that by no method of oxidation could he obtain anything but a minute quantity of adipic acid. When fats are treated with nitric acid, sebacic acid is formed, but very little adipic acid. From the small quantity of acid obtained by Wislicenus' method the author formed the bromo-derivative, which on treatment with water yields the corresponding hydroxy-derivative.

THE LATENT HEAT OF FUSION.

BY HOLLAND CROMPTON.

The author has endeavoured to trace the connection, if any, between the latent heat of fusion of the elements and their compounds and their chemical constitution. He found that in many cases the entropic change, which is represented by the product of the latent heat and atomic weight divided by the absolute temperature of fusion, is proportional to the valency of the element. Or if η be entropic change, then $\eta = C_v$ when C is a constant. He found that in compounds the law seems to hold good for the sum of the valencies of the elements in the compounds.

THE CONDITIONS OF REACTION OF HYDROGEN CHLORIDE WITH THE ALKALINE EARTHS.*

BY V. H. VELEY, M.A.

The author found that if HCl be very carefully dried over phosphoric pentoxide or lime no reaction took place at temperatures from 10°-40°, when the gas is placed in contact with dry lime. Similarly there is no reaction at temperatures below 40° with magnesia, though magnesia is most difficult to obtain in the dry condition. With barium oxide action always occurred, and this was probably due to the incomplete drying of the oxide.

A paper on the interaction of bismuth haloid compounds and hydrogen sulphide, by M. M. Pattison Muir, M.A., and E. Eagles, B.A., was taken as read.

Scottish Transactions.

EDINBURGH PHARMACY ATHLETIC CLUB.

The third annual smoking concert of the Club was held in the Imperial Hotel, Edinburgh, the 19th inst., at 8.30, Mr. David MacLaren in the chair. There was a large attendance, and an excellent programme of vocal and instrumental music made time pass rapidly and pleasantly. Mr. Jaap, of the Edinburgh Harriers Club, gave a fine exhibition of Indian club exercise. The arrangements were in charge of the Hon. Secretary, Mr. J. P. Gibb. The Club Rooms, at 79, Leith Street, are now open for the season, and members are provided with keys to enable them to use the rooms at any time.

American Pharmaceutical Association.

THE DEMANDS OF PHARMACY UPON ITS GRADUATES.*

BY W. W. KERR.

It augurs well for the future of pharmacy in the United States that so much attention is being paid, in recent years, to the preliminary education of those who are to engage in its practice hereafter, and to the discussion of the question of what should constitute that initial training. It is a healthy outgrowth of the impression that has been slowly but surely fastening itself upon the minds of pharmacists themselves, that theirs is a learned profession, taking rank with the other learned professions, and like them demanding a peculiar fitness and a special training. This impression has been years in taking shape and formulating methods, but it is just now experiencing a spirited revival as the result of its reflection from the profession to the people, where it has crystallised into pharmacy laws, and is now, by reflex action, coming back upon its originators in the shape of louder and more exacting demands for higher education. There is no longer room for discussion as to the necessity for this special preliminary training, nor limit as to the height to which it should be carried, but the question is—in what shall it consist? What shall constitute the armament of those who are turned out from our schools as competent to dispense the physic upon which the lives of thousands hang? It of course rests with the colleges of pharmacy to determine the methods by which the instruction may be best imparted, and largely as to the extent to which it should be carried; but as demand must always regulate the quality as well as the quantity of the supply, their curriculum must be to a great extent measured by the demands of the profession at large, and it is therefore pertinent that those demands should be made known from the standpoint of the consumer, that the supply may be regulated accordingly, and it is to this fact that this paper owes its existence.

In this discussion, as in most others, there are two extremes and two parties, the one tending to the one

* Read at the Asheville meeting, 1894.

pole and the other to the other, which is probably the best way to determine the "happy medium" along which the true policy usually lies. Very naturally the tendency of the teacher of pharmacy is in the direction of the higher scientific education of the student in preference to the more practical, while with the official pharmacist—if I may be allowed to resuscitate an old word and give it a new meaning—the tendency is toward the practical rather than the scientific. I would not be construed as under-rating the great advantage of a careful, technical education, or under-estimating the substantial progress being made of late years by the schools, in the direction of the practical, but, on the other hand, I heartily recognise and appreciate both, and am simply desirous of contributing towards the further promotion of the latter, without in any degree lowering the standard of the former.

The young graduates, when they leave college, enter the service of one of two patrons; the retail pharmacist, as clerks, or the public, as proprietors. By far the larger part probably assumes the first relation, and as the requirements in either case are substantially the same, it will be sufficient to ascertain the "demands of pharmacy upon its graduates." Now practical pharmacy includes three classes of duties, which may be set down as professional, comprising the identification, preservation, testing, compounding, and dispensing of drugs and chemicals; manipulative, embracing the care of the stock, its proper display, the ornamentation of the store, etc.; and the commercial, or buying and selling, and generally the business management. A fair knowledge of these several classes of duties in all of their details will be exacted by the employer of those who come to him as applicants for positions as skilled assistants; these taken together make up his estimate of competency. If a diploma from a first-rate college of pharmacy is supposed to be a guarantee that its holder is fully competent—professionally, morally, and every other way—to discharge the duties pertaining to the practice of pharmacy, and when presented to a prospective employer, has a right to be so recognised; and if things that are equal to the same thing are equal to each other, then the diploma and competency are, or should be, interchangeable terms. But is it possible to meet the conditions of this axiomatic formula?

Possibly with our present facilities it is not and may never be, and yet the demand is not unreasonably exacting, and will not be lowered, and hence must ever remain the goal of pharmaceutical teaching, though like the circulating decimal, it is ever approaching and never reaching, it must go on and on in that direction.

Several conclusions may be drawn from these considerations. It would lengthen this paper too much to attempt to cover the whole ground. Two or three lying nearest the surface must suffice.

The first is, that the diploma of a college of pharmacy must represent a greater or less amount of practical experience. This must follow if it be admitted on the one hand that experience is an element of fitness, and contended on the other that

those institutions are competent to perfect that fitness. That this is a difficult feature of the contract is not denied. To fit the student for the proper discharge of the first class of duties mentioned above is easily within the reach of the college curriculum, but to include the other two is, for obvious reasons, more difficult, and can only be compassed by resorting to the only source of supply at present available, and that is the shops where the business is conducted. It is hardly sufficient to urge that it is unfair to exact of a college faculty to certify to a proficiency which is not in their power to confer, and of which they can have no personal knowledge. If practical experience is an essential pre-requisite of a finished pharmacist, then somebody must be responsible for its presence. Certainly the future proprietor cannot be expected to "go back of the returns" and invest his money and his reputation in an experiment upon which such grave issues hang; the State boards of pharmacy have no means of recognising its quantity or its quality, not enjoyed to a greater degree by the colleges, and so it is thrown back upon those who labelled the package to become responsible for its contents—and hence the great work before our schools should be in the direction of overcoming the difficulty rather than urging it as an argument for shifting the responsibility upon some one else.

A second deduction is that the practical training should be contemporaneous with the college course rather than before or after it. When it precedes it the trouble lies in determining its character from want of personal knowledge as to whether it was obtained in a saloon with a patent medicine attachment, or in a legitimate pharmacy, and, if in the latter, whether at the cigar or prescription case. The same is true to a great extent when it succeeds it. But when both are carried along together, the practice forming a part of the course, as it were, as far as possible in the vicinity of the school, and to some extent under the eye of the teacher, the difficulty will be largely overcome. But here again the impracticability of the scheme, in most cases, will be urged against it. In this age of progress the impracticable is fast ceasing to be an impediment to the onward march of improvement; it is becoming an obsolete term in pharmacy as well as elsewhere. While it is true in the cities where our schools of pharmacy are located that employment could not be found for all the students within their walls, there are hundreds of pharmacies all over the country, including many of the smaller towns, conducted by professional proprietors on a professional basis, and where in many respects the very best practical training can be obtained, which by proper concert of action with the colleges might be utilised to supply the demand. The fitness of these establishments can be easily ascertained through the several State associations and the boards of pharmacy, if a systematic and united effort in that direction were organised, and as time rolls on their number will increase, until the great end to which the whole movement looks be accomplished, when any drug store in the country will be a fit school for training our students of pharmacy in the practical duties of their profession.

Finally, it may be seriously doubted whether our colleges of pharmacy have yet done all they can within themselves towards perfecting this branch of a finished pharmaceutical education. What has been accomplished justifies the prediction that more may be. There are fixed principles underlying business and the general management of a store, just as in the case of pharmacy proper; and why may not these be formulated into lectures and other methods of imparting instruction, which will be as effective in shaping and guiding the future course of the students? That teacher has largely failed in his work who does not succeed in impressing his own individuality and his own methods upon the minds of his pupils—who does not impress them with the idea that he is the best preceptor in the world in his particular line; and why may not this influence be exerted in the direction of fixing sound business principles and correct manipulative methods, as well as pharmaceutical skill? The increase in the length of the course from two to three years, already adopted by some institutions and contemplated by others, will afford increased opportunity for including this sort of teaching in the regular curriculum, and “the demands of pharmacy upon its graduates” call loudly for the innovation.

Parliamentary and Law Proceedings.

PROCEEDINGS IN THE SCOTTISH COURTS.

ACTION FOR SLANDER AGAINST THOMAS KEATING.

In the Court of Session, Edinburgh, on December, 24, the trial took place before the Lord Justice-Clerk and a jury, of the action raised by William Foster, wholesale druggist, oil and colourman, 94, High Street, Edinburgh, against the partners of the firm of Thomas Keating, insect powder manufacturers, 12, Bride Lane, London.

The plaintiff sued the defendants for payment of £1000 as damages for slanderous statements alleged to have been contained in the condescendence in an action instituted by Keating against the present plaintiff. In that action it was sought to have Foster interdicted from selling as Keating's insect powder, insect powder which was not manufactured by the firm. In his statement of facts the plaintiff stated that the defendants did not sell their insect powder in less quantities than sixpenny packets or tins, and that the poorer classes could not afford to buy so much at a time. Other equally good insect powders were sold in penny and twopenny packets, and on account of their cheapness and excellence had obtained considerable sale in preference to Keating's sixpenny packets. The defendants, he said, became aware of this, and conceived in consequence great ill-will and malice towards the vendors of rival insect powders, and especially against those who sold it in penny-worths. The defendants adopted schemes to suppress, if possible, the sale of these powders, extort money from the vendors of them, and at the same time advertise their own insect powder. With that view they circulated numerous advertisements, such as the following:—(1) “£5 reward; easily earned; no trouble. Write me first if you have any doubt.” (2) “I will pay £5 to the first person, whether chemist's assistant or one of the public, who will afford me such information (which I engage to treat as absolutely confidential) as shall lead to the conviction of anyone who improperly substitutes other powders for mine.

“I call attention to the case below. As a matter of fact, I took this course last year, and in the end the reward and heavy costs came out of the substitutor's pocket, and I have every reason to believe that the course I adopted was highly satisfactory to the neighbouring chemists, as well as to the public and myself.—Thomas Keating, 12, Bride Lane, London.” Under the heading “A Stores Caught,” the case of Keating v. Kibble was referred to. The plaintiff averred that the import and meaning of these advertisements was (1) that disreputable persons might easily earn £5 by concocting evidence which would support actions such as Keating v. Kibble; (2) that assistant shopkeepers were invited, without the knowledge of their masters to substitute another insect powder when Keating's was asked for, and then inform Thomas Keating thereof, and the information would be treated as absolutely confidential, and the assistant would receive £5 for the information. The object of the defendants was by these means to get up unfounded actions of interdict in the Court of Session against traders and others for advertising purposes, and for the purpose of furthering their schemes to suppress rival traders in insect powders, and not for the purpose of protecting any legitimate interest they had in a *bona fide* trade.

The plaintiff further averred that in August, 1893, defendants became aware that he sold insect powder in penny and twopenny packets, that they conceived an ill-will against him, and that for the purpose of gratifying their animosity and ruining his character and credit by means of such expedients as those already mentioned, they, in the following October, wrongfully and without probable cause presented a note of suspension and interdict in the Bill Chamber of the Court of Session, to have him prohibited from in any way offering for sale as insect powder manufactured by Keating, insect powder not manufactured by the firm. The statements contained in that note were to the effect that it had come within their knowledge that the present plaintiff had, for a considerable time past, been in the habit of selling certain insect powder not manufactured by them, as Keating's insect powder, which was inferior to theirs; that on dates named he sold this powder to certain parties named, and that for a considerable period he, or those acting for him, had been in the habit of fraudulently using Keating's trade name to denote an article which was not supplied by them; and that he thus fraudulently availed himself of the great reputation of Keating in order that he might find a ready sale for a spurious and inferior insect powder.

The plaintiff further stated that interim interdict was granted against him, but that when proof had been partly led a minute was put in on behalf of Keating abandoning the action. He averred that these proceedings were wrongful, oppressive, and malicious, and that he had suffered loss, injury, and damage on account thereof, for which he was entitled to reparation and compensation.

The defendants denied that they had conceived ill-will or malice against rival vendors of insect powders, and that the only purpose they had in inserting the advertisements referred to was the legitimate and reasonable protection of their own trade against dishonest dealing. They further stated that, in respect of information which they received, and after full enquiry, and being justified in believing that the plaintiff was in the habit of knowingly and fraudulently selling as their insect powder powder which was not manufactured by them, they took the necessary legal steps for protecting their interests, and preventing a continuation of the illegal practice. With reference to the abandonment of the action, they explained that prior to the date fixed for the

proof, the person who had originally informed them of Foster's habit of illegal dealing, and who had received the powders purchased by persons who were to be witnesses, and transmitted them to the defendants, intimated that he did not wish to give evidence on account of the publicity it would entail. They were advised that the evidence of the informant was essential to the success of their cause, and, as they had engaged to treat such information as absolutely confidential, they resolved to abandon the action rather than disclose the name of the informant, and gave instructions accordingly. They averred that throughout they acted in good faith, that they had reasonable cause for believing that the plaintiff was injuring their trade by dishonest dealing, and that they were not actuated by malice in what they did. They therefore asked to be assolized.

The evidence in the action occupied the whole of Monday and part of Wednesday.

The plaintiff, who was the first witness, gave a long statement with regard to the proceedings taken against him by Keating's. He complained that the interdict was served upon him without notice. His agent, whom he consulted in the matter, was greatly inconvenienced because he could not get the addresses of the men who were to give evidence against him until a late hour. After the action was abandoned they did not at once recall the interim interdict, and they left him with the charges unwidrawn. He gave up selling insect powder, but he found that people came in asking for it, and he had to keep some. The raising of the action against him became known. Travellers and others spoke to him about it, and some firms sent in their accounts. He could not put any figure on his loss in business, but he had been subjected to worry and annoyance. Before the action was taken by Keating's people he warned his son and daughter who assisted him in the shop not to sell the insect powder as Keating's.

Several witnesses spoke as to their having been in similar actions in Edinburgh, one of whom said the action against him had been abandoned, but that he might have a claim yet. Other witnesses spoke to having seen the statements against Foster, and said they regarded them as calculated to do him injury in trade. One of them said he knew Foster well, and that after seeing the statements, he made inquiries, and carried on business with him as usual.

Peter Morison, S.S.C., spoke to the conduct of the proceedings complained of by the plaintiff, and as to the grounds on which he made the statement in the present action.

Mr. Wyld, manager for Keating, was examined on behalf of the plaintiff at great length in regard to the advertisements for information. He said he never intended to associate them with criminal proceedings, nor to suggest that the information should be given by disreputable people. He had learned from correspondence in the *Chemist and Druggist* that a good deal of substitution was going on, and had taken proceedings in England. It was desired by the advertising to get information to prevent substitution. As to the statements founded on, he acted on the advice of his agents. He did not think the statements made by him against Foster were worse than those which Foster made against him.

Several witnesses were next called, who spoke to the doubtful character of the informants in the action which the defendant had raised against a man McCallum in Edinburgh, and also to a conviction for breach of the peace against one of the informants in the case against Foster.

Among the witnesses for the defence were Mr. Lambden, the London managing clerk of Keating's, and Mr. Thomas, one of the partners of Keating's

Edinburgh agents. Both spoke in regard to the proceedings complained of. Mr. Lambden said the stopping of the proceedings did not depend upon the character of the witnesses in McCallum's case, but because the informant who had sent them the names of the people that got the powder had stated that he was a chemist, and did not wish his name to be revealed until he should pass his examination. When Mr. Wyld was told that he insisted on keeping his information as confidential, and therefore abandoned the action. The proceedings, they said, were conducted in the usual way and under the advice of Counsel.

Counsel having addressed the jury, the Lord Justice-Clerk gave the charge, in the course of which he laid particular stress on the duty of the plaintiff to prove malice in order to make a good case.

The jury, after nearly an hour's absence, returned a verdict for the plaintiff, and assessed the damages at £50.

Counsel for the plaintiff was the Solicitor-General, Q.C., and Mr. T. B. Morison; Agent, Peter Morison, S.S.C.

Counsel for the defendant, Mr. Jameson and Mr. Dewar, Agents; Cornillon Craig and Thomas, S.S.C.

A DRUGGIST SUND FOR HEAVY DAMAGES.

The trial took place in the Court of Session, Edinburgh, on Monday, December 21, of an action raised by Mrs. Margaret Stewart or Lawson, widow of David Lawson, engineer, Glasgow, and David Lawson, John Lawson, and Margaret Jane Smith Lawson, all residing at 2, Andgovan Terrace, Sandyford, Glasgow, and Peter Lawson, Blackford, Perthshire, against John Christie, druggist, 356, Dumbarton Road, Glasgow, in which damages were sought to be recovered—of \$1000 by Mrs. Lawson, £250 each by David and John Lawson, and £500 each by Peter and Margaret Lawson in connection with the death of David Lawson, the husband and father of the plaintiffs.

On behalf of the plaintiffs it was stated that Mr. Lawson suffered from a complaint of the liver for many years prior to his death, and was in the habit of using internally extract of taraxacum as a remedy. He kept the extract regularly in his house to be available at any time. He had a recurrence of his complaint on Sunday, May 28, and used all the taraxacum he had in the house, and, not wishing to be without it, he sent his son Peter to the defendant's shop, at 356, Dumbarton Road, on the same day for a fresh supply. At the same time he gave his son sixpence to pay for it, and told him to write the word "taraxacum" on a piece of paper and affix it to the jar which held it. When Peter asked for extract of taraxacum he was told by the defendant's assistant that he had none of the solid taraxacum, but gave him a liquid which he said was better than the solid extract. His father sent him back with it, and when he returned to the shop the assistant made further search, and said he had found some of the solid extract. The assistant put into the jar a substance which he said was the extract, and he affixed to it a label on which there was printed the name and address of the defendant, and written "Extract of Taraxacum." He handed to Peter Lawson twopence of the sixpence, stating that the price was fourpence. On July 14, 1893, at his temporary residence, Lincoln Cottage, Eglington Street, Saltcoats, Mr. Lawson complained of an attack of his liver complaint, and to alleviate it he swallowed a portion of the substance which had been sold by the defendant, which he understood to be solid extract of taraxacum. He remarked to Mrs. Lawson that it had a very bad taste, and that he would take no more of it, and soon after began to feel unwell.

Two doctors who were called in diagnosed that Mr. Lawson was suffering from poisoning by strychnine. They administered an antidote, but he died shortly

afterwards. The plaintiffs said that he died from poisoning by strychnine, and that this was confirmed by a post-mortem examination and chemical analysis of portions of the body, instituted by instructions of the Procurator Fiscal, who afterwards addressed a letter to Mrs. Lawson stating that the Crown had concluded the inquiry relative to her husband's death, and "that the death took place through Noble accidentally supplying nux vomica instead of taraxacum." The plaintiffs averred that the defendant and his assistant were guilty of gross fault and negligence in their, or his, manner of dealing with a substance containing so dangerous a quantity of strychnine, and through that fault and negligence caused Mr. Lawson's death. Nux vomica and strychnine, they stated, are drugs which are very rarely—in fact, hardly ever—sold by chemists by themselves, and to the sale of them the provisions of the Pharmacy Act, 1868, and Acts amending the same, apply. In particular, by the Act 31 & 32, Vict., c. 121, sec. 17, and a resolution of the Pharmaceutical Society of Great Britain, passed in virtue of the provisions of that Act, druggists are prohibited from selling nux vomica or strychnine, except in boxes, bottles, or parcels distinctly labelled "poison." It was the duty of the defendant so to arrange his stock as to make it impossible that nux vomica or any other substance containing a dangerous quantity of strychnine should be delivered in mistake for any other substance. It was also his duty to employ an experienced and qualified assistant to take charge of the shop in his absence, and to inform him what poisons were kept in stock and where they were kept. He failed in all these duties. The defendant's assistant, for whom he is responsible, acted with culpable fault and recklessness in delivering nux vomica or a substance containing a dangerous quantity of strychnine, instead of taraxacum. The defendant had refused to make reparation, and the present action was necessary.

For the defence it was stated that the substance sold on the occasion referred to was solid extract of taraxacum, and it was explained that about the time of his death Mr. Lawson was in financial difficulties, and was being pressed very hard by his firm to clear off a large indebtedness which he had incurred to them amounting to several thousand pounds, but was unable to do so, being practically insolvent. Defendant denied that Mr. Lawson's death was due to any act or neglect of himself, or those for whom he was responsible.

Mrs. Lawson, widow of the deceased, gave evidence generally in support of the statements on record. She stated that when they went to Saltcoats on July 1, her husband took with him the stuff which her son Peter had bought in Christie's shop on May 28. On July 14 he had a recurrence of his liver complaint. During that day he appeared in good health until the afternoon, between six and seven o'clock, when they were sitting down to tea. He said then that he felt a little "livery," and he took a quantity of the taraxacum, about the size of a pea or bean. When he swallowed it he complained of the bad taste it had, and said he would not take any more of it. Very soon after he became ill with jerking and spasms. Two doctors were sent for, who gave it as their opinion that he was suffering from strychnine poisoning. Witness showed them the pot of taraxacum which her husband had taken a portion of before he became ill. They gave him something, but he died about three hours after taking the stuff. Her husband was of a cheerful disposition.

Cross-examined: So far as witness knew, her husband did not buy any taraxacum between May 28 and the day of his death. Her husband was not affected by business worries. He had no business worries that she was aware of. She came to know

that afterwards. She did not know the real state of her husband's affairs at the time of his death. As a matter of fact, he died owing about £8,000 to his firm of Dron and Lawson, and £3,000 to the bank.

Re-examined: After her husband's affairs were adjusted there came out a surplus of close on £900. Her husband was a religious man, and knew he was dying during the few hours that passed after he took the medicine. She heard him say to the doctors that he got the stuff from Mr. Christie's shop in Glasgow. Witness identified the pot in which the taraxacum was which her husband took. The hand-printed word "taraxacum" on the pot was written by her son, and the printed label on it was Mr. Christie's.

Peter Lawson, 16, said his father sent him to Mr. Christie's shop in Dumbarton Road for sixpennyworth of taraxacum on May 28. The assistant, whom he afterwards knew as Mr. Noble, said he had no solid extract of taraxacum, and he gave him liquid taraxacum in a bottle, which he said was better than the solid extract. His father sent him back with it, and then the assistant said he would look again if he had any solid extract, but he did not think so. He took some jars out of a cupboard, and having selected one of them, he brought it to the counter and served him. He did not remember if he weighed it. He told him he had not sixpennyworth, and gave him back 2d. It was a dark substance.

Cross-examined: It was not the case that he told the assistant for the first time that he wanted solid taraxacum when he took the liquid stuff back. He asked for solid taraxacum when he first went into the shop. The reason why he went back was to give back the liquid. His father told him he might have to go to another druggist's for it.

Witness on being shown two jars, one a little larger than the other, pointed to the larger, and said he thought that was the one from which the assistant took the medicine.

Counsel said that was the taraxacum pot.

Cross-examination continued: He went with his brother to Mr. Christie's shop on July 22, about a week after his father's death. Mr. Noble was there, but they had to go to Mr. Christie's Stobcross Street shop to see him. He also saw Dr. David Christie there. There was nothing said on that occasion about the size of the pot.

Mary M. Stewart gave evidence corroborative of what Mrs. Lawson, her sister, had stated with reference to the events of the afternoon of July 14 and the death of Mr. Lawson.

David Lawson, the deceased's eldest son, said he was an engineer employed by the firm of Dron and Lawson. He stated that when the two doctors came on July 14 they asked his father if he got any taraxacum in Saltcoats, and he said No, he got it in Christie's shop in Dumbarton Road, Glasgow. His father asked the doctors to explain what was wrong with him. On July 22 he went with his brother Peter to Christie's shop to explain the facts of his father's death, and that the medicine had been got there. They saw the assistant, in the Dumbarton Road shop. His brother recognised Noble as the man who sold the taraxacum to him on May 28. They went to the Stobcross shop and saw Mr. Christie and his son, Dr. Christie. Peter was not asked to say which of the two pots the assistant took the taraxacum from. Dr. Christie brought the two pots to show the resemblance of the pots. Witness had not told him then that his father died of strychnine poisoning.

Cross-examined: Witness had been self-supporting for five years. He had a salary. Witness would not say that Dr. Christie was anxious to show that his father had been poisoned by the stuff that came out of Mr. Christie's shop, but he was certain that

Dr. Christie brought out the two pots to show how they resembled each other, and not to ask his brother Peter what size of pot the stuff was taken from.

He could suggest no reason why he wanted to show that the stuffs were alike, except that witness did not buy any taraxacum for his father after May 28. He could not recollect being in a chemist's shop in Saltcoats, and he did not on the day of his father's death get a refill of the pot of taraxacum. Shown John Clark, assistant to a chemist in Dockhead Street, Saltcoats, witness said he had never seen him before.

John Ritchie Brown, M.D., Saltcoats, deposed to having been called in to see Mr. Lawson on July 14. He was lying on the floor when he got there. He answered all the questions put to him correctly. Witness was told that he had taken some medicine in the morning, but witness said if he had taken anything to do him harm it must have been something more recent than that. He was then told he had taken some taraxacum. Witness asked to see the pot in which it was, and found it contained a dark substance. The pot had a label with the name Christie, Dumbarton Road, Glasgow, printed on it, and the word "taraxacum" was written. He could not say that Mr. Lawson said he had taken taraxacum. There was a general conversation and confusion. They were all speaking, and he was speaking incessantly. He could not be positive if he gave any information. Witness was told in Mr. Lawson's hearing that he had taken some taraxacum. Shortly after Dr. Wallace came in witness drew his attention to the pot. Dr. Wallace tasted its contents, and he said it had a sharp, bitter taste. Witness did not taste it. They went into another room, and after a talk, arrived at the conclusion that Mr. Lawson was suffering from strychnine poisoning. They gave him a dose of bromide, but he died almost the moment he swallowed it. They took possession of the pot and the smeared knife with which he took the contents, and handed them to the police.

Cross-examined: The pot was only brought upon his suggestion that it must be something taken lately. It did not seem to have occurred to the family at first. Witness was then asked some questions as to the appearance of nux vomica and taraxacum, but he said he had not much experience as a dispenser of drugs.

Robert Wallace, M.D., who was also called in to see Mr. Lawson on July 14, corroborated the evidence of the previous witness. He was told it was just after the taraxacum was used that the attacks came on. He could not say positively that Mr. Lawson said so, but he heard it said. The pot was pointed out to witness. The stuff had an extremely bitter taste in his mouth for a considerable time after. Nux vomica and taraxacum extracts were very much like each other. The taste was the only way in which one could distinguish the two. Dr. Brown took the post mortem, but witness was present at it.

Cross-examined: The viscosity of nux vomica and taraxacum was much the same. It was not the case that nux vomica was more viscous than the other.

John Lawson, a divinity student, second son of the deceased, deposed that after his father was taken ill he sent him to a druggist's in Saltcoats for threepenny-worth of taraxacum. That was after he complained of being the worse of taking what he thought was taraxacum. He went for it to a chemist in Dockhead Street, and when he returned with it his mother sent him for the doctor.

Cross-examined: He did not know what was done with that taraxacum. He gave it to his mother in the lobby, when she told him to go for the doctor.

Mrs. Lawson, recalled and cross-examined as to why she did not say anything when she was first called

about the taraxacum which was bought in Saltcoats, said that Counsel did not ask her about it. He only asked her if any taraxacum had been bought between May 28 and the time her husband took ill. The taraxacum now referred to was bought after he took ill. She also said that no use was made of it, he being too ill by the time it was got.

Dr. Littlejohn, medical officer of health for Edinburgh, said he analysed a quantity of stuff in a pot which was handed to him by a criminal officer from Kilmarnock, and he found in it a sufficient quantity of strychnine to cause death. He reported the results to the Crown. Some days after he got two pots from the criminal officer, which he said were from the druggist's shop, and he instructed him to ascertain what the contents were. The contents of one was nux vomica, and of the other taraxacum. They were very similar in appearance. They could not be distinguished except by taste or the effects they produced. Taraxacum had no strychnine in it. He was aware of the recommendations issued by the Pharmaceutical Society of Great Britain as to the keeping of poisons in druggists' shops. The labelling and marking of a pot containing poison the same as another which was harmless would not be in keeping with those recommendations.

Cross-examined: The symptoms of strychnine poisoning were very well known. When he got the pot there was not more than two teaspoonfuls in it. That would be about a quarter of an ounce. The criminal officer said he got it from the Procurator Fiscal. None of it had been taken away by the Crown. He took out about 10 or 12 grains.

Counsel asked witness if he tried to find if there was anything else, and he said he wished to suggest that the stuff in the pot was really a mixture of nux vomica and taraxacum extracts.

Witness said that was quite consistent with anything he said. There was no absolute taste of taraxacum. He did not try to ascertain whether there was or was not taraxacum. There was no sugar in nux vomica but there was a considerable proportion in taraxacum. The presence of a large proportion of sugar in the mixture would be strongly indicative of the presence of taraxacum. Nux vomica had a remarkably bitter taste, the most bitter that he knew of. It would be absolutely impossible for a man to take nux vomica of the size of a pea or bean and not know at once that he had taken something very extraordinary. Supposing he did take nux vomica the symptoms would set in within ten minutes unless he swallowed it in a bolus, and then it might be twenty minutes. There was undoubtedly a difference between the viscosity of nux vomica and taraxacum.

Re-examined: The bitter taste of the strychnine would not necessarily be indicated until the strychnine was over the man's throat, especially if he took it in a bolus.

James H. Robertson, writer, Glasgow, the deceased's agent, gave evidence to the effect that his estate, after meeting his liabilities, amounted to nearly £900.

In cross-examination he stated that he appeared to be indebted to his firm to the amount of £8400, but his contention was that he should get one-third share of the profits, and in that case he would have had £4000 to the good. He also claimed that he should have had a larger share placed to his credit for wages because one of the partners had not been able to attend business. There was nothing to show that the contract of co-partnership had been altered except the conversation between parties. His claim was compromised by the deceased paying £4000 into the firm.

Re-examined: The original co-partnership had expired, and the question was whether they were going

on under the original contract, or whether it had been modified. Witness was able to ascertain from jottings in the hand of Mr. Lawson that he at least thought his claim was a large one, and that he was not indebted to the firm.

David A. Richmond, C.A., stated that an examination of the books of the firm of Dron and Lawson brought out that Mr. Lawson was due the firm £6486 13s. 1d. Mr. Lawson had drawn out of the firm from January, 1867, to June, 1893, averaging £391 1s. 7d. a year, besides the sum already mentioned, which was overdrawn.

Dr. Tattock, Glasgow, city analyst, said he had analysed a portion of the substance in the pot handed over to the Procurator Fiscal. His evidence was corroborative of that given by Dr. Littlejohn.

In cross-examination, witness said he did not try to find if there was anything else in the pot than nux vomica.

This closed the evidence for the plaintiff.

Alexander Noble was the first witness for the defence. He said he was a duly qualified chemist, and was licensed by the Pharmaceutical Society of Great Britain in January, 1893. He had been in practice in the trade ten years. He was assistant to John Christie in 1893, and was now in Carlisle. He left Mr. Christie's service because he got a better salary, and he left of his own accord. He had nothing to do with the buying of drugs. He just ordered them. The pots in Mr. Christie's shop were duly labelled on the side and on the top. He had no doubt that he supplied taraxacum on the morning in question. He heard nothing more about it till he heard of Mr. Lawson's death. When Dr. Christie came from the Stobcross Street shop and spoke to him about it he looked for the taraxacum pot and found it still empty, while in the other pot there was a quantity of nux vomica. He found the nux vomica pot in its usual place in the cupboard with the amount of stuff there was in it now. On the label of the nux vomica there was a small mark put there by the wholesale chemist, which showed that although it was a 2-ounce pot only 1 ounce had been sent. The week before July 22 he had taken out 133 grains to make a tincture with. That would be little more than a quarter of an ounce avoirdupois.

Cross-examined, witness said both pots were in the same cupboard but they were separated by other pots. These consisted partly of harmless and partly of dangerous drugs. The harmless drugs were on the bottom shelf and the poisonous drugs on the top.

Interrogated as to whether any of the recommendations of the Pharmaceutical Society as to keeping poisonous drugs were observed in this shop, witness said some of them were. In further cross-examination it appeared that the only recommendation observed was that the pots were distinctly labelled and kept separate. No taraxacum had been brought into the shop since February, 1888.

By the Lord President: He had never used taraxacum in that shop before. He had used the nux vomica frequently, and knew the pot quite well.

John Christie, the defendant, said he was a registered chemist, and had been in practice as such for thirty years. He had two shops. The deceased occasionally came to his shop, and used to bring bottles which had been supplied by other shops. Witness gave a statement as to the interview with David Lawson similar to that given by the latter.

In cross-examination he stated that within the last four months he had kept all poisons in his shop on a different principle than before that time. On being pressed, witness admitted that he had disregarded the recommendations of the Pharmaceutical Society,

but said they had to fit up their premises to suit their business.

Dr. Chrietie, son of the previous witness, also gave evidence.

John Clarke, public analyst for the city of Glasgow, said he analysed a portion of the drug in the pot handed by Dr. Brown to the police. He found in that at the bottom 5 per cent. of strychnine or other alkaloid, and 4 per cent. in that on the sides of the pot. In pure extract of nux vomica there was 15 per cent. of strychnine. From that he drew the conclusion that this was not pure nux vomica. He would say there was two-thirds of taraxacum and one-third of nux vomica in the pot. The test that could be applied was by adding bicarbonate of soda. Bicarbonate of soda added to nux vomica made no difference, but added to taraxacum it changed the colour. The large proportion of sugar he found would be accounted for by the presence of the taraxacum. There was a difference in the viscosity of the two drugs. If the deceased drew off nux vomica from a knife with his teeth it would stick to his teeth, and the bitter taste of the nux vomica would be felt.

Cross-examined: 15 per cent. was laid down by the Pharmacopoeia as the alkaloidal strength of nux vomica. It was an arbitrary rule. Witness did not suppose the deceased could have rolled the nux vomica into a bolus and swallowed it. It was so sticky that he would have to roll it with flour.

Mr. Nisbet, one of the examiners to the Pharmaceutical Society, who conducted the analysis along with Mr. Clark, concurred in his evidence.

Malcolm Kerr, assistant in a chemist's shop in Dockhead Street, Saltcoats, said he sold 3d. worth of taraxacum to David Lawson on the day of Mr. Lawson's death. Although that was the only time he had seen David till that day, he was quite certain it was he that he sold the drug to. He had never seen John Lawson before.

William Dron, engineer, said he was now sole partner of the firm of Dron and Lawson, engineers, Glasgow. He had frequently had to speak to David Lawson about overdrawing his share in the profits of the business, and told him he would have to put some more money into the business or he would take steps in the matter. When Mr. Lawson died he was owing £6512 to the firm. When witness spoke to Mr. Lawson about overdrawing his share he never suggested that he was mistaken. He admitted it, and said if things were squared he would have nothing. He never suggested that he had more than a fourth interest in the firm. He never said to witness that he had a third share. Witness accepted £3000 because he could get no more. The bank held securities, and he could not get possession of them.

Cross-examined: He was not aware that his family got some £900 after everything was paid. It was surprising to him to hear that.

This closed the case, and Counsel then addressed the jury.

Judgment.

The Lord President, who was the presiding judge, in charging the jury said the case was not a plain sailing one, but required careful attention. Each of the pursuers was entitled to damages for the mere pain of losing a husband and father, if the defender was liable, but he questioned if they had lost so much by way of money as one might be led to suppose. The defender's counsel had indicated his willingness to take it that if nux vomica was sold by Mr. Christie, he would be liable. But the vital question of fact was whether the pursuers had made out that the stuff which Mr. Lawson took and died of was sold by Noble, the defendant's assistant. The burden of proof was

on the plaintiffs, and it was for them to make out their case and remove from the minds of the jury reasonable doubt as to the cause of death. He pointed out that Mr. Lawson did not immediately on purchasing the drug partake and die of it. The stuff was purchased on May 28, and death took place on July 14. The pursuers' case was that pure nux vomica had been supplied, but when the remains of the stuff were examined it was demonstrated that it was not pure nux vomica and there was evidence that the other ingredient was taraxacum, that bore upon the case at this point. The pursuers had to prove by satisfactory evidence the identity of the thing sold with the thing swallowed. His Lordship further pointed out that apparently the suspicions of the family did not at once fall on the taraxacum, because when the doctors asked if Mr. Lawson had had any medicine, it was only after some delay that they mentioned the taraxacum. Mr. Lawson's conduct at the time of his death would certainly lead to the belief, so far as the evidence went, that he had a good conscience, and his belief was that death was caused by Christie's stuff. It was a great pity that that part of the plaintiffs' case was not corroborated rather than slightly contradicted. His Lordship reminded the jury that there was evidence that a fresh supply of the stuff was brought into the house on the day of Mr. Lawson's death, and concluded by saying that if the jury thought they had not got to the bottom of the case, if they thought that reasonable loopholes were open for the supposition that other drugs were put into the jar for this man's use, then he did not see how they could find a verdict for the plaintiffs.

The jury retired, and, after being absent for fifteen minutes, returned with a unanimous verdict for the defendant. They were of opinion that the plaintiffs had failed to prove their case.

Counsel for the plaintiffs, Mr. Comrie Thomson and Mr. W. Campbell. Agents, J. and J. Galletly, S.S.O. Counsel for the defendant, Mr. Graham Murray, Q.C., and Mr. Salvesen. Agent, F. J. Martin, W.S.

POISONING CASES AND INQUESTS.

DEATH FROM ALKALINE POISONING.

Charles Cecil Jenner died at Brighton on Wednesday, December 19, from the effects of poisoning by an alkali. Verdict: "Poison was self-administered during temporary insanity."—*Morning Leader*.

AN OVERDOSE OF LAUDANUM.

Mrs. Stewart, aged 70, was found dead in a bedroom in her house in English Street, Dumfries, last week, death being due to the effects of an overdose of laudanum.—*North British Daily Mail*.

POISONING BY SULPHURIC ACID.

Patrick O'Connell, aged 3, died on Wednesday, December 19, at Ranelagh, from the effects of sulphuric acid, which he got hold of while straying through some washhouses or bottle stores of a public-house. Verdict: "Death from sulphuric acid poisoning."—*Irish Independent*.

POISONING BY MORPHINE.

Augusta Gounet, aged 40, died at Kentish Town on Thursday, December 13, as the result of blood poisoning, due to deceased's habit of injecting morphine into her arms. Verdict: "Death from blood poisoning, supervening upon the abscesses caused by the continuous injection of morphine."—*Morning Advertiser*.

POISONING BY CARBOLIC ACID.

Mrs. Cruikshank, aged 34, died at 104, Kennington Road, on Wednesday, December 19, from the effects of carbolic acid, self-administered. Verdict: "Temporary insanity."—*Star*.

Correspondence.

TINCT. MYRRHÆ, B.P.

Sir,—In answer to Mr. A. McKellar (*Pharm. Journ.*, Dec. 1, p. 460), I may say that my experience has been that tinct. myrrhæ cannot very well be prepared "by percolation without previous maceration." That is, I do not condemn percolation, but, instead of damping the myrrh, as I should certain other things, in the ordinary way, with a small amount of the menstruum, I should prefer to macerate in a distinct bulk, so as to dissolve out the soluble matter. I should then pour into a percolator, allow to drain, and finally wash out with more spirit. Damping the myrrh with only a small amount of spirit gives a tenacious mass, difficult to pack, and difficult to percolate. And putting dry, coarsely powdered gum into a percolator does not answer very well either, since spirit poured on never completely displaces the air. The soluble portions are readily forced downwards, but, from its viscid nature, the lower layer is not easily removed. Free channels through the more exhausted portions are formed, and the menstruum has a tendency to pass through them, since they offer less resistance.

H. W. JONES.

Coventry.

MEDICAL MEN AND MANUFACTURERS.

Sir,—Not long ago I happened to call at one of our leading houses, and while waiting overheard a conversation between one of the assistants and a customer who wished to purchase a bottle of Parrish's food. Question after question was asked and replied to with intelligence and in perfect good faith, but when at last the customer left the shop, knowing almost as much about the syrup as Professor Parrish could have told him, there was still a lurking misgiving about his manner which intimated that after all he was afraid he had been sold. I ventured to say that, though I was pretty used to this sort of scepticism myself, I was, nevertheless, surprised to meet with it in an establishment of such note. Said the assistant, "The British public just now welcome a falsehood; tell them the plain straightforward truth and they disbelieve you, tell them a big thumping lie, and the bigger it is the more readily they swallow and like it." Now it is quite easy to understand how the ignorant who believe all they see in print to be gospel may buy a box of pills because a glaring yellow board informs them it will cure all ailments, or a cough cure because their letter-boxes have been stuffed with testimonials, but what are we to say when men who have received a scientific training prove as credulous as the habitual swallower of so-called patent medicines. Dr. Notus indignantly appeals to the *Pharmaceutical Journal* against a system which we chemists know to be supported by, I think I am warranted in saying, a majority of his *confères*. Day after day we are sending all over the town for preparations ordered in prescriptions, preparations we often obtain with considerable trouble and expense, and which we know will never again be required. Ephemerical pharmacy is not a source of profit or pleasure to us, and we in our turn appeal to the medical profession to discourage by all means in their power a practice which cannot enhance their reputation. "Some people," said James Hinton, "can't see beyond their own noses." Is it not obvious that when these remedies have been introduced to patients they will speedily save their friends' guineas by recommending them in their turn? And, finally, the makers will only need to publish popular works on medicine, drawing attention to the value

of their goods as remedies, much in the same manner as our homoeopathic friends have already done, to still further affect the incomes of the very gentlemen who so rashly advertised them in the first instance. But I have little faith in appealing to future benefits; the defect which has rendered the practice possible is obvious, and arises from the defective training of the medical student. The old apothecary had at least a practical knowledge of pharmacy, and if drugs are of value, the medical training of to-day should include a thorough and practical knowledge, not only of drugs in general, but also of the varied preparations which are official and those which are in common use. In no other way will he be able to avoid the reproach that he is engaged "in pouring medicines of which he knows little into bodies of which he knows less"; in no other way will he be able to demonstrate that the noble profession of medicine rests on a firm basis, the basis of scientific knowledge.

PHARMAKOS.

Sir,—Having noticed an article in the Journal by I. G. Notus, M.D., re "medical men and manufacturers," I should like to express a few words on the subject. Would that all medical men entertained the same antipathy towards these so-called "specific nostras," but, alas! the call for them is daily increasing, as if the medical man was unable to prescribe such a wonderful combination, or doubts the ability of the qualified chemist. So long as medical men prescribe, or rather administer these bogus remedies, chemists are powerless to stop the sale of them, and they will daily increase in the market to the detriment of the patient, the doctor, and the chemist alike. But, unfortunately, medical men do not stop here, but order So-and-so's pills, So-and-so's pepain, liquid, etc., to the annoyance of the chemist, who surely is conscientious enough to manufacture as good an article at a more reasonable price for the patient. The extra time occupied in writing a proper prescription with suitable doses will surely repay the busy medical man in the end. Very often, too, the chemist is considerably out of pocket in getting these preparations—here we have dozens of them put aside so as not to vex the eye. A portion of a small bottle is ordered, and this is never wanted again—why? because the contents are not efficacious! The preparations live a short life, and die out altogether.

"FREETHINKER."

Answer to Correspondent, etc.

T. Dunlop.—You are not likely to find any record of such change, which exists only in the imagination of the manufacturer. You may therefore continue to rely upon the B.P. test with perfect confidence.

Books, etc., received.

HELBING'S MODERN MATERIA MEDICA. By H. HELBING. Pp. i.-vi., 1 to 295. Price 8s. nett. London: H. K. Lewis. From the Publisher.

BERICHT ÜBER DIE DREIZEHNTE VERSAMMLUNG DER FREIEN VEREINIGUNG BAYERISCHER VERTEKTER, DER ANGEWANDTEN CHEMIE, in Aachenburg a. m. 5 und 6 August, 1894. Pp. 63. Munich: Dr. E. Wolf, 1894. From the Publisher.

LES DROGUES SIMPLES D'ORIGINE VÉGÉTALE. By G. Planchon and E. Collin. Vol. 1. Pp. 805, illustrated, 30 francs the complete work. Paris: Octave Doin, 8, Place de l'Odéon. From the Publisher.

PROCEEDINGS OF THE KENTUCKY PHARMACEUTICAL ASSOCIATION FOR 1894. Pp. 143. From the Secretary.

ANNOUNCEMENT OF THE MISSOURI BOTANICAL GARDEN FOR 1894. Pp. 10. From the Director.

STATE BOARD OF HEALTH, MASSACHUSETTS. Twenty-fifth Annual Report. Pp. 812. Boston, 1894. From the Board.

THE MEDICAL PROFESSION AND FREEMASONRY. By Bro. R. F. GOULD, P.G.D. Pp. 171. Margate: Kebble's Gazette Office. From the Author.

Diary of the Week.

MONDAY, DECEMBER 31.

London Institution, at 4 p.m.

"English Cathedrals" (Illustrated), by Arnold Mitchell.

TUESDAY, JANUARY 1.

Royal Institution of Great Britain, at 8 p.m.

"The Electric Current working as a Heater" (Lecture III.), by Professor J. A. Fleming.

WEDNESDAY, JANUARY 2.

London Institution, at 4 p.m.

"English Cathedrals" (Illustrated), by Arnold Mitchell.

THURSDAY, JANUARY 3.

Royal Institution of Great Britain, at 8 p.m.

"The Electric Current working as an Illuminator" (Lecture IV.), by Professor J. A. Fleming.

FRIDAY, JANUARY 4.

Quekett Microscopical Club, at 7 p.m.

Exhibition of Objects.

SATURDAY, JANUARY 5.

Royal Institution of Great Britain, at 8 p.m.

"The Electric Current working as a Messenger" (Lecture V.), by Professor J. A. Fleming.

Notices to Contributors.

* * Advertisements must be sent to Street Bros., 5, Serle Street, Lincoln's Inn, W.C., and instructions respecting the transmission of the Journal to the Secretary—Mr. Richard Bremridge—17, Bloomsbury Square, W.C.; otherwise delay may be caused.

Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

To ensure accuracy, all chemical formulae, and scientific and proper names, should be written or printed with extra care; whilst if names of plants and animals are underlined, and generic names alone commenced with capital letters, much inconvenience will be obviated.

When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines—and, preferably, twice the required size—must be supplied not later than a week before the proposed date of publication.

COMMUNICATIONS, LETTERS, etc., received from Messrs. Bennett, Clarke, Cracknell, Elborne, Fisher, Harries, Hill, Howell, Lewis, Long, Ponthien, Orrell, Parker, Robinson, Russell, Smith, Walton.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JANUARY 5, 1895.

Editorial Department.

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1894.

BEFORE entering upon a retrospect of the pharmaceutical events of the past year, it will be useful to recall to mind the fact that, during the interval which has elapsed since the celebration of the Society's Jubilee, very important changes have taken place in the views entertained as to the Pharmacy Act, 1868, and its applicability for the purposes it was intended to serve. In consequence of judicial interpretations which some provisions of the Act have lately received, the need of amendment—once generally recognised—has been to a great extent done away with. Thus the effect of the decision in the *WHEELDON* case has been to give greater importance to legal qualification under the Act, both as a matter of public policy and as a means of protecting the interests of chemists and druggists. In like manner the more recent interpretation of the provisions relating to the sale of poisons has now given them an application without which the Act would have no rational significance for the public or for pharmacy. The satisfaction to be derived from these circumstances is only mitigated by regret that they have not been brought about more largely by the initiative action of chemists and druggists, instead of being, to a great extent, the result of action taken by the Treasury in the first instance, and subsequently of outside pressure from coroners and the medical profession.

During the past year still further advance has been made in the same direction, though opposition—either active or passive—has been encountered even from within the ranks of chemists and

druggists, the Pharmaceutical Society being meanwhile regarded by three-fourths of those engaged in the trade as their natural enemy because of its power to enforce the Pharmacy Act.

In reviewing the progress of pharmaceutical affairs, it is, however, interesting to observe from year to year, indications of a growing tendency, among chemists and druggists, to revert to the views held by the founders of the Pharmaceutical Society, and by its earlier promoters, in regard to the main objects with which the Society was established. The necessity for qualification upon a sound educational basis, not only in the interest of the general public, but also as the means by which the material interests of chemists and druggists may be most effectually protected, is beginning to be more fully and more generally recognised. Comprehensive organisation and united effort have at least been recognised as needful for giving effect to that fundamental principle. But, side by side with the development of these opinions, antagonistic influences have also come into existence. The necessity for proprietary qualification—held by the founders of the Society to be a condition essential for protecting the general interests of pharmacy—was practically sacrificed in 1868 by adopting, as the legal standard of qualification, the lower grade originally intended only for assistants. Opportunity was thus afforded for limited companies of unregistered persons to carry on the business. But the present sense of the injustice of that practice may be attributed to a conviction that the personal qualification of proprietors is a condition as indispensable for the due protection of chemists and druggists and of their interests, as the qualification of persons selling or dispensing poisons is from the point of view of public policy. The two requirements are, in fact, inseparable, except from a one-sided point of view, and such a mode of regarding the matter can only tend to the disadvantage of chemists and druggists.

Under existing conditions—while
PHARMACY the legal definition of pharmacy is
LAW. limited to the sale and dispensing of
 scheduled poisons, and while personal qualification of the actual seller or dispenser continues to be the only legal requirement,—the endeavour to give full effect to the provisions of the Pharmacy Act, 1868, is the only means by which the interests of the trade can be conserved. The work done in that direction by the Society during the past year has been productive of good results by the further settlement of questions relating to the application of the Act. One of the most important cases was the prosecution of a grocer in the Derby County Court for the sale of *POWELL'S* balsam of aniseed, a preparation containing, in one fluid ounce, one-tenth of a grain of morphine. The decision given by his Honour Judge *KENNELM DIXON*, was in favour of the Society, and in accordance

with the evidence produced on both sides, after long consideration, in which the devices of forensic sophistry failed to impress the judge in a contrary direction. Following the precedent already established in the *PIPER* case, the judgment declared that the sale of the preparation in question by an unregistered person, was not protected by the principle *de minimis non curat lex*, but was an offence within the Act.

This decision was appealed against in April in the Queen's Bench Divisional Court. After hearing the arguments of counsel for the appellants, and without calling upon counsel for the Society to reply, Justices CHARLES and BRUCE confirmed the decision of Judge KENELM DIGBY, as their only possible alternative. They also remarked that the question as to the poisonous nature of a preparation is unaffected by directions given to the purchaser as to doses, and that restraining incompetent persons from dealing in poisons is of much more importance than any inconvenience arising from restricting the sale of proprietary medicines.

A further appeal from that decision was heard before the Master of the Rolls and Lords Justices KAY and A. L. SMITH in July, with the result that, after long arguments on behalf of the appellants, the appeal was again dismissed, with costs. In the course of this case it was argued that a preparation in which the amount of poison was infinitesimal would not come within the scope of the Act. This argument elicited from Lord ESHER the remark that the Courts ought not to enter into the question of quantity, and that if there were any of the prohibited things at all in a preparation, it should not be sold by unqualified persons. In his judgment, also, he referred to the "infinitesimal argument," and defined the word infinitesimal as relating to a thing so small that the Courts would treat it as not existing at all. These judgments in the superior Courts have now effectually disposed of the question as to the applicability of the term "patent medicine" to articles which are not the subject of Letters Patent. They have also decided that the object of the Act was to prevent the sale of poisons by any but legally qualified persons—that poison mixed with other ingredients is still poison within the meaning of the Act—and that the principle *de minimis non curat lex* would apply only in cases where the Court could decide that a poison was not present.

Another case of prominent importance was the appeal against the decision in one of a series of prosecutions instituted in November, 1893, against unregistered persons acting as assistants in chemists' shops kept by medical men in Glasgow. These cases were decided in favour of the Society; but they were not mentioned in the retrospect of 1893, because a medical association in Glasgow had announced its intention of contesting the decisions, and the matter was to some extent *sub judice*. The appeal was

heard in the High Court of Justiciary, in Edinburgh, at two long sittings in the month of March, and in June judgment was given in favour of the Society.

The decision of the questions of law raised in this appeal was to the effect that while the holder of a medical qualification is exempt from the first fifteen sections of the Pharmacy Act, and can keep open shop or sell and compound poisons, that exemption does not extend to unqualified persons in his employ. It was thus shown that the Act applies to chemists' shops kept by medical men in the same way that it was shown by the *WHELDON* case to apply to shops kept by registered chemists.

The proceedings already mentioned, though of necessity instituted by the Society as the body empowered to take such action, have been undertaken, not merely on behalf of its members, but primarily in discharge of the public duty imposed upon the Society by the Pharmacy Act for the benefit of the community. That is the point of view from which the judicial decisions affecting the interpretation of the Act have been arrived at, and any advantage or disadvantage accruing to chemists and druggists, either directly or indirectly, has been a matter of secondary consideration. But in addition to the public service rendered by enforcing the provisions of the Pharmacy Act in regard to the sale of poisons, the members of the Society have been benefited by the correct interpretation of the Act, and with them all persons entitled to carry on the business of chemists and druggists have been equally benefited by the suppression of illegal practices.

PATENT MEDICINES.

The difficulty that has arisen in regard to patent medicines—partly from the exemption relating to them in section 16 of the Pharmacy Act, 1868, and partly from the loose popular application of the term "patent medicine" to articles which are not patented, being improperly associated with the terms of that section,—has now been to a great extent removed by the decisions as to the meaning of the term "patent medicines." But a further question has been raised by the attempt to secure immunity from the Pharmacy Act by patenting medicines containing scheduled poisons. If that proceeding were admissible, the facility afforded by the patent laws for obtaining patents would be an easy means of evading the law relating to the sale of poisons. The Council has therefore had to deal with this matter as mentioned in the Annual Report, and practically the principle has been established that the patenting of a medicine containing a scheduled poison would be contrary to public policy. On that ground the action taken in 1893 has been continued, and further applications have been made to the Court of Chancery for the revocation of several patents

recently granted for such medicines. Those applications have been successful; but since the patentees have again in each case consented to revocation of the patents in question, the decisions of the Court do not amount to an authoritative legal precedent, or finally dispose of the question as to the proper construction of the Act in this respect. From the revocation of these patents, it may, however, be inferred that, since the passing of the Pharmacy Act, the grant of Letters Patent for medicines containing scheduled poisons has been absolutely barred. That inference is supported by consideration of the provisions of the Pharmacy Act relating to the sale of poisons and to the exemption of patent medicines from those provisions. It is supported still more strongly by the proviso, contained in all Letters Patent, that they are *ab initio* void if they relate to anything contrary to law, or prejudicial to Her Majesty's subjects.

By these proceedings, therefore, substantial progress has been made towards securing an interpretation of the Act that would, consistently with its general object, prevent its provisions from being evaded under the apparent sanction of Royal Letters Patent. The applicability of the Act to medicines which were actually the subject of valid patents at the passing of the Pharmacy Act, would appear, from a common-sense point of view, to be equally clear; for all such patents have now expired, as well as the right to any privileges they conferred, including that of exemption from the provisions of the Pharmacy Act. In fact, the object of that exemption can only be regarded as that of affording just consideration for privileges which had been acquired previously, and were in existence for the duration of the patents then in force. In that sense, therefore, the exemption of patent medicines in section 16 of the Pharmacy Act has, in fact, now become practically obsolete and ineffective for any other purpose than that of demonstrating the present incompatibility of the statute law with the grant of a patent for medicine containing a scheduled poison.

However, systematic investigation of the applications for patents relating to medicinal preparations has now become necessary for the purposes of the Pharmacy Act, and in addition to the duty devolving upon the Registrar in regard to ordinary cases of infringement of the law, he has now to scrutinise the work of Her Majesty's Patent Office in order to prevent evasion of the Act by that means. Up to the present time no less than 109 applications for patents for medicines have been investigated with that object. Of these 17 have been abandoned by the applicants on being apprised of the intention of the Council to oppose, in 54 instances the specifications did not disclose anything contrary to public policy, 22 cases are still being watched in their progress, and, in 6 instances where patents

were actually granted, applications for their revocation have been successful on the ground that the patents would have been conducive to infringement of the law in regard to the sale of poisons.

ADMINISTRATION Throughout the year the General Purposes Committee of the PHARMACY ACT. Council has been engaged in the consideration of some 400 cases in which infringements of the Act have been reported. As a consequence, a very large number of prosecutions have been instituted, and the monthly reports presented by the Society's solicitors have shown that in most instances the penalties incurred have been paid without trial. In several cases that has not been done until the last moment, when all provisions for the hearing in court had been completed; and the expenses so incurred have been considerably in excess of the penalties paid. The administration of the Act by the Council on behalf of the Society, being, however, in the main a public function which must be exercised when the facts of a case show that action is requisite, the attendant expenditure is a contingency which must be provided for from the private funds of the Society. Action so taken to enforce the law is not only of direct benefit to the public, but is also indirectly beneficial to the entire body of registered chemists, whether connected with the Society or not. Three-fourths of the chemists actually in business on their own account participate in the benefits derived from the administration of the Act without contributing to the Society either financial or moral support.

EXAMINATIONS. One of the most important parts of the public work carried on by the Society is the conduct of the examination required by the Act for admission to the Register of Chemists and Druggists. Various improvements which have recently been adopted, partly at the suggestion of the late Government visitor, have already increased the efficiency of this examination, a result which is no less important for safeguarding the interests of chemists and druggists than it is for the protection of the public. Similar improvements have also been introduced into the voluntary examination for admission to the ranks of pharmaceutical chemists.

According to the report presented to the Council by the Registrar in February, the total number of candidates for the Minor and Modified examinations in England, Wales, and Scotland, during the year 1893, was 1198; the percentage passed, 39.39. The number of candidates for the Major was 152; the percentage passed, 45.39.

The report presented to the Privy Council for the year ending in March, 1894, by Dr. STRVENSON, as Government Visitor of the statutory examinations conducted by the London Board

of Examiners, was laid before the Council at the meeting in April. Generally, the report stated that year by year steady progress is being made towards the desirable result of securing, with advantage to the public, more chemists and druggists having scientific and practical knowledge.

So far as public interests are concerned that report was as satisfactory as previous reports have been. But in regard to the present condition of pharmaceutical education, the reference to details is less satisfactory. In speaking of the elementary, First examination and of the "lamentable deficiencies" of those presenting themselves for it, to which attention had been directed in previous reports, satisfaction was expressed that while the proportion of candidates who passed had increased from 47.5 to 51.4 per cent., the number of failures in arithmetic had also diminished one-third.

The results of the examination for qualifying as a registered chemist and druggist were reported to be practically unchanged in regard to the proportion of passes (34 per cent.), and from careful inquiry into the numerous instances of deficiency in chemistry and practical laboratory work, they were found to be the result of defective training.

In the Major examination the percentage of passes (46.4) was reported as showing an increase of seven per cent. over the previous year, but without sacrifice of thoroughness in the examination. Here again, however, deficiency in chemistry and physics was the chief cause of failure.

According to the report of the Executive of the North British Branch of the Society, the proportion of passes in the Minor examination at Edinburgh, during the year ending in March, 1894, was 40.25 per cent., and in the Major examination it was 30.77.

The result of the Minor examination generally during the whole of the past year has been but little different, the proportion of passes being 37.13. It follows, therefore, that even if the stringency of the examination has been increased, as well as its efficiency for the purposes of the Act, the candidates have either been better prepared or they have had a better opportunity, under the new regulations, of showing their fitness to be placed on the Register of qualified chemists and druggists.

In the Major examination a similar result has been shown, the percentage of passes being 50.34. In both cases, therefore, the change appears to have been distinctly to the advantage of the candidates, though, at the same time, the defects of pharmaceutical education are proved by the very large proportion of failures in both examinations.

The result of the First or Preliminary examination still continues to point to the existence of very unsatisfactory conditions. The number of

candidates during the year 1893 was 1489; the percentage passed, 49.63. During the past year there have been 1541 candidates, and the percentage passed was 48.88. If the proportion of failures in this examination applied to youths about to enter the business as apprentices, the result might be regarded as satisfactory, in so far as it showed that undesirable persons were prevented from entering the business. But that is not the case. The persons who fail in this preliminary examination are, for the most part approaching, and sometimes beyond, mature age; they have already been engaged in the business for several years, and the present defective position in regard to this examination, provides a back door by which entry to the business is unduly facilitated to the incalculable detriment of registered persons.

From the report presented to the
THE COUNCIL by the REGISTRAR in February, showing the condition of the Registers of chemists and druggists, and of pharmaceutical chemists, as well as the strength of the Society for the year 1893, it appeared that the additions to the Register of Chemists and Druggists during the year were 497, while the deaths and erasures were together 219, showing an increase of 278 registered persons. At the end of the year the number of names on the Register was 14,798. Out of the whole number 2286 were pharmaceutical chemists; 2250 were members of the Society, 2562 associates, and 811 students. One consequence of making the Minor qualification the basis of registration under the Act of 1868, has been a rapid increase in the number of associates of the Society. By that means the existence of the class of chemist and druggist members has been practically revived and continued instead of being gradually superseded by pharmaceutical chemists, as originally intended, and as was desired and anticipated even in 1868. The number of associates has now become considerably larger than that of members, but they are not eligible as members of Council, and it has long been thought that under existing conditions they should be placed on the same footing as chemist and druggist members. Assuming that out of the whole number of persons unconnected with the Society some 4000 were in business before 1868, there must be more than 5000 registered since then who have not joined the Society. This abstention is perhaps partly due to the disability attaching to associates, and, from the point of view of trade federation, it has become evident that all persons possessing legal qualification should be entitled to stand upon an equal footing in regard to their connection with the Society. This, however, is a matter affecting the constitution of the Society, and the action taken in regard to it is referred to in another part of this article.

WORK OF THE COUNCIL. Besides the transaction of usual routine business, the Council has been occupied during the year with various matters of special importance. At the January meeting the presentment of a jury, communicated by the coroner at Ipswich, to the effect that white precipitate should be included in the first part of the poisons schedule, was considered, and it was decided not to be desirable. Communications from the Privy Council relating to the use of specially shaped bottles for poisons, the sale of vermin killers at oil shops, and of other poisons by photographic dealers, were considered at the February meeting, and replies were sent stating that provision is made for dealing with infringement of the Act in these respects, but that specially shaped bottles were not considered likely to effect the object desired.

At the meeting in March it was decided not to attempt the formulating of a code of ethics in accordance with the suggestion submitted to the Council by the Chemists' Assistants' Association. The objection to the proposed code of ethics was mainly based upon the difficulty of exercising the power to strike a person off a register on which it is legally necessary for the practice of his calling that his name should appear. That has been shown by the proceedings under the Medical Act, and the difference in the case of solicitors is to be ascribed to the fact that it is out of regard for damage to the public a solicitor is struck off the Rolls, and not on account of improper conduct damaging only to members of his own calling. If the right to practise a calling be not affected by exclusion from an official register, the controlling influence of the power to exclude will not be of much account, unless there be a strong bond of union among the members of that calling, and the moral force of public opinion among its members is equally potent. Where those conditions exist, as at the Bar, they supersede the necessity for power to strike off a register.

Another subject discussed by the Council was the system of awarding school class prizes which had been suggested by Mr. SCHACHT with the object of assimilating the practice of the Society to that adopted by universities and colleges, of classifying students according to the character of their work instead of giving a number of prizes which might all fall into the hands of one or two conspicuous individuals. The chief objection to Mr. SCHACHT's proposal was based on the fact that entry for the examinations is optional, and that the Society's School does not yet, in regard to its examinations, resemble a university in granting, on the basis of a curriculum, degrees for obtaining which examination is a necessity. Considerable sympathy with the idea of Mr. SCHACHT's scheme was expressed by several members of Council, and, while its impracticability

under existing conditions was recognised with regret, hopes were expressed that, under suitable conditions, such a system might eventually be adopted.

At the same meeting it was decided, on the recommendation of the School Committee, that students connected with the Society should be permitted to compete more than once for any one of the prizes offered at the end of each course of instruction attended by them in the School, but that no student should be permitted to take the prize in any class more than once. This reversion to a previous condition of things was adopted as the result of continued effort on the part of Mr. ALLEN, his object being to remove any obstacle to attendance at the classes, and to increase the inducements for apprentices to enter the School.

Another important item of the business transacted at the April meeting of the Council was the discussion and ultimate adoption of a draft Bill for the amendment of the Pharmacy Acts. Its chief object was to render every registered chemist and druggist eligible as a member of the Society, and to modify the provisions of the Society's Charter as to the mode in which members of the Council retire from office annually. In restricting the Bill to these constitutional alterations, requisite under existing conditions for the consolidation of the Society, the object was to eliminate any possibility of opposition arising, either from differences of opinion among chemists, or from apprehension of interference with public interests.

At the first Council meeting in May a resolution passed by the Western Chemists' Association of London was presented, expressing general approval of the draft Bill, but suggesting that the proposed limitation of the number of members of the Council, not on the Register of Pharmaceutical Chemists, was undesirable, as being likely to affect injuriously that unity which is so essential. This communication was referred to the Law and Parliamentary Committee for consideration. Mr. R. A. ROBINSON, subsequently gave notice that he would bring forward a motion on the subject at the annual meeting of the Society, and it then gave rise to a long and animated discussion. At this meeting of the Council, SIR FREDERICK ABEI, Bart., Professor SIDNEY RINGER and Professor REMINGTON were elected honorary members of the Society. Dr. GEORGE WATT, of Calcutta, and Professor RUSBY, of New York, were also elected corresponding members.

At the Council meeting in April it had been reported that out of seventeen persons nominated as members of the new Council, sixteen had signified their willingness to accept office. The new candidates were Mr. BATESON, of Kendall, Mr. CAMPKIN, of Cambridge, and Mr. GOSTLING of Diss. At the election in May thirteen of the members of Council who had retired were re-elected, and the

vacancy created by Mr. MARSHALL LEIGH not offering himself for re-election, was filled by the election of Mr. GOSTLING.

At the first meeting of the new Council in June Mr. CARTEIGHE was again re-elected President—a tribute to the conspicuous ability and zeal evinced during a succession of years in directing the onerous work of the Society. Mr. CROSS was re-elected as Vice-President, and Mr. HAMPSON as Treasurer, Mr. RICHARD BREMERIDGE being reappointed Secretary and Registrar. On the recommendation of the General Purposes Committee it was decided not to make an official representation to the Government in regard to the subject of the increased duty on spirit, upon which communications had been received from the chemists of Burnley and from Mr. CARLTON of Peterborough. A report of a General Purposes Sub-Committee on the method of conducting the Society's examinations as compared with the methods adopted by other bodies was presented, with recommendations as to various rearrangements of details, and the appointment of examiners engaged in teaching chemistry and botany. After a long discussion the changes recommended were adopted, and it was resolved that they should come into operation at the end of the year.

At the meeting in July a motion was brought forward by Mr. MARTINDALE in reference to the use of metric weights and measures, suggesting that after January, 1895, practical knowledge of the metric system should be required in the subjects of prescriptions and dispensing in the Minor examination. In the discussion of this subject considerable difference of opinion was evinced, and it was eventually resolved that the Boards of Examiners should be requested to consider the desirability of adopting Mr. MARTINDALE's proposal.

At the next meeting of Council, in August, the PRESIDENT reported that the Boards of Examiners did not consider that, in addition to the practical acquaintance with the metric system already required in the chemical part of the Minor examination, further practical examination in posology or dispensing by that system was desirable at present, and a resolution was passed to that effect.

The special business before the Council at the meetings in October and November, has been dealt with in other parts of this article. At the December meeting a suggestion made by the Chemists Assistants' Association as to the provision of post-graduate courses of lectures and laboratory demonstrations, was brought forward, and on the recommendation of the Committee, by which it had been considered, it was decided that the scheme suggested could not be adopted, though the Council would be willing to assist in promoting higher education if a desire were expressed on the part of a sufficient number of pharmaceutical chemists. The recommendations of the General Purposes

Committee and of the Executive of the North British Branch, in regard to the appointment of examiners for the ensuing year, gave rise to a long discussion chiefly in reference to a possible doubt as to the advisability of appointing to that office professors connected with the Society's School, all the members of Council being agreed on the principle of appointing teachers as examiners, and as to the fitness of those who had been nominated by the Committee. Eventually the recommendations were adopted, and the appointments were made.

The Scottish Executive and the NORTH BRITISH Board of Examiners for Scotland BRANCH. have continued their work in promoting the objects of the Society, and the Chairman of the Executive, Mr. LAIDLAW EWING—re-elected to that position last July—has been actively engaged during the year in superintending the construction of the Society's new premises in Edinburgh, the official opening of which by the President was celebrated at the end of October by a *conversazione*. On that occasion the members of Council accompanying the President and the Secretary were entertained at a dinner, given by Scottish pharmacists, at which many distinguished persons were present, and highly complimentary opinions were expressed as to the beneficial influence of the Society's labours to advance pharmacy and promote the interests of those engaged in the calling.

The discussion of chief importance on this occasion was in reference to the proposal to abolish the distinction between pharmaceutical chemist members of the Society and chemist and druggist members, in regard to eligibility to serve on the Council—a motion to that effect being brought forward by Mr. ROBINSON, and seconded by Mr. URWICK. The argument used by both was that in regard to the constitution of the Society as a representative body, the legal position of pharmaceutical chemists had been so altered by the Act of 1868, that the reason for their preponderating representation on the Council has ceased to exist. The discussion on both sides was, however, more largely influenced by sentimental considerations than by regard for that indisputable fact. That was the case with the argument in favour of equality, no less than with that as to the prerogative of pharmaceutical chemists. The tendency is towards the Society being chiefly constituted of chemist and druggist members; but its obligations under the Charter and the subsequent Acts, would not thereby become any less than if it were mainly composed of pharmaceutical chemists. The promotion of education, as well as the advance-

ment of chemistry and pharmacy, must always remain among its chief objects. Desirable as it is to protect to the utmost the rank of pharmaceutical chemists, it is probable that from the nature of things, and under the influence of various accidental conditions, they will continue to form a sort of inner circle within the larger community to which they belong. As suggested by Mr. EKIN the voting at the annual meeting cannot, however, be regarded as deciding a question of so much importance.

The other proceedings at the annual meeting of the Society in May were not marked by any unusual feature. In moving the adoption of the Council report the President described the litigation then in progress with regard to the interpretation of the Pharmacy Act, and discussed at length the various points which had been raised in connection with the sale of poisons. The subsequent discussion related mainly to the question whether the application of the Act to medicines containing scheduled poisons is limited by regard to the quantity of poison in them. Mr. LOMAS supported the view that if a poison were present, in any amount whatever, the preparation containing it would come within the scope of the Act. Mr. ATKINSON, on the contrary, evidently impressed by the consideration of quantity which has so unnecessarily complicated the cases brought before the Courts, was disposed to censure the Council for having in the DELVE case relied upon the mere presence of morphine in licorice as being sufficient, without proving the quantity present or the poisonous nature of the preparation. In doing so, he relied upon the judgment in the ARMSON case, in which Judge KENNELM DIGBY stated that he decided in favour of the Society, because the medical evidence given satisfied him there was a sufficient quantity of a scheduled poison in the bottle of balsam of aniseed to be fatal. But, while perceiving that the medical evidence had in that case assisted the decision of the judge, Mr. ATKINSON suggested that the importation of medical evidence was a mistake, because it might give rise to a conflict of opinion between rival toxicologists. The decision of Lord ESHER on the point of infinitesimal quantity had not then been given, and Mr. ATKINSON's argument involved the fallacy of assuming, as Judge HERWOOD had done in the DELVE case, that evidence of quantity is necessary for proving possible poisonous effect and bringing a preparation within the scope of the Act. That fallacy was pointed out by Mr. FLUX, who also showed that the Act entirely eliminates the necessity of proving either quantity or poisonous effect, by declaring that certain articles—to be sold only by registered persons—shall be deemed poisons within the meaning of the Act. The decision of Judge HERWOOD in the DELVE case was based solely upon the fact that the quantity of morphine was not

proved, and it involved the erroneous assumption that evidence as to quantity is necessary for proving the preparation in question to be poison within the meaning of the Act. The appeal against his judgment could not be heard, because he had found upon the question of fact, though it was not in reality material to the case brought before him.

In regard to the non-enforcement of the Pharmacy Act in the past, Mr. ATKINSON expressed the opinion that the Council was responsible for ignoring and neglecting the power conferred by the Act. He appeared, however, to overlook the fact that these powers are not conferred upon the Council, but upon the Society, and that while the Council, as its elected executive, has theoretically unlimited power of action in the exercise of State functions entrusted to the Society, its action in a representative capacity must necessarily be influenced by the prevailing views of the body it represents. In abstaining from such procedure under the Act as has recently had the effect of giving to the law increased significance, the Council has represented the general feeling of the Society and of the trade. Mistaken as we now know that feeling to have been, any reproach it merits does not lie against the Council, but against the Society and the trade. The invasion of the rights of chemists and druggists, which is now a ground of general complaint, has been a consequence of the too general reluctance to conform to the law and to seek protection by enforcing its provisions.

The Library in London has been fairly well attended during the year, the number of readers being only slightly below that of the preceding year. Most of the readers are students in the Society's School and in other schools of pharmacy in London, although members and associates also make occasional visits for purposes of reference. The number of books lent out has increased considerably, country borrowers taking a large proportion. About 250 volumes have been added to the Library, partly by purchase and largely through donations. These comprise medical and scientific periodicals, which are received regularly as published, and standard books, amongst which may be specified QUAIN'S 'Dictionary of Medicine,' GOULD'S 'Medical Dictionary,' CHAMBERS' 'Encyclopædia,' the concluding volume of WATTS' 'Dictionary of Chemistry,' KERNER and OLIVER'S 'Natural History of Plants,' FRANKLAND'S 'Micro-Organisms in Water,' CROOKES'S 'Select Methods in Chemical Analysis,' the 'National Dispensatory,' the 'Dispensatory of the United States,' a considerable selection from the library of the late Emeritus Professor BENTLEY, and other works. A new bookcase has been erected to meet the continually increasing demand for additional

space. In September the Librarian attended the annual meeting of the Library Association of the United Kingdom, held in Belfast under the presidency of the Marquis of DUFFERIN and AVA, at which papers of interest relating to library legislation and management, bibliography and literature, were read and discussed.

From the Library in Edinburgh there have been lent out upwards of 1300 volumes during the year, and there has been no falling off in the attendance. The library has been largely made use of by medical men and other persons to whom the Society is always pleased to offer facilities. The collection of books is growing rapidly, and the Council has added a considerable number of valuable standard works during the past year. The botanical department of the library has been specially enriched by a portion of the late Professor BENTLEY's library, these books having been already found a very useful addition. The shelf space in the present room is almost exhausted, but now that the examination work has been transferred to the new premises, it is intended that the present Board Room—which is admirably adapted for the purpose—shall be converted into a library, and that will add greatly to the comfort of readers.

During the past year the Society's Museum has furnished material for the publication of papers and notes which have cleared up several doubtful points

in materia medica, or have added to our knowledge of the medicinal properties and physiological action of plants. Dr. DE WEVRE's paper on cubebs (*Ph. J.* [3], xxv., p. 314) is perhaps the most exhaustive that has yet appeared on the subject, and the greater proportion of the work was done in the Museum of the Society. A new kind of jaborandi that appeared in commerce has been shown to be derived from a hitherto undescribed species *Pilocarpus trachylophus* (*Ph. J.* [3], xxiv., pp. 1065, 1066), and its comparatively little value, as compared with the Pernambuco kind, has been determined by Dr. B. H. PAUL from material supplied by the Museum. Dr. R. PFISTER, of Zurich, has published an excellent paper on the histology of the cinnamon barks of commerce, many specimens having been furnished by the Museum of the Society for the investigation (*Ph. J.* [3], xxiv., p. 941). Some leaves imported as a substitute for hops, which aroused considerable interest at the time both in England and on the Continent, were sent to the Museum for identification, and were proved, at the Kew Herbarium, to belong to *Piptocalyx moorei*, an Australian plant (*Ph. J.* [3], xxiv., pp. 977, 1044). Their bitterness was shown by Mr. J. C. UMNEY to be due to a glucoside. A British plant, *Leonurus cardiaca*, has been chemically investigated by Mr. NAYLOR (*Ph. J.* [3], xxv., p.

181), and attention directed to its therapeutical value (*Ph. J.* [3], xv., pp. 180–181). Dr. R. STOCKMAN, of Edinburgh, has demonstrated that prul root, aker lampong, and ipoh-aker, supplied by the Museum from material sent by Mr. L. WRAY, Jun., of Perak, are distinctly poisonous plants, and he has described their physiological action (*Ph. J.* [3], xxiv., p. 561). Mr. H. N. RIDLEY, M.A., of Singapore, has contributed a number of native medicinal plants (*Ph. J.* [3], xxiv., p. 969), two of which, *Ficus apiocarpa*, and *Vitex vestita*, appear worthy of investigation. The fruits of the former are said to be poisonous and the latter is used as an abortive. The properties of the genus *Vitex* have received less attention than they deserve, and they are comparatively little known, but appear to vary in different species, as in *V. agnus-castus* and *V. negundo*. *Clerodendron*, another genus of the *Verbenaceae*, is also worthy of investigation, several species possessing medicinal properties, and one of them, *C. siphonanthus*, is said by Mr. H. N. RIDLEY to yield the Biah leaves (*Ph. J.* [3], xxiv., p. 572), used in Perak according to Mr. L. WRAY, Jun., as a substitute for opium (*Ph. J.* [3], xxiii., p. 389–390).

Other work has been done by corresponding members and travellers at the instigation of the Curator. Dr. J. E. T. AITCHISON, F.R.S., now in Cashmir, has cleared up the uncertainty that existed concerning the collection of *Asafetida* from *Ferula narthex* (*Ph. J.* [3], xxv., p. 131). He has shown that in the district where the plant was originally found, none of the gum resin is collected for commercial purposes. He has also confirmed a previous supposition that *Ferula jäschkeana*, VATKE, and *F. fetidissima*, REGEL, are distinct plants (see *Ph. J.* [3], xix., p. 44). Mr. J. Medley Wood of Natal, has forwarded some of the poisonous plants of South Africa, and recorded their known properties, which in the case of *Combretum bracteatum* (the "hiccup nut"), and *Lichtensteinia interrupta* used as a remedy for colds, certainly seem worthy of further investigation (*Ph. J.* [3], xxv., p. 275).

The specimens of opopanax and sagapenum, etc., brought home from Persia by Dr. E. TREACHER COLLINS (*Ph. J.* [3], xxv., p. 404) have thrown fresh light on the hitherto almost unknown botanical origin and geographical source of these ancient drugs. Both the drugs were collected near Ispahan, and the opopanax in the fresh state is remarkable for its exceedingly powerful flavour of celery, which, taking into consideration the recent exports of this drug to Germany, must have been turned to account in commerce. The sagapenum, judging from specimens of an alliaceous plant received from Dr. COLLINS, is probably the produce of a species of *Ferula* nearly allied to *F. alliacea*, and perhaps identical with *F. rubricaulis*, but of which the leaves have not hitherto been collected.

Mr. J. WHITEHEAD, now travelling in the Philippines, has contributed a species of *Pittosporum* (*Ph. J.* [3], xxv., p. 34), which has been described in a recent number of the *Kew Bulletin* (1894, p. 344) by Mr. HEMSLEY as a new species. It is remarkable for the quantity of resin contained in the fruit, and has hence been named *P. resiniferum*. Mr. R. THOMSON, of Bogota, has presented, amongst other interesting drugs, an herbarium specimen of a new species of cinchona, *C. pombiana* (*Ph. J.* [3], xxv., p. 319), which is rich in quinine, and a curious bark belonging to a species of *Rhopala*, which should possess some interest for biologists and forestry officers, since it proves invulnerable to forest fires, which kill the trees around it. Its immunity is probably due to the large amount of mineral matter deposited in the bark in the form of raphides, so considerable, indeed, that since it was introduced to notice a few years ago in the *Gardeners' Chronicle*, no histologist has yet had the courage to ruin his razors in examining it. The life history of this plant, like that of the teak tree, and of the bamboo in which "tabashir" is deposited, should be of interest in solving some problems of vegetable chemistry.

As has always been the case since the *THE JOURNAL. Pharmaceutical Journal* was commenced by JACOB BELL, fifty-three years ago, chief prominence has been given, in its pages during the past year, to such subjects as experience has proved to be most essential, from a professional point of view, for the perfect development of the modern pharmacist. The mere retailer of drugs may feel no need of advanced knowledge in the different branches of science, the progress of which is regularly recorded in the official organ; but the true pharmacist, who can see beyond his immediate necessities, will never begrudge the time and effort required to keep himself thoroughly abreast of the science of the day. The working pharmacist has also been assisted in his daily round by the publication of descriptions of new processes, and alterations in old ones. The "Month" and the "Notes and Queries" column have contained novel information and suggestions of practical utility, while much assistance, of which little or no permanent record is presented, has been rendered in individual cases of difficulty. Readers have been kept fully informed of the current literature pertaining to their craft, and a recent departure has been the insertion of illustrated descriptions of novelties.

In the present issue of the *Journal* this matter and other items appear in a new form—the change having been rendered necessary by the growing demands for space—and it is hoped that readers may assist by suggestions and otherwise in rendering the "Supplement" of the

utmost value generally. Finally, with regard to students, the policy adopted has been to assist in their education more or less indirectly, not by the publication of special articles on elementary topics. In the "Students' Number" some sound advice was given concerning education during apprenticeship, and, as remarked at that time, the whole tendency of the *Journal* is educational, especially if considered from the point of view of what is "liberal" education in pharmacy. As instances of useful articles in this respect, reference may be made to the series on Practical Pharmacognosy; the papers on the Nomenclature and Formulæ of the Carbon Compounds, and on Systematic Botany; besides numerous reports and abstracts, such as those on Phosphorescence and Fluorescence, and Vegetable Ferments, and those of papers by LAUDER BRUNTON, BRAEMAR, EINHORN, MESNARD, and others.

SCHOOL OF PHARMACY. The endeavour to promote pharmaceutical education by maintaining a school where students can obtain sound instruction in the scientific principles on which the practice of pharmacy is based, has been continued as in previous years. The maintenance of the School and its extension, the Research Laboratory, has always involved considerable expenditure, and though the advantages thus offered cannot be shared by all students, it is much to be regretted that the number attending the School does not bear a much larger proportion to the total number of candidates for legal qualification. Of the necessity for thorough practical training for such an occupation as that of pharmacy there can be no doubt, and considerable expenditure of time on the part of students is, of course, necessary. Such thoroughness is especially aimed at in the Society's School, but, unfortunately, in the absence of any regulations enforcing a definite period of study, the tendency of students is to unduly shorten the period of attendance. The establishment of a Research Laboratory was an important further development of the Society's work in promoting education, and the opportunity for advanced study, now offered by scholarships in connection with it, should be a great inducement to students.

BENEVOLENT FUND. At the Council meeting in January, Mr. ATKINS referred to the satisfactory working of the regulation as to the reduction of annuities in cases where the circumstances of annuitants had improved. At the meeting in May, Mr. HAMPSON brought forward a proposal to discontinue the election of annuitants by vote, in which he was supported by Mr. YOUNG, Mr. SOUTHALL, and Mr. HARRISON, but after a long

discussion the motion to introduce this alteration was negatived. At the meeting in October it was resolved that four annuitants should be elected in December, and that three applicants should be added to the list of approved candidates.

WORK OF LOCAL ASSOCIATIONS. The proceedings of the various local pharmaceutical organisations throughout the country has been characterised during the past year by more than usual vitality. The Western Chemists' Association (of London) has increased its membership and extended its operations, so that it now fairly represents the whole of the metropolis. Its members have also continued to manifest deep interest in all questions of pharmaceutical interest, especially those affecting pharmaceutical policy, as instanced by the discussions on the subjects of federation and amendment of the existing pharmacy law. The Manchester Pharmaceutical Association has been particularly prominent in this connexion, the more important proceedings being the address delivered by J. RYMER YOUNG on the work of the Pharmaceutical Council, and the discussion on JOHN TAYLOR's more recent address. Sheffield has recovered a little of its accustomed vigour, and holds out the promise of once more taking a leading place in the van of progress. C. O. MORRISON's paper on pharmaceutical education in the provinces, a subject on which Sheffielders are peculiarly qualified to speak, attracted attention by the frankly-expressed heresies it embodied, and the delivery of the introductory sessional address by C. B. ALLEN afforded an opportunity of pleading for greater practical interest being taken by pharmaceutical students in the scholarships offered annually for competition. At the latest meeting held, some aspects of pharmaceutical politics were discussed. Both the Liverpool associations have continued to do useful work, the president of the senior organisation giving an instructive address at the beginning of the year.

The Three Towns and District Chemists' Association (Plymouth) has more than justified the expectations of its promoters, and papers of direct pharmaceutical interest have occupied the attention of both senior and junior sections. At Birmingham, JOHN BARCLAY contributed some useful statistics concerning the purity of saffron, F. H. ALCOCK dealt with the amount of extractive in infusions, and F. CASSON compared the strengths of various samples of extract of aconite. In the inaugural address by R. D. GIBBS, a number of subjects that might be profitably discussed were suggested; and in a paper on tincture-making, H. W. JONES, advocating more general use of percolation, described a new form of percolator devised by himself.

Nottingham pharmacists have been gratified by the continued success of their educational scheme, and have also discussed a paper on hindrances to

success, by R. D. GIBBS, and one on the federation of local pharmaceutical associations, by H. KEMP. Glasgow has also shown that the enthusiasm amid which its Association was founded and extended, as yet shows no sign of abatement. In addition to a number of scientific and practical addresses, political matters have been considered, and the annual supper of the Association was made the occasion for a presentation to ALEX. KINNINMONT, on his retirement from the Scottish Board of Examiners. The great event of the present session, however, has been the address given by the President of the Pharmaceutical Society, who was heartily received and sympathetically listened to whilst he explained the present position of affairs. At Edinburgh, the local trade association has dealt with difficulties arising in the administration of the Medicine Stamp Acts, and the new session was inaugurated with a capital address by PETER BOA, the newly-elected President. The Edinburgh Chemists' Association has, as usual, been favoured with a large number of practical communications, and has thus easily maintained its prominent position in relation to progress in the art of pharmacy. Amongst the more important papers were those on tincture of iodine, by C. F. HENRY, and on the dispensing of percentage prescriptions, by C. A. MACPHERSON; whilst several dispensing difficulties were dealt with by DUNCAN and others, and points of importance regarding pharmaceutical apprentices and assistants were raised in the inaugural address by ALEX. SUTHERLAND. The Edinburgh Pharmacy Athletic Club has also had a successful year.

Amongst the remaining organisations, the Chemists' Assistants' Association (of London) has been favoured with several papers of general, and a few of pharmaceutical, interest, in addition to some ambitious and immature attempts to deal with questions which are quite beyond the scope of the Association or the capacity of its members to discuss. As a training for public speaking the Association does well to encourage discussions and debates, but it is ill-advised in permitting such experimental efforts—mostly instigated by youthful fervour or a boyish desire for notoriety—to be published. The School of Pharmacy Students' Association, whilst doing equally if not more valuable work, is wiser in this respect, and the little weaknesses of its members are not betrayed in its periodical reports. Of the papers read, that by H. B. COX on tobaccos acquired a certain notoriety in the daily press, after publication in this Journal. Other useful communications were those on protoplasm, by ERNEST GOULDING; on aquatic plants, by C. E. ASHBY; on photo-micrography, by ARTHUR LANDER; and on capillarity, by T. TICKLE. Reports on current science were also sent in, and the opening address for the current session was delivered by R. HAMPTON, Treasurer of the

Pharmaceutical Society. The Cambridge Association has also held several meetings, at which useful papers have been read, whilst the Aberdeen, Bristol, Brighton, Leeds, and Sunderland Associations have met less frequently than others, and apparently been less anxious about occupying much space in announcing their doings to the world of pharmacy. In several districts where formal associations do not exist, social and other meetings have been held from time to time, and doubtless done much good by bringing the local pharmacists together on common ground for the time being. At Oxford, during the Conference meeting, delegates from various associations met to consider the organisation of the proposed federation, and appointed officers. This, however, is the extent of what has yet been done in the matter, though it is understood a code of rules is now under consideration.

BRITISH
PHARMACEUTICAL
CONFERENCE.

The subject of the presidential address at the Oxford meeting of the British Pharmaceutical Conference was the old one of medicine and pharmacy, but in expressing views that were the outcome of more than thirty years' connection with the sister arts, Mr. MARTIN was fortunate in avoiding any semblance of sameness or repetition. Commencing with a review of the present condition of pharmacy, he exposed the weakness of the position occupied by those who endeavoured to cast the onus of all deficiencies upon the Pharmaceutical Society, and plainly showed the extent of the evil caused by the development of the proprietary medicine system. The comparative failure of the Pharmacy Act of 1868 was attributed to the free registration, without examination, of all who claimed to have been in business as chemists and druggists prior to the passing of the Act. Many of those persons had been antagonistic to the educational standards of the Society, or had even actively opposed them. The baneful influence of the trade element in pharmacy was not likely to be readily nullified, and the outcome of it was that British pharmacists were attempting an impossibility—seeking to grasp commercial advantages and yet desiring to retain the rewards available only for professional services. Pharmacy as a trade was described as a failure, and, like the art of medicine, if conducted in the spirit of a commercial venture, deserved to fail. It ought to realise its privilege, and seriously take steps to accept its responsibilities as a profession. Proceeding next to deal with ways and means, Mr. MARTIN asked that the entrance examination should be rendered a more stringent test of intellectual powers and school training, and that this should be followed by a three years' actual apprenticeship and, later, by a two years' curriculum. Finally, the qualifying examination should attain the standard of the

Major, and successful candidates receive the qualification and title of pharmacist.

With regard to medicine, it was stated that no rigid line of demarcation between it and pharmacy is possible, and before medical men could be expected to relinquish dispensing, pharmacy must have acquired such a professional education and standing as will enable it to perform "its delicate and confidential function with the tact and reserve which is the outcome of prolonged training." Pharmacists made the mistake of expecting to receive the reward before making the necessary effort and becoming suitably equipped for their work. Prescribing by pharmacists must be strictly limited, so that there should be no rivalries or jealousies between medicine and pharmacy; and the better those who followed the two arts qualified themselves to exercise the duties devolving upon them, the more were they likely to respect each other's rights and work.

The papers subsequently read were up to the usual standard, the first being a note by FARR and WRIGHT, on the stability of the alkaloidal tinctures. This was based on the examination of specimens prepared during the course of their long and useful work, the results of which have been published from time to time. They stated that the strength of such tinctures remains approximately the same for a considerable length of time, and also gave the results of a comparison of gravimetric and volumetric methods for the assay of the tinctures. The qualities of a typical dentifrice were discussed by TURNER, LUCAS suggested a modified process for extract of *nux vomica*, RANSOM showed that the seeds of *nux vomica* are preferable to those of *Strychnos ignatia* for pharmaceutical purposes, and ELBORNE commented on the structure of the stems of *Gnetum*.

An important paper by PARKER dealt with the recovery of residual tinctures from marcs, and gave rise to a prolonged discussion. Some laboratory notes contributed by BIRD—treating of the use of potassium stearate in turpentine liniments, the quality of distilled waters, the preservation of syrup. hypophosph. co. B.P.C., and reprecipitation as a B.P. process—were as practically useful as experience has proved most of his published methods to be, and also aroused much interest, though the limited time available unfortunately prohibited anything like a thorough threshing out of the questions involved. In this connection it may be remarked that, whereas it may be a necessity under present conditions to economise time during the sessions of Conference, it does not seem advisable to effect this economy at the expense of practical matters.

Papers were also read on extract of malt with cod liver oil, and on the keeping qualities of certain samples of spirit of nitrous ether, by

JONES; an interesting dissertation on the natural features of the Oxford district was given by DRUCE; a comprehensive summary of information regarding animal extracts, by STUART; papers on *Leonurus cardiaca*, by HOLMES and NAYLOR; a contribution on the conditions of papain digestion, by RIDEAL; a recommendation of coco-nut stearin as the vehicle in suppositories, by THOMPSON; a suggested formula for phosphorus pills, by PARKER; a plea for the systematic adoption of known rules of Latin grammar in naming official remedies, by INCE; and a historical account of the cultivation of medicinal rhubarb in England, by USHER, which was supplemented by some facts of value concerning henbane. The shortness of the time allowed for the sessions of Conference was unusually marked on this occasion, a number of papers being taken as read. These included a compilation of notes of pharmaceutical interest concerning rhubarb, by PROCTOR; an explanation of the varying behaviour of tinct. ergotæ ammon. on the addition of water, by HORNBLLOWER; the recommendation of a soap basis for various official liniments, by LUCAS; reports on the assay of samples of tincture of iodine, and the calibration of pipettes, by LIVERSEEGE; a paper on Indian hemp and its extract, by HOOPER; and an exposure of some fallacies with regard to the testing of essence of lemon, by BARRETT.

The Oxford meeting may be described as a distinctly popular one. Being held just at the beginning of the autumn vacation, many leading pharmacists, who do not regularly attend on account of holiday arrangements, were enabled to take part in the proceedings. In addition to the time being propitious, the place of meeting was well chosen, and, doubtless, attracted many who had not previously been privileged to become acquainted with the city and its University. The rich variety of the architectural surroundings, with their old-time associations, proved a source of great gratification to the visitors, and also provided a fitting opportunity for a novel departure in the Journal, where an attempt was made to reproduce in slight degree a few of the innumerable beauties that adorn the historically interesting city of Oxford. The arrangements made to enable the members of the Conference to attend the meeting on a more independent basis than has been customary in recent years, also proved successful, and, as already mentioned in the Journal, the smallest towns possessing the requisite accommodation may now look forward to entertaining the Conference without being unduly burdened by the responsibility.

PHARMACY. ONE of the earliest and most important contributions in pharmacy, during the year, was the paper by Professor ATTFIELD on the proposed revision of the British

Pharmacopœia. This was written to explain the nature of some proposed alterations in the work, and with the desire to encourage pharmacists and others to assist in the labours of bringing it up to date from a scientific point of view and satisfactorily editing it. The main idea upon which the paper was based involves the extension of the Pharmacopœia so as to make it "imperial" rather than merely national in its scope. It has been pointed out, however, by later writers on the subject, that this end is virtually served at present, and that all that is requisite is to permit, in the various colonies and dependencies, the substitution of such medicaments and alternative formulæ as may have been proved more suitable for local purposes than those official in this country. Recommendations to this end from Australia have appeared in the Journal. Reference was also made by Professor ATTFIELD to the probability that pharmacists would be more directly recognised by the General Medical Council in the arrangements for the forthcoming revision. The whole question of revision came before the responsible authorities towards the end of the year, but nothing was definitely settled.

The annual report to the General Medical Council, on the progress of pharmacy in its relation to the revision of the Pharmacopœia, afforded a further opportunity of acknowledging the indebtedness of the official reporter to pharmacists throughout Great Britain. In the case of all articles or preparations specifically mentioned in the report, full credit was given, wherever due, to those who by their work or observations had aided in the solution of many of the numerous problems that continually present themselves in progressive pharmacy. Amongst the more general views put forward in the report were those bearing on the retention of manufacturing processes in the Pharmacopœia and the question of weights and measures. It appears probable that processes for the manufacture of definite chemical compounds will in future be replaced by extension of the statements of characters and of the tests to be applied. Official processes for galenic processes will still be retained, however, and with regard to weights and measures, it is proposed that formulæ shall be stated in terms of both the imperial and metric systems.

Some notes on belladonna preparations by NAYLOR confirmed SQUIRE's assertion that the B.P.C. process for making chloroform of belladonna is wasteful, and no improvement upon the original method of simple percolation with chloroform. The results of some supplementary experiments to those on liquid belladonna plaster referred to at the Nottingham Conference meeting were published at the same time, and a formula for the preparation was given. A paper on granular

effervescent salts by BRADLEY gave several useful hints, and a number of others were embodied in the laboratory notes contributed by LUCAS at an Evening Meeting in London. A practical instance of the utility of the application of aseptic and antiseptic principles in pharmacy was described in WHITE's paper on the preservation of infusions. The use of stearin in glycerin suppositories was recommended by HARDING; a historical account of the introduction of BLAUD's pills was contributed by INCE; the manufacture of wool-fat in America was described by BUSH; and a large number of notes of lesser importance have also been published. Articles have appeared on the new Swiss Pharmacopœia by JEHL, and on that of the United States of America by BERINGER. The former was described as being "worthy of modern science," and the U.S.P., though criticised somewhat severely, was commended for its advanced position—"at least a decade in advance of the scientific attainments of the average American pharmacist." The tendency on the part of many pharmacists to afford excuses to medical practitioners for dispensing medicines has been discussed by SHAW, whose list of grievances against the former rests on firmer ground than is desirable; the somewhat decadent position of pharmacy in Germany served as the text of a special article; and a general consideration of the condition of pharmacy abroad served as a useful contrast to the position of affairs in this country. Pharmaceutical education has also received special attention, the necessity of thorough early training and systematic technical instruction being once more emphasised.

PHARMACOGRAPHY.

During the past twelve months increased activity in the field of pharmacographic histology has been very prominent; an introduction to the histological study of drugs, which should prove useful to the student, has been furnished by a series of articles that have appeared in this Journal under the heading of "Practical Pharmacognosy." The anatomy of canella bark has been exhaustively dealt with by GREENISH, who has shown that commercial specimens are by no means so uniform in their structure as has generally been considered, young barks showing conspicuous sclerenchymatous fibres, the absence of which had been previously considered characteristic of canella, whilst older specimens may show a structure approaching that of cinna-modendron bark. The same worker has also identified an adulteration of veratrum root as that of an *Asphodelus*, and shown that structurally the two are practically identical.

PISTER has devoted much attention to the anatomical differences exhibited by cassia and cinnamon barks, and has embodied his results in an analytical table. Cubebs, which have always been a source of much trouble to pharmacognosists, have

been exhaustively studied by DE WEYRE, whose researches have thrown much light upon their anatomy, and indicated the substitutions that are likely to occur, as well as the anatomical characters by which they may be identified.

POHL has investigated the rhizome of *Hydrastis canadensis*, and described the localisation of the berberine, whilst OSENBRÜG has dealt with the development and structure of the seed of *Areca catechu*. HARTWICH has identified a false sarsaparilla by its structure as the root of a species of *Philodendron*, and similar considerations have enabled him to refer a gum resembling tragacanth to a species of *Sterculia*. Based upon identity of structure was MOELLER's opinion that Carthagena ipecacuanha is derived from the same plant as the sugary striated ipecacuanha, an opinion which is contested by HARTWICH, who refers the latter to *Psychotria emetica*.

The localisation of the proximate constituents of plants, especially alkaloids and glucosides, has likewise been the subject of investigation. In this branch BRAEMER has rendered valuable service by an interesting summary of previous researches, whilst CLAUTRIAU has provisionally classified them according to their distribution in the tissues of seeds.

TSCHIRCH and his pupils have continued their investigations, chemical and histological, on the secretions; the former has found that in all cases examined, oil or oleo-resin is secreted in the walls of the oil cell, or of the cells constituting the tapetal layer of the duct or cavity, not, as previously supposed, in the interior of the cell. CONRADY has proved galbanum gum-resin to contain much more umbelliferone than had been suspected, and suggests that it exists in combination with a resin-alcohol, whilst TROG has shown that balsam of Peru is a pathological product, the liquid portion consisting almost entirely of benzyl benzoate.

SCHWEINFURTH has rendered good service by determining the botanical source of myrrh. It is principally derived from *Commiphora abyssinica*, whilst *Balsamodendron myrrha* is entirely odourless, and yields no resin when incised. Ceará jaborandi has been ascertained by HOLMES to be the leaflets of a hitherto undescribed species of *Pilocarpus*, which he has named *P. trachylophus*; they are distinguished by their hairy undersurface. AITCHISON has thrown some light upon the geographical source of asafoetida, none of this drug appears to be collected in Kashmir. The same traveller finds *Ferula jäschkeana* to be celery-scented and distinct from *F. foetidissima* (see page 568). FRANCHET has been enabled to refer the glabrous *Strophanthus* seed of commerce to *S. (Roupellia) gratus*. MEYER and SANDLAND have drawn attention to the sophistication of loose kousso with male flowers, and LOWE has detected poke root mixed with belladonna. BASTIN

has examined the starch grains of cacao, ALESSI the means by which Martius yellow may be distinguished from the colouring matter of saffron, and BERINGER the solubility of podophyllin. BARKER has found *Pycnanthemum lanceolatum* to contain little else than volatile oil, whilst HOOPER has extracted from the leaves of *Abrus precatorius* a body apparently identical with glycyrrhizin, and from *Bragantia wallichii* an alkaloid. LEICHSNERING has re-investigated koussou flowers and isolated an amorphous highly-active body, kosotoxin, believed to be the active constituent. From *Aconitum lycoctonum* ROSENDAHL has obtained three alkaloids. The physiological action of Malayan arrow-poisons has been investigated by STOCKMAN, but the scantiness of the supply and the want of definite botanical identification of the specimens detract from the scientific value of the results. BOUQUELOT has found that several species of *Polygala* and one of *Monotropa*, indigenous in France, contain methyl-salicylic ether, or, at least, yield it readily when crushed, and BRANDIS has furnished an extremely interesting account of some medicinal products yielded by plants belonging to the natural order Dipterocarpaceæ, with special reference to Gurjun balsam.

BOTANY.

The year has produced a considerable amount of important work in vegetable histology and physiology. More and more attention is being given to the physiology of the simplest forms of plants and to that of the individual cell as a unit of construction of all plants. In this department a great deal of enquiry has been made into the question of karyokinesis or the mitotic division of the nucleus in the new light thrown upon the process by the discovery of the almost universal presence in animal cells of the "centrosphere" or "directing sphere," which seems to play such an important part in guiding the movements of the segments of the nucleus to their new positions. The work of GUIGNARD, indicating the constant presence of the centrosphere in plants, though accepted as far as regards the lower forms, is the subject of much controversy as far as the higher ones are concerned, many observers, though adopting GUIGNARD'S methods of work, failing to confirm his statements as to its presence.

The continuity of protoplasm through the cell wall, established long ago by GARDINER and others in the endosperm of many seeds and in the pulvini of certain Leguminosæ, and by other observers in many of the seaweeds, has again been the subject of a good deal of work. WAHRLICH has examined a great many of the fungi, with the result of establishing the fact of the existence of protoplasmic continuity between the vegetable cells, and also between the ascospores and the living

substance of the ascus. The means of communication is not, as in endosperms, a minute sieve-plate, but generally a single central pore, containing a strand of protoplasm of uniform breadth, usually granular in appearance. The pore appears to exist from the time of formation of the cell wall, and not to be, as in sieve-tubes, a new perforation. The discoveries of HICK and others as to continuity of living substance in the red seaweeds, have been supplemented by demonstration of the same fact in many filamentous Algae, including *Spirogyra* and *Ulothrix*. POIRAULT has discovered similar structure in the lichens, where minute channels are now found to exist in the cell walls of the hyphæ of the thallus and of the apothecia. Botanists will be gratified to learn that W. GARDINER has again taken up his researches into this subject.

In connection with the physiology of the cell several researches have been made during the year into the peculiarities of chlorophyll. Of these MONTEVERDE'S investigations may especially be noted. He finds that the alcoholic extracts of leaves contain two special pigments, carotin and xanthophyll, besides chlorophyll proper. The latter exists in two forms, one crystalline, the other amorphous, the first of the two being probably the form in which the colouring matter exists in living leaves. Etiolated leaves contain a modified pigment which the author calls "protochlorophyll," which, like chlorophyll, has a red fluorescence. It gives only two absorption bands in its spectrum, one corresponding to band iii. of chlorophyll, and another peculiar to itself towards the blue end of the spectrum. It does not exhibit the band in the red so characteristic of chlorophyll. ÉTARD, also working at this subject, advances reasons for supposing that several distinct varieties of chlorophyll exist in different leaves.

Some important investigations into gaseous interchanges between leaves and the atmosphere have recently been communicated to the Royal Society by BLACKMAN. By means of a very elaborate piece of apparatus, the author has been able to investigate and measure the interchanges connected with an isolated leaf. He comes to conclusions opposed to the view of BOSSANGAULT, that the gases absorbed from the air make their way into the interior by a process of solution in the cuticle, but holding that the stomata are more important than the latter in discharging this function. He holds, however, that they are rather passive than active in the work, only affording means of ingress to the delicate cells of the interior of the leaf, where solution takes place. The old idea that the stomata are the breathing organs of the plant does not receive much support from these researches, as BLACKMAN holds that respiration goes on fully in those parts which possess no stomata.

MAQUENNE has also been investigating certain problems connected with respiration, particularly with regard to the immediate source of the CO_2 exhaled. His results lead him to adopt the view that the living cell is constantly forming a combustible substance, which, by simple exposure to air, oxidises and gives off CO_2 .

The work on the localisation of the various active principles of plants, begun by GUIGNARD, has been extended by many workers, particular attention having been given to the alkaloids, several of which have been examined by CLAUTRIAU, BRAEMAR, and other investigators. In vegetable anatomy a very important paper has appeared by HARVEY-GIBSON on *Selaginella*, dealing with a large number of species of that genus, and showing that a much greater variety of structure exists than has hitherto been supposed. Important work has been done on the relations of the vascular cryptogams to the mosses and lower forms by DOUGLAS CAMPBELL, BOWEN, and others.

Two important works on the science have been offered to the scientific student during the year, one of which should receive a warm welcome from all lovers of natural history. This is an English translation or edition of KERNER'S 'Pflanzenleben,' brought out by Professor F. W. OLIVER, of University College. The work is written in a most charming style, and while going into minute questions of structure and function, yet presents the facts of vegetable biology in so simple a way that it needs no preliminary acquaintance with the technical details of botany to be fascinated by it. The illustrations in which the work abounds are in every way admirable. The other work is the first half of Professor VINES'S new text-book. This has recently been reviewed in these columns that no more than a passing reference to it is needed. It will supply a pressing need, containing as it does an immense amount of detailed information without being so bulky as many of the Continental text-books that have been hitherto the only ones available for students who have wished to pursue the subject beyond its elementary stages. It is hoped that that monumental work, the 'Index Kewensis,' will be completed and in the hands of the public during the ensuing year. The value of this work to those engaged in the study of systematic botany cannot be over-estimated.

CHEMISTRY. Progress in chemistry, though continuous, has not been marked by any startling developments, except the announcement by Lord RAYLEIGH and Professor RAMSEY that they have detected a hitherto unknown constituent of the atmosphere. Confirmation is yet wanting of this discovery, however, and chemists generally seem inclined to doubt its authenticity.

The results, such as they are, are the outcome of Lord RAYLEIGH'S observations on the density of nitrogen gas, in determining which he encountered some anomalous facts. At the Royal Institution the work of liquefying and solidifying the so-called permanent gases, and studying the characters of the resulting products, has been continued by Professor DEWAR, but hydrogen yet remains unconquered in its great elasticity. Chief amongst the phenomena studied at extremely low temperatures has been that of phosphorescence, and we have been fortunate in recording in the Journal a full and accurate report of an important lecture upon this subject.

Reports were current during the early part of the year that samples of glycerin in the market contained appreciable amounts of arsenic. As the result of the examination of a number of samples by PAUL and COWNLEY, the largest quantity of arsenic found in glycerin amounted to only one grain in fourteen pounds. FREUND and BECK arrived at the conclusion that aconitine is acetylbenzoyl-aconine, $\text{C}_{34}\text{H}_{47}\text{NO}_{11}$. They also disproved the statement that picraconitine (isaconitine) is an isomer of aconitine, suggesting for it the formula $\text{C}_{33}\text{H}_{45}\text{NO}_{10}$, and confirming the previous indication by EHRENBURG and PURFÜRST, that acetic acid is formed when aconitine is hydrolysed. DUNSTAN subsequently claimed priority in announcing that aconitine yields acetic acid when hydrolysed (see *Ph. J.*, 20 Jan., 1894), although the results of EHRENBURG and PURFÜRST were published some eighteen months earlier (see *Ph. J.*, 30 July, 1892). KRAFFT and ROOS observed that sulphonic alkyl esters are formed on mixing sulphochlorides with alcohols of the methyl series; MOISSAN prepared compounds of carbon with calcium and boron, respectively; BERTRAM and GILDEMEISTER investigated the composition of rose oil, and reconciled a number of discrepancies in the results of former workers.

BRAITHWAITE suggested that an official test should be based on the ash of sugar of milk, and that this should not be allowed to exceed 0.25 per cent.; the action of formic aldehyde as an antiseptic has engaged the attention of HOLFERT, SLATER, RIDEAL, SCHMIDT, and others, whilst purified cresol solutions were recommended for the same purpose by GRUBER. JOHNSON published some observations on superfatted soap, which were in part controverted by MOFFAT; the possibility of digestion without ferments has been discussed by DASTRE and BÉCHAMP; PAUL and COWNLEY have shown that *Ceará jaborandi* leaves contain no pilocarpine, though a small quantity of an amorphous base is present, which forms a crystalline nitrate; and some common sources of error in testing for sugar in the urine were pointed out by Sir GEORGE JOHNSON.

In addition to DEWAR's work, experiments on phosphorescence have been performed by JACKSON, and by PICTET; the chemistry of ipecacuanha has been investigated by PAUL and COWNLEY, who find that emetine is associated in the plant with another base named cephaeline, and that commercial emetine is a mixture of the two bases, whilst the probability was suggested that New Grenada ipecacuanha has a medicinal value, little, if at all, inferior to that of the Brazilian drug. The influence of alcohol on chloral hydrate has been studied by SCHÄR; HOLMES has summarised the results of the most recent work on the constituents of eucalyptus oil; and DUNSTAN and GARNETT have described two peculiar alkaloid-like bodies existing in *Piper ovata* (Piperacæ), and *Anacyclus pyrethrum* (Compositæ), which greatly resemble each other in chemical, physical, and physiological properties. The results of a large number of other researches of greater or less importance have been recorded in the Journal, and particulars have been published of many new synthetic remedies, the invention and recommendation of which together constitute one of the most striking features of the applications of chemistry in modern medicine.

Amongst the more important new publications that have been noticed is TSCHIRCH and OESTERLE's pharmacognostic atlas, an indispensable aid to all

who study the anatomy of drugs. GAMGEE's work on the physiological chemistry of the animal body was concluded, the new volume being, as described at the time, a model of what an advanced text-book should be. A monthly review of current scientific investigation, entitled 'Science Progress,' has been commenced, the numbers so far issued containing many papers of the first importance. SOHN's dictionary of the active principles of plants has proved as useful as anticipated, after making allowance for the manifest impossibility of making such a work all inclusive, and yet having it strictly accurate in every detail. The works by OLIVER and VINES already mentioned are valuable additions to botanical bibliography. One other publication on the same subject was, in the interests of students, awarded more prominence than it would otherwise have received. Such works are perhaps best passed over in silence, but, under the circumstances, it seemed desirable to impress upon students the fact that the essentials of an important science cannot be compressed within what would ordinarily be the limits of a single chapter. In making a further bid for popularity, SQUIRE's 'Companion' shows no symptoms of falling off, and is fast approaching the position of the larger dispensatories without the drawback of their extreme bulk. CARNEGIE's 'Law and Theory in Chemistry'; TRIMBLE's second volume on the tannins; the extension of SAWER's 'Odoro-

graphia'; PAVY's 'Physiology of the Carbohydrates'; NEWTH's text-book; and, above all, the concluding volume of WATTS' valuable dictionary, all form useful and welcome contributions to the ever-extending literature of chemistry. Another new work of importance is BRESTOWSKI's 'Handwörterbuch der Pharmacie,' now approaching completion; whilst among new editions, the chief have been QUAIN's 'Dictionary of Medicine'; PHILLIPS's 'Materia Medica'; INCE's 'Latin Grammar of Pharmacy'; the two large American dispensatories; and various hospital pharmacopœias. Numerous minor works have also been published or republished, and altogether, the British pharmacist has been well served in the matter of new books, though one or two gaps still remain on his book-shelves awaiting occupants as yet unknown.

DEATH ROLL Among the more prominent names OF THE occurring in the year's obituary has YEAR. been that of JOHN CARTEIGHE, brother of the President of the Pharmaceutical Society, who was at one time assistant to MICHAEL FARADAY, and, later, a partner in the firm of DINNEFORD & Co., New Bond Street. A former member of the Pharmaceutical Council also passed away in the person of W. D. Savage, of Brighton; a former member of the Executive of the North British Branch, William Pinkerton; three of the founders of the Society, JOSEPH BEECH, WILLIAM HOOPER, and EDWARD HORNER, a member of the Salter's Company; FRANCIS THIRKETTLE SILVERS, Divisional Secretary for Dulwich; GEORGE PATTISON, Divisional Secretary for Central Finsbury; CHARLES BATCHELOR, Local Secretary for Fareham; JAMES MARTIN, Local Secretary for Motherwell; WALTER SMYTH, Local Secretary for Merthyr; and CORNELIUS WILLIAMS, Local Secretary for Pembroke Dock. Other notable deaths have been those of Professor HELMHOLTZ, Dr. BROWN-SÉQUARD, Dr. ALDER WRIGHT, Dr. A. H. HASSALL, HENRY AYSOUGH THOMPSON, and, finally, towards the close of the year, FRIEDRICH AUGUST FLÜCKIGER, a highly distinguished Honorary Member of the Society, whose obituary notice appeared but a fortnight ago.

COMPARISON OF FILTERS FOR DOMESTIC USE.

IN concluding the first part of the account of their inquiry into the relative efficiency of water filters in the prevention of infective disease (*British Medical Journal*), Drs. G. SIMS WOODHEAD and G. E. CARTWRIGHT WOOD give a list of eighteen more or less well-known filters for domestic use, which, in their experiments, afforded no protection against the communication of water-borne disease. The three filters which did appear to afford such protection were the Pasteur-Chamberland, the Berkefeld, and Porcelaine d'Amiante. Where such filters are required their employment as tap or pressure filters is recommended.

R.C.M.P.C.V.S.

AN absurd instance of the abuse of the system by which qualifications are denoted by letters after an individual's name is recorded in the *British Medical Journal* for December 29. A bone-setter, against whom damages were claimed for slander, being asked in Court why he appended the letters R.C.M.P.C.V.S. after his name, explained them as standing for "Registered Chemist, Member of the Pharmaceutical Conference, and Veterinary Surgeon." For the credit of pharmacy it seems only fair to state that he appears to have been in business as a "chemist and druggist" prior to August 1, 1869; that is to say, he became registered without adducing proof of previous scholastic or technical education.

NEW YEAR'S HONOURS.

MEDICINE has been recognised in the distribution of New Year's honours by baronetcies being conferred upon Dr. J. RUSSELL REYNOLD, F.R.S., President of the Royal College of Physicians, and Mr. JOHN ERIC ERICHSEN, F.R.S., LL.D., formerly President of the Royal College of Surgeons. A similar honour falls to journalism in the person of Mr. GEORGE NEWNES, M.P., proprietor of the *Westminster Gazette*, 'Strand Magazine,' 'Tit-Bits,' etc. Mr. GARNETT, Keeper of the Department of Printed Books in the British Museum, has been made a Companion of the Order of the Bath.

PATENT OFFICE ORTHOGRAPHY.

ORTHOGRAPHIC errors continue, and appear likely to continue, fashionable at the Patent Office, and the compositors and proof-readers who work for Her Majesty's Stationery Office seem particularly weak in the nondescript variety of the Latin tongue employed in prescriptions. In the complete specification of Patent No. 15,525 (1894), recently accepted, JOHN WALLACE, an Irish barrister-at-law, declares the nature of his invention to be particularly described in and by the following statement:—

"R. Vini ipecacuanha.....3ii. min. x.
 Sirupi papaveris 3ii. min. xx.
 { Sulphatis quinae gr. ix.
 Solutæ in acido hydrochlorico
 quantum sufficit et aqua ad ...3ii. min. x.
 Camphoræ solutæ in spiritu rect.
 ad saturandum min. xxx.
 Fiat mixtura : percolare drops.

"Dose for influenza, x., xv., or xx. drops three times a day in a dessertspoonful of water, before a meal.
 "The same treatment should be followed for bronchitis, and for coughs.

"A single dose (which need not be repeated) will be found an invaluable remedy for an attack of indigestion, or for ailments of the liver or kidneys, or low fever."

What is specifically claimed by the Irish barrister-at-law in respect of this precious medicine is then declared to be: "(1) the combination of ingredients, and (2), the proportions of the same (? which) are novel and remarkable in their curative effects."

Transactions of the Pharmaceutical Society of Great Britain.

MAJOR EXAMINATION QUESTIONS.

BOTANY AND MATERIA MEDICA* (A).

December 28.—Hours from 10 a.m. to 1 p.m.

1. How would you distinguish between the following Natural Orders?

Solanaceæ and Scrophulariaceæ,
 Rosaceæ and Ranunculaceæ.

2. Give an account of the nature and distribution of glandular tissue in plants. In what plants and parts of such plants do we find *resin*, *mucilage*, *volatile oils*, *tannin*?

3. Describe the physical characters of official *Strophanthus* seeds. Mention substitutes that have appeared in commerce, and say how you would distinguish between them and the official *Strophanthus*.

4. The tip of a small seedling of Indian corn has a distinctly sweet taste. To what is this due? From what source and by what means has the sweet substance been derived?

5. Contrast a typical Vascular Cryptogam with a Moss. Give what you consider a convenient definition of the class Vascular Cryptogams.

6. What is the morphological nature of each of the following products?

Mace, Kola Nuts, Ergot, Lycopodium.

Give the geographical source of each.

BOTANY AND MATERIA MEDICA* (A).

December 29.—Hours from 2 to 5 p.m.

1. Describe in technical language the specimen B. Refer it to its Natural Order and Genus, giving the reasons for your assignment.

2. Examine the section of bark provided. Indicate by means of a lettered explanatory sketch the position of the several tissues seen in the preparation. Ascertain by means of micro-chemical tests what those tissues are, and write an account of the tests you apply, and their results.

3. What do you understand by *assimilation*, *respiration*, and *transpiration*? Give a brief account of the structure of a leaf, and point out how its tissues are adapted to each of these physiological processes.

BOTANY AND MATERIA MEDICA* (B).

December 28.—Hours from 10 a.m. to 1 p.m.

1. Describe in technical language the specimen B. Refer it to its Natural Order and Genus, giving the reasons for your assignment.

2. Examine the section of bark provided. Indicate by means of a lettered explanatory sketch the position of the several tissues seen in the preparation. Ascertain by means of micro-chemical tests what those tissues are, and write an account of the tests you apply, and their results.

3. What do you understand by *root pressure*? Give a brief account of the structure of the root, and show how it is correlated with this function.

BOTANY AND MATERIA MEDICA* (B).

December 28.—Hours, from 2 to 5 p.m.

1. How would you distinguish between the following Natural Orders?

Amaryllidaceæ and Liliaceæ.
 Compositæ and Dipsacæ.

* Part of the candidates received the papers AA, and the remainder had the papers BB.

2. Give an account of the nature and distribution of laticiferous tissue in plants. What substances are of most general occurrence in latex?

3. Describe the physical characters of official cubebs. Mention substitutes that have appeared in commerce, and say how you would distinguish between them and the official cubebs.

4. What chemical changes are associated with the process of germination? Explain them as far as possible.

5. Write the life history of a Moss. Compare the several stages with the corresponding ones in that of a Fern.

6. What is the morphological nature of each of the following products?

Cloves, Levant Galls, Guarana, Cinnamon.
Give the geographical source of each.

CHEMISTRY

December 29.—Hours from 10 a.m. to 1 p.m.

[Six questions only to be attempted.]

1. What is the constitution of the principal animal fats, and how are soaps obtained from them?

2. In what form does salicylic acid occur in nature, how is it artificially prepared, and how would you convert salicylic acid into paraoxybenzoic acid?

3. What are the principal alkaloids occurring in opium, and how is morphine separated from the rest? Give the names and formulæ of any decomposition-products of morphine with which you may be acquainted.

4. How can the following substances be prepared from benzene.—(a) benzoic acid, (b) phenol, (c) aniline, (d) benzaldehyde?

5. What are ethylamine and acetamide, and how are they respectively obtainable from ethyl alcohol? Indicate some of their more important properties and reactions.

6. How many lactic acids are known and what is their constitution, and how do they differ from each other in properties?

7. Distinguish between the terms *decomposition* and *dissociation* as commonly understood. Describe in detail any experiment illustrating the phenomena of dissociation.

8. A volumetric solution of sodium thiosulphate (hypo sulphite) is frequently standardised by means of potassium dichromate. 0.991 grammes of potassium dichromate were dissolved in water, acidulated with hydrochloric acid and mixed with excess of solution of potassium iodide. The iodine liberated was determined by means of the standard solution of sodium thiosulphate, and 20.9 C.c. were required. How much iodine and how much oxygen correspond to 1 C.c. of the standard solution? State precisely how the experiment should be performed, explaining by equations the changes which take place ($\text{Cr} = 52.5$).

9. What is a reversible chemical change? Give examples.

PHYSICS.

December 29.—Hours from 2 to 5 p.m.

[Six Questions only to be attempted.]

1. Give a full account of the way in which you would determine the vapour density of carbon disulphide by means of Hofmann's method.

2. Describe and explain all the phenomena attending the solution of sodium sulphate.

3. How would you experimentally determine the amount of heat liberated on diluting a given specimen of sulphuric acid with water?

4. Describe the construction of any form of polariscope, and indicate how it may be used for the quantitative estimation of cane sugar.

5. If 10 grammes of ice at 0° C. were mixed with 1000 grammes of water at 50° C. what would be the temperature of the mixture?

6. What is the principle of the induction coil? Describe arrangements for varying the power of the coil when it is used for medical purposes.

7. What is the principle of a constant battery? Illustrate the answer by examples of two or more forms of battery. What is a Clark's cell?

8. Two plane mirrors, each six inches square, are placed on a table with their surfaces vertical and with two edges in contact so as to form a right angle between their faces. A candle is placed a distance of one inch from the face of one mirror and two inches from the face of the other. Show by a rough diagram the paths of the rays and the position of the images seen by an eye looking towards the angle between the mirrors.

9. Give some examples of freezing mixtures, stating the principles on which they depend.

EXAMINATIONS IN LONDON.

January 2, 1894.

MAJOR EXAMINATION—PASS LIST.

Candidates examined.....	34
" failed	18
" passed	16

Alcock, J. E.
Dales, E.
Durbin, H. E.
Hoit, A. H.
Hope, R.
Ingall, S. H.
Marsh, A. E.
Massey, C.

Moffat, C. D.
Moorhouse, J. W.
Peach, C. W.
Pearce, J. H.
Perkins, Miss C. S.
Pickering, W.
Potter, H. A.
Taylor, C. J.

Proceedings of Societies in London.

THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

At a meeting held on Wednesday, December 19, 1894, the President gave an introductory address the substance of which is here published—

THE COMMERCIAL OUTLOOK OF PHARMACY.

BY R. H. PARKER.

After showing that evolutionary movement was the order of the universe, and that development of any species was the resultant of forces dependent upon its environment and its adaptability thereto, Mr. Parker indicated that pharmacists as a body are subject to the same laws, but have the infinite advantage of possessing conscious control of both. Regarding "human society" as an organism dependent for its vitality upon the supply of its requirements by groups of individuals (*e.g.*, pharmacists), he asserted that the onus of obtaining remuneration for that supply rested entirely on each group of individuals, and that "society" would remain utterly indifferent if pharmacists chose to supply such needs without demanding adequate recompense.

It was evident, therefore, that pharmacists were themselves to blame if they did not by united effort command such remuneration as would enable them to maintain a thoroughly educated and competent body of men to act as "dispensers of medicine." Three methods of doing so were alluded to. (1) By further parliamentary legislation. (2) By turning to account

of existing legislative power, and (3) By individual and collective efforts to raise the status of pharmacy.

In the direction of further legislation he believed that "company pharmacy" could not now be prevented, but might be counteracted by demanding that every dispensing establishment should be registered, together with its qualified *bond-fide* manager, who would be held responsible for the proper conduct of that establishment only, and whose name might be struck off the Register for misconduct; secondly, that all dispensing should be performed by qualified persons only; and thirdly, that the educational status should be raised by means of a compulsory curriculum.

Possibly, in order to secure the elevation of pharmacy, so as to attract to its ranks talented men, the best legislative powers would be entirely futile, unless qualified chemists themselves insisted upon the public recognition of the value of their qualification, and individually endeavoured to assert its dignity.

Mr. Andrews proposed, and Mr. Urwick seconded, that a hearty vote of thanks be accorded to the President for his interesting and valuable address; this was carried unanimously and with acclamation.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The following is the programme of the above Association for the latter half of the session 1894-95:—Jan. 9 (Wednesday). Smoking Concert at the Horse Shoe Hotel, Tottenham Court Road.

- „ 17. Paper, "Sophistication a Century ago"—J. S. Ward.
- „ 24. Paper, "Volumetric and Colorimetric Analysis"—W. H. Symons, M.D.
- „ 31. Short papers by Members.
- Feb. 7. Musical and Social Evening.
- „ 14. Paper, "Nostrums"—F. C. Long.
- „ 21. Paper, "Diatoms"—F. Ransom.
- „ 28. Short papers by Members.
- Mar. 7. Annual Dinner.
- „ 14. Paper, "The Pharmacist in Fiction"—A. C. Meyjes.
- „ 21. Paper, "Sanitation"—E. Goulding.
- „ 28. Short papers by Members.
- April 4. Musical and Social Evening.
- „ 18. Paper, "The Rational Pharmacist"—C. Morley.
- „ 25. Paper, "Essential Oils in their relation to (1) the British Pharmacopoeia, (2) to trade"—J. C. Umney.
- May 2. Annual General Meeting.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The usual meeting was held on Thursday, December 27. Mr. John McMillan, Hon. Vice-President, in the chair, when Mr. Alexander Boyd read a paper of which the following is a brief summary:—

THE PRESENT ASPECTS OF PHARMACY.

BY ALEXANDER BOYD.

The author first dealt with the counter prescribing question, from a historical point of view, the various Medical and Pharmacy Acts being briefly summarised in so far as they relate to the subject which, it was suggested, was not so great an evil as sometimes alleged.

The British Pharmacopoeia next received attention, the efforts of pharmacists to become recog-

nised in its revision being referred to, after which various proposed alterations were considered.

With regard to proprietary medicines, pharmacists were recommended to sell them at the lowest possible prices and to educate their customers to dispense with them entirely.

Recent judicial interpretations of the Pharmacy Act, 1868, were next commented upon, and, finally, attention was drawn to the continued progress in synthetic chemistry and the development of the animal materia medica now taking place.

Afterwards various speakers commented on several of the points raised by Mr. Boyd, and showed themselves in sympathy with his views generally.

A hearty vote of thanks was accorded.

Provincial Transactions.

CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

A meeting of the above was held on Friday, December 22, Mr. Alderman Deck, President, in the chair, and an interesting paper was read by Mr. A. Ivatt, M.A., Christ's College, on "Reasons why certain Drugs and Chemicals of the Pharmacopoeia deteriorate." At the conclusion there was an interesting discussion, in which Mr. Alderman Deck, Mr. A. S. Campkin, J.P., Mr. E. S. Peck, Mr. Cook, and others took part. A hearty vote of thanks having been accorded, the meeting closed.

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE MEDICINE STAMP DUTY ACTS.

SALE OF PROPRIETARY MEDICINES UNSTAMPED.

At the Plymouth Petty Sessions, on Dec. 27, before the Mayor and Messrs. H. J. Howland, E. Marshall, and J. Pillman, borough magistrates, Mr. Williams, chemist, Old Town Street, was summoned for supplying patent medicines which did not bear the Government stamp.—Mr. B. Hawkins, from Somerset House, London, opened the case, and referred to the action of the defendant in selling articles which should have borne the Government stamp.—Mr. G. Davis, supervisor of Inland Revenue at Plymouth, stated that on various dates he bought from defendant bottles of rheumatic sprain liniment, compound essence of horehound, squills, etc., compound of arnica, Dr. Hawker's pills, and Fellows' syrup of hypophosphites.—Defendant having pleaded guilty, Mr. Trehan, who appeared for Mr. Williams, pointed out that the articles were supplied by an assistant.—There were five charges against the defendant, and he was fined £2 in each case with regard to selling of rheumatic liniment, essence of linseed, compound of arnica, Dr. Hawker's pills, and £5 in respect of Fellows' mixture—total, £13.—*Western Morning News*.

POISONING CASES AND INQUESTS.

POISONING BY LAUDANUM.

The body of a man, about 22 years of age, was found dead on Sunday, December 23, in the Nightingale Woods, a well-known valley at Portishead. By the side of the deceased was a glass tumbler, and in his pockets were five laudanum bottles, in which had been laudanum, evidently purchased at different shops. It is believed that the deceased poured the contents of all the bottles into the tumbler and drank the whole.—*Standard*.

Obituary.

Notice has been received of the death of the following:—

On October 28, by the wreck of s.s. *Wairarapa* on Great Barrier Island, Charles W. Hill, chemist and druggist, of the firm of Wallace and Co., chemists, Christchurch, New Zealand. Mr. Hill was a native of Leeds, and was for several years engaged in the wholesale department of Messrs. Reynolds and Branson's business. In 1882 he went to New Zealand, and was for a few years in the service of the New Zealand Drug Co., Limited. Mr. and Mrs. Hill had taken a holiday in New South Wales and were returning home by the ill-fated vessel when they both lost their lives. They leave three young children.

On December 19, Crabb Gillett, Chemist and Druggist, Cambridge. (Aged 65.)

On December 21, Charles Love, Chemist and Druggist, Llanconston. (Aged 67.)

On December 22, John Beckett, Chemist and Druggist, York. (Aged 71.)

On December 26, William Cadd, Chemist and Druggist, Bideford. (Aged 82.)

On December 26, George Evanson Morgan, Chemist and Druggist, Market Drayton. (Aged 69.)

Correspondence.

SOME PARTING OPINIONS.

Sir,—There is a slight misconception concerning the age of the Western Chemists' Association. Divisional secretaries were appointed in March, 1889, and at the first meeting, with the President and some members of the Council present, I pointed out the want of unity amongst chemists, and advised my fellow-secretaries to form societies in their divisions, telling them I should, and commended the principle of federation. I will be brief. At page 427, volume xx., series 3, you did me the honour to announce its formation, November, 1889. The great influenza epidemic occurred then, and it was not until March 11, 1890, I was able to hold our first public meeting, reported on page 821. You will also see—volume 21, page 138—the meeting at South Paddington, where there was a desire to form an association, and I was requested to amalgamate with them, and we formed the Western Chemists' Association; and, believing that the stomach is the way to an Englishman's heart, I proposed a dinner to open the session, which took place October 23, 1890 (reported on page 836). After being appointed President, I went as far as Hampstead in the north, Pimlico in the south, London Bridge in the east, Ealing in the west. I had about forty members in the N.K.A. and, altogether, induced over one hundred chemists to join. We had about 145 on the list when I left London, many of whom I did not expect to continue, and their present number is very satisfactory. I am sorry they will not join others in federation.

There are as many subjects as ever before chemists—

1. Company and store chemists.—I have often pointed out that all this could be cut short if chemists were true to themselves and their brethren, by not cutting themselves or giving their services to the enemy; they cannot carry on without qualified assistance. Why are men so short-sighted as to give them the power to do it?

2. The disabilities of Minor associates.—It is a pity, first, that membership should have given qualification. If it had been simply a society among chemists, all would meet on the same platform, Ph.C. members and C. and D. members, but as the Society had existed for twenty-six years before the C. and D. qualifications existed, I think that instead of the title "Associates in Business," they should be admitted as associate members (A.M.P.S.), and this is scarcely doing them justice, as the examination has continually been made more stringent. Oh! for the effect of that opposition which has always existed among chemists!

3. The future of pharmacy.—In the correspondence columns, page 70, of this volume, you published a letter

of mine on apprentices; it would be useless to repeat it. The primary office of the pharmacist is to prepare and supply the medicines of the Pharmacopœia, and to dispense prescriptions, and I think the apprentice's education should be based upon that; but the old style of buying on faith will not do. He must be a good botanist, understanding vegetable physiology, able to recognise true drugs and their qualities and adulterations, conversant with the microscope. In chemistry, to know how to make and ascertain the qualities of chemicals, conversant with their properties and the use of scientific apparatus, the polariscope, spectroscope, able to take specific gravities and use the nitrometer, etc.; up in analyses. I daresay he will soon learn physics, electricity, and photography at school. He should certainly know them, and, if he has a bent, he may take up any science as a "profitable extra"; but I should advocate attention to pharmacy proper as the correct thing. Ignorance is not bliss now, and mediocrity will not give great success, but, as Mr. Jowett says, "there is plenty of room for the best," or, as I once saw it stated, "at the top," while the others are struggling for life at the bottom.

4. Post-graduate lectures, etc.—Why, in London there are, first, the Sciences and Art Classes at South Kensington, secondly, the Birkbeck Institution, a most thorough and excellent college, where there are evening classes on every subject, even the most abstruse, and hundreds of similar institutions! Here we have in Reading a University Extension College, with evening classes on all subjects, and in most towns of any importance full facilities are offered. What more do we want? Time and inclination! What is most wanted is shorter hours for pharmacy. Mr. Sutherland, at Glasgow, November 14, 1894, takes up the cudgels on behalf of assistants, and you, in one of your leaders, support him. Now let me say there are some who are most excellent assistants, and some who are not. "Palmam, etc." I have had a great deal of experience of my own and from others on this point. Under twenty-one they cannot be qualified. How many are there above that age who are not, often for many years after, although all who are at work in pharmacy ought to be? At present there seems to be a lack of qualified men. I have also been behind the scenes of a great many pharmacies where unregistered men are dispensing and taking a leading part, in places where you would least suspect it; and I am sorry to add there are still many who prefer them. I quite agree that a thoroughly qualified man is a great desideratum, and deserves every recognition, and there are plenty of posts open to him; but you often see advertisements in which it is stated there are two or more kept. An assistant generally takes a situation to improve himself, and often learns his business in that way, as well as keeping a receipt book of preparations he has made at his situation. Surely this is part of the equivalent for his services. Then on the question of remuneration. Why, there are many chemists who cannot afford the luxury at all, and are generally the men who work longest. Could we not get joined to the "Additional Curates' Society," and get grants for those poor fellows? On the question of home comforts, there is much to be said on both sides. The custom of "living in" is unpleasant in many cases, as there are very few instances in which a chemist who wants a balance slightly on the right side can afford to keep a hotel, or indulge in high living. Perhaps to some in trying to do so, may be the reason of appeals to the Benevolent Fund. No, sir, it is the condition of the business; and there are many, if they were to pay high salaries and provide luxuries, would hand everything over to their assistants, and have nothing left for themselves or families. There is not only the difficulty of getting good assistants, but they do not stop long enough to be useful. A new assistant is not of much use, frequent changes are hurtful to the business, and it is true that West End houses now make them sign an agreement to stop twelve months. Having given up the public practice of pharmacy, and tried to do my best for it for 45 years, I am about to relinquish my connection with it, and bid you all "Farewell."

Reading.

HENRY LONG.

COMMUNICATIONS received from Messrs. Addison, Clague, Clarke, Cocks, Cracknell, Dott, Guyer, Harries, Haynes, Hill, Ingram and Royle, Jones, Kemp, Laing, Lyne, Ferry, Rudowsky, Wanklyn, Winter, Wright.

AN AUTOMATIC PROCESS FOR AQUA CHLOROFORMI.

BY WILLIAM ELBORNE, B.A.,

Pharmacist at University College Hospital, Demonstrator of Materia Medica at University College.

The B.P. process for preparing aqua chloroformi is to put the chloroform and water into a two-pint stoppered bottle and shake them together until the chloroform is entirely dissolved in the water.

The U.S.P. process is to "add enough chloroform to a convenient quantity of distilled water, contained in a dark amber-coloured bottle, to maintain a slight excess of the former, after the contents have been repeatedly and thoroughly agitated. When chloroform water is required for use, pour off the needed quantity of the solution, refill the bottle with distilled water and saturate it by thorough agitation, taking care that there be always an excess of chloroform present."

Now the B.P. process for aqua camphoræ is one of automatic diffusion of a solid volatile substance into distilled water:—"Enclose the camphor in a muslin bag, and attach this to a piece of glass, by means of which it may be kept at the bottom of the bottle containing the distilled water. Close the mouth of the bottle, macerate for at least two days, and then pour off the solution when it is required." In practice it is customary to keep a large excess of camphor in the bag, pouring off and replenishing with water until the whole of the camphor has disappeared—the operation extending possibly over months; this process, substituting stout parchment paper for the muslin bag, may be regarded as having suggested the following process.

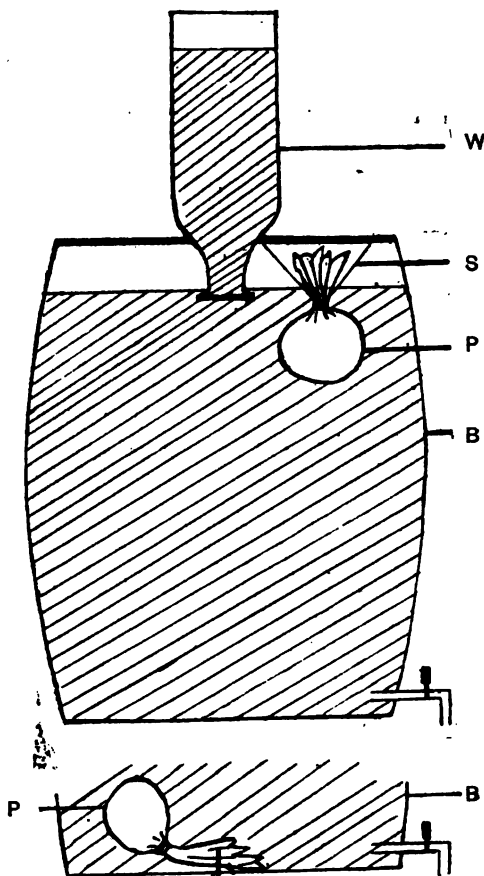
In the sense of filtration, parchment paper is impervious to water, alcohol, chloroform, ether, and essential oils, but if such be enclosed in the parchment paper, and the latter suspended in a vessel of water, the enclosed liquids will, by osmosis, diffuse through the membrane into the water until, in the case of liquids freely miscible with each other, equilibrium within and without the membrane is established, or, if they be only sparingly soluble in water, until the latter becomes saturated: thus, if a fluid drachm of chloroform be enclosed in parchment paper and suspended in 25 ozs. of distilled water, in a closed vessel secluded from light, it is found to have quitted the membrane and saturated the water in eight days, and if a large excess of chloroform be used (say two fluid ounces), retaining the same volume of water, saturation is affected in twenty-four hours.

The process having been in use for some months, has given every satisfaction. In the accompanying diagrammatic representation of the method adopted, B is an earthenware 4-gallon barrel containing distilled water; P, a pint of chloroform tied up in a bag of stout parchment paper; S, the string passing round through the bung and spile-holes and supporting the bag; W, a dark amber-coloured Winchester quart filled with water, inverted and standing in the bung-hole, acting as a replenisher and gauge. The whole being placed in position is allowed to remain intact for seven days, after which period it may be drawn from the tap as required for use. The Winchester, when empty, is to be refilled with distilled water and again placed in position, and the chloroform bag replenished at much longer intervals. A saturated aqueous solution of chloro-

form is stronger than the B.P. aqua chloroformi, three parts of the former being equivalent to four parts of the latter.

For other medicated waters in considerable requisition, such as aq. menth. pip., the process might prove of general application; but where the specific gravity of the essential oil is less than unity it would be requisite to load the flaps of the parchment with spare glass stoppers, in such a manner as to keep the bag at the bottom of the vessel, as represented in the lower part of the diagram.

With oil of peppermint thus arranged, the superincumbent water certainly becomes highly impreg-



nated after a week's immersion, but whether it be preferable to enclose the oil pure and simple, or previously rubbed down with calcium phosphate and water, remains a subject for future enquiry; the automatic replenisher in this instance would probably have to be abandoned on account of a possibly unequal rate of diffusion of the several constituents of the oil.

Substituting 1 lb. of slaked lime for the chloroform, and following the same directions, most satisfactory lime water is obtained—the slaked lime to be previously washed with water, after subsidence the supernatant liquid to be thrown away, and the sediment transferred to the bag.

It may be worthy of notice that, in the absence of distilled water, clear blocks of natural ice yield a product, after melting, filtering, and boiling,

that will stand all the Pharmacopoeia tests for impurity; indeed, water, in the act of freezing, becomes completely separated from everything which is previously held in solution—a familiar physical fact of more than theoretical interest to the pharmacist.

BISMUTH OXYSALICYLATE.

BY D. B. DOTT.

This salt is usually simply described as bismuth salicylate, and there is probably no objection to the practice, as the normal salt (if it exists) is immediately decomposed by water into the basic salt and free acid, so that there is little likelihood of its obtaining a place in medicine. The formula of the basic salt is $\text{BiC}_7\text{H}_5\text{O}_3(\text{OH})_2$, or $\text{BiO} \cdot \text{C}_7\text{H}_5\text{O}_3 \cdot \text{H}_2\text{O}$. This salicylate has within recent years come considerably into demand for the treatment of gastric catarrh and some intestinal disorders. Like most of the basic salts of bismuth, it is not perfectly white, but possesses a perceptibly greyish hue. It should yield mere traces to ether. This is a most important test.

I have examined a sample commended on account of its whiteness, which gave 47.23 per cent. to ether. Such a salt is irritating and objectionable. When dissolved in two or three parts of boiling hydrochloric acid it should yield plenty of crystals on cooling. On complete ignition there should remain 61.31 per cent. of oxide, or very near it. If any of the oxide becomes reduced to metal by the ignition, it must of course be oxidised by nitric acid or otherwise. The salt must be free from chloride and nitrate, which it is very liable to contain when prepared by the method of double decomposition usually recommended. I have tried the most approved processes of this kind, but with quite unsatisfactory results. Addition of glycerin, of sodium chloride, and of ammonium chloride, has been recommended to prevent precipitation of basic salt of the stronger acid. Causse has given* detailed instructions for the preparation of the salicylate, using a large proportion of sodium chloride to prevent formation of oxychloride of bismuth. If the figures as given in the 'Year-Book' are correct, the amount of hydrochloric acid is insufficient to dissolve the oxide (40 C.c. acid to 35 grammes oxide of bismuth). However, I have followed the process exactly, and also tried some obvious modifications of the same, with the result that oxychloride was invariably present in very considerable quantity, salicylate being correspondingly deficient.

In one experiment a large amount of uncombined salicylic acid was found in the product. In the experiment, which was conducted exactly as described in the abstract so far as that could be understood, the resulting compound contained 0.2 per cent. free salicylic acid, and left 94.5 per cent. on ignition, an amount which is far in excess of the proper quantity. These experiments tend to explain the defects of some of the preparations found in the market, and shows the necessity for testing this salt, which will probably take a permanent place in the "materia medica." The tests above described will be found sufficient to practically indicate the purity of the preparation.

* *Comptes rendus*, cxiii., 547. 'Year-Book of Pharmacy,' 1892, p. 29.

PREPARATIONS OF BLOOD-SERUM AS DRESSINGS FOR WOUNDS.

The wonderful progress in surgery which has taken place within the past half-century owes its origin to a better knowledge of the nature of infective processes. It is known that even deep and complicated wounds heal readily if the affected parts can be kept at rest and free from bacteria. The drainage-tube which did such good service in giving an exit to the irritating and poisonous products of bacteria has now been largely discarded in the treatment of clean wounds, and useful industry has produced a wonderful variety of excellent materials for surgical dressings. Where the wound is made by the surgeon the surface of the skin can be cleansed and the instruments sterilised before the incision is made, and dressings of vegetable fibre, rendered sterile by heat, are to a large extent replacing dressings which have been impregnated with sal-ammoniac or other germicides. But, for accidental wounds and septic cavities, antiseptic surgery must ever hold its own, and it is to be hoped that before the rising generation has attained years of responsibility, the disastrous use of the linseed poultice to cuts and other common injuries of the surface will have been relinquished, even by the million, in favour of, say, carbolic acid lotion.

Seeing that the method of the treatment of wounds and sores is of such paramount importance, and that dressings are continually being modified and improved, it behoves pharmacists to follow every new development in surgical therapeutics, in order to know what to keep ready for the use of medical men and for sudden emergency. In the November number of the 'Therapeutische Monatshefte,' Dr. Schleich describes certain dressings for aseptic wounds, and media for the application of drugs to the skin and accessible mucous surfaces. The author reminds us that absolute asepsis is hardly attainable in any wound, and that on the cells of the incised tissue healthy repair ultimately depends. Therefore the surface of the dressing next the wound should not be injurious to the living cells in contact with it. For this purpose Schleich has prepared a powder of dried and sterilised serum of ox-blood. After cleansing the surface of wound, graze, eczematous patch, or clean ulcer, this powder is dusted on, and it dries in the air to a crust. The powder for septic wounds can be obtained mixed with boric acid, iodoform, etc.

It would seem that the medicated powder might be the more useful, for it would be extremely difficult to keep the simple preparation aseptic when once the packet had been opened and dust and damp had obtained access to it. A more extended applicability may perhaps be found for another modification of the serum-powder. This is a paste (Pasta Serosa, Schleich) made with the sterile powder mixed with wax and zinc oxide and freed from water. It is described as having the consistency of honey. It is said to spread readily with a brush over diseased surfaces, where it rapidly sets to an elastic film. The paste can be made the vehicle of drugs, such as ichthyol, chysarobin, resorcin, lysol, etc. The paste is said to mix with mercury in every proportion and also with watery solutions of sal-ammoniac. Thus it appears the preparation may have an extensive usefulness in dermatological practice.

A third preparation is Schleich's Pasta Peptonata. This is made with Adamkiewicz's peptone, added to wax, gum, oxide of zinc, and starch. The author uses this as a means of applying gauze dressings to wounds, etc., of the scalp, neck, buttocks, etc., where bandages do not sit well. A ring of the paste is painted around the wound, and a circle of gauze is cut out and pressed on the wound and the ring of paste. The latter sets firmly in five to ten minutes. To change the dressing, the gauze is cut just inside the ring of adhesive paste, a fresh ring painted over the old one, and a new disc of gauze applied. When the wound has healed the paste can be washed off, as it dissolves readily in water. This paste can be used mixed with iodoform, and the author claims for it an advantage over collodion in that it does not contract and crumple the skin, and that it can be used as an application to moist surfaces. All of Dr. Schleich's preparations can be obtained from Herr Kohlmeier, Bellealliancestr., 12, Berlin, S.W.

THE PASSING OF THE TABLET FAD.

Unquestionably one of the greatest evils from which legitimate pharmacy and medicine suffer is the indiscriminate use of compressed tablets. Beginning, in a small way, they have gradually increased in use until now they threaten to overthrow all other form of preparations. Their convenience, portability, and cheapness are elements that appeal to many, and in the case of inorganic chemicals and well-defined organic compounds, like strychnine, morphine, atropine, etc., they afford, in many cases, a valuable means of drug-administration, but the danger to legitimate pharmacy and medicine lies not in the use of the tablet, but in its abuse; and it is upon this matter that we wish to speak.

In the evolution of drug-administration different forms of preparations have successively arisen. Crude drugs have been followed by infusions, and these by tinctures, extracts, fluid extracts, and active principles. None of these, however, has wholly replaced the others. Each class has shown especial value, and met special indications in disease-treatment. Hence, as a result, medicine has had her implements of treatment largely increased, and pharmacy has broadened in work.

But in the use of tablets a different result is sought. The tablet faddists claim that all medicinal preparations should be given in the form of tablets, and like all extremists they are wrong. After the fad is over, it will be found that tablets afford a valuable means of drug-administration in certain cases, and may be used at times with advantage. That they will permanently replace all the older forms of preparation, we do not believe possible, especially in the case of preparations of drugs of organic origin, for the reason that tablets cannot be made to contain the same proximate principles, in the same soluble form, and in the same proportion, as found in various galenical preparations. Even if it were possible to do this, the tablet does not afford the readiness of assimilation and resulting promptness in action given by other forms of preparations, notably the liquid ones.

Now, when physicians learn that they cannot get

as good therapeutical results with tablets as with other forms of medicaments, they will use tablets for special cases only—after the present fad subsides, for like all other men, including the pharmacist, the modern physician must have his fad.

The abuse of the tablet lies in the endeavour made to have it replace all other forms of drug preparations. Notably is this so in the case of tablets alleged to represent tinctures and fluid extracts. Granting that the liquid preparations be rightly made, we believe that the heat used in concentrating and drying them with the diluent to make the powder for the tablet, must result in an alteration of the proximate principles of the drug, both in proportion and kind.

Heat is a most important factor in altering the character and amount of active principles in a drug preparation. Take, for example, digitalis infusion. M. Roger has shown (*Amer. Journ. Pharm.*, 1889, 174) that the toxicity of digitalis infusion is very notably diminished when the product of maceration is simply concentrated on a water-bath; from 90 to 150 times the amount of the heated product being required to cause death, as compared with the cold water product. What is true of infusion of digitalis when heated, is very probably true of other drug preparations.

How the commercial tablets alleged to represent galenical preparations are made is known only in a general way; each manufacturer following his own working details. We have been informed, however, on good authority, of a practice pursued by one manufacturer in the making of tablets of the so-called narcotic tinctures (i.e., aconite, belladonna, digitalis, etc.), which, if true, is open to the severest censure. This manufacturer, finding that his tablets of these tinctures stuck together on keeping in stock, adopted a new procedure. Instead of making the tablets contain the tincture in minima, as represented, he makes a fluid extract of the drug, evaporates to a thick consistency, washes with petroleum benzin to remove resin, colouring matter and benzin soluble extractive, spreads on plates, dries with heat, and makes up into tablets.

Now, apart from the question as to whether this benzin treatment removes or alters any active principles or not, the fact remains that such tablets are not what they are represented to be. Instead of being made of tinctures, as claimed, they are made of fluid extracts, concentrated by heat, washed with a solvent that removes certain proximate principles, and then heated to eliminate the persistently remaining traces of benzin, which heat probably modifies, if it does not destroy, the remaining proximate constituents. The most enthusiastic tablet faddist can hardly claim that tablets made in this way are fit to replace properly-made tinctures.

Whether this practice is followed by other manufacturers or not we do not know, but we believe that the surest way for physicians to get the best therapeutical results with drugs of organic origin is to use properly-made tinctures and other galenical preparations made by pharmacists. These preparations may vary, somewhat, from natural causes, in their proportion of active principles, but they vary no more than

the varying personalities of sick patients, and as they are usually given until physiological effects are had, the danger in the use of non-standardised preparations of potent drugs is more apparent than real, and has been greatly exaggerated.

We believe that tablets have had their day, or rather have reached their zenith of popularity, and like every form of drug-preparation that has preceded them, will pass away, in part at least, to make room for something else; and when this takes place, physicians will then be found to cry to the newcomer, as they do now with the older galenical preparations and the compressed tablet: "*Le roi est mort. Vive le roi!*" It should be the aim of physicians and pharmacists everywhere, to work together to discourage the abuse of the tablet form of drug-administration.—*Alumni Report.*

READY-MADE THERAPEUTICS.

Some of our readers will, perhaps, recall the heavy villain in the Oriental tale, who used his bed as an instrument of torture. When the victim was short, he was put through a course of elongation, the sinews and muscles being wrung until life was extinct; when too long for the bed, the extremities of the poor wretch were suitably abbreviated.

One of the mischiefs which spring from drug-dispensing by physicians strongly suggests the Arabian story. We refer to the disposition which this practice may engender, to stretch a point in using the medicine at hand when the precise indications of the case cannot be met. Not having what he wants, the dispensing physician is sometimes tempted to use what he has. Thus arises a propensity to make the case fit the remedy, whereas the remedy should fit the case—to forget that medicine was made for man, not man for medicine. Now, if precision in therapeutics is worth anything, it is assuredly fitting to point out the loose, unprofessional habit which may result to the physician from doing his own dispensing.

An evil by far more serious, however, is illustrated by the following incident, related in conversation by the editor of the *Medical Age*. Having occasion to remove from their old resting-place the books and instruments in his father's office, he found a parcel of tablet triturates recently left by the representative of a tablet-manufacturer. A brother practitioner occupied a neighbouring office, and the tablets were handed to him for future use. The gift was vigorously declined: "No, thank you; I don't want them. I don't employ them myself, and I think it's a sin to counsel their use. These tablet triturates are doing serious mischief. Many of our young practitioners, fresh from college, are not strong in their therapeutics. When at a loss for suitable remedies, they look up the price-list of the tablet-maker, ascertain the various remedies employed in the given disease, make their pick, and then dispense. Suppose I have a case of bronchitis. I simply look up bronchitis in the list—I see 'bronchitis tablets'—*Eureka!*"

It is plain that under these circumstances the young physician is not specially impelled to acquire a solid knowledge of therapeutics. Study is hard work, and of most men it is emphatically true that they study

only what they must. The tablet triturate is accordingly an ever present temptation; it demoralises—it causes the physician to look upon his price-list as a compendium of therapeutics, deludes him into the notion that he has found a quick and easy road to the cure of disease, or at the best begets a mechanical, routine habit of prescribing.

No one will venture to compare tablet triturates with the wonderful instruments of precision which have been introduced into modern medicine—the stethoscope, the fever thermometer, the sphygmograph, the pleximeter, etc. And yet we have heard veteran practitioners, who used and valued these auxiliaries at their true worth, deplore the effect which they were plainly exerting on the younger generation of medical men. Too great is the reliance placed on these instruments of precision—too little the pains taken to train the perceptions. Not a few treat the thermometer instead of the fever. Frequently the physician becomes the slave of his implements, and what were intended as his aids prove his undoing by inducing a neglect to cultivate the eye, the ear, the touch.

The truth of our contention is so glaring that it cannot fail to make an impression on the dispensing physician if tactfully, diplomatically presented by the druggist. It surely is no strain on the powers of persuasion to convince the doctor that his wisest course is to treat disease as best he can without regard to his stock of tablet triturates, and that he is the sufferer when he makes his diagnosis with one eye on the contents of his tablet case.—*Bulletin of Pharmacy.*

PHARMACY IN ITALY.

MEDICINE TARIFF.

The prices of medicine allowed by law in Italy are fair, some higher and some lower than those in vogue in England. The following, taken haphazard, will give an idea of the scale:—

	100 Grammes.	10 Grammes.	1 Gramme.
Acetanilide	—	1.50	0.30
Ac. Boric	1.00	0.20	0.05
Ac. Nitr. Dil.	0.40	0.10	—
Ac. Gallic	—	1.00	0.20
Ac. Tannic	—	0.90	0.15
Antipyrine	—	4.80	0.60
Bala. Copaiba	2.50	0.40	0.05
Sodæ. Bicarb.	0.80	0.15	0.05
Pot. Bicarb.	—	0.20	0.05
Caffeine	—	5.00	1.00
Borax	1.00	0.20	0.05
Quinina Sulph.	—	4.00	0.50
„ Mur.	—	7.00	0.80
„ Bichlor.	—	9.00	1.50
„ Bisulph.	—	4.00	0.50
Morph. Mur.	—	—	2.00
Chloroform (by weight)	5.00	1.00	0.20
Codium	—	—	4.00
Collodion	3.00	0.50	0.10
Ether	—	0.60	0.10
Ether Acet.	—	1.00	0.20
Pulv. Gent.	0.80	0.20	0.05
Ol. Camph.	1.00	0.20	—
Ol. Jecor	0.80	0.10	—
Ol. Ricini	1.20	0.20	—
Zinc Ox.	—	0.40	0.10
Pulv. Rhei	—	0.60	0.10
Magnes. Sulph.	0.70	0.10	—

SNAKE POISON.*

BY PROFESSOR W. D. HALLIBURTON, F.R.S.

(Concluded from p. 548.)

The action of the poison may be described under two heads, (1) local and (2) general effects. The most marked of the local effects is cedema; the general symptoms consist of twitching and convulsions in non-lethal doses. A fatal dose kills within a few seconds or minutes. There is also a peculiar effect on the blood.

The conception put forward of the formation of these albumoses is the following:—The cells of the venom-gland by a vital process exercise a hydrating influence on the albumins supplied to them by the blood, the results of which influence are the albumoses found in the venom. The difference between this process and digestion by pepsin or by anthrax bacilli is that the hydration stops short at the albumose stage, and is not continued so as to form peptone or simpler nitrogenous products like leucine, tyrosine, or alkaloids. Gland epithelium is certainly capable of exercising such a hydrating influence; the conversion of glycogen into sugar by the liver cells is one of the best known examples.

The effect of snake venom on the blood opens up other questions. Fontana, more than a hundred years ago, noticed that the blood remained fluid in animals dead of viper bite, and Brainard, writing forty years back, states that when death occurred immediately in animals bitten by rattlesnakes the blood was found at the post-mortem examination to be clotted; but if some time elapsed before the animal succumbed, the blood remained fluid in the vessels. The continued fluidity of the blood has since then been noted by numerous observers in the case of various snakes.

Martin made most of his observations on dogs, but obtained confirmatory results on other animals (cats and rabbits). He found that different doses produced different results. Immediately after the introduction of the venom the coagulability of the blood increases; and this increase in the case of moderate or large doses (more than 0.0001 gramme per kilo. of body weight) culminates in intravascular clotting of greater or less extent. The injection of smaller doses produces a transient phase of increased coagulability, but after two minutes this is succeeded by a "negative phase"; the blood drawn either fails to clot at all, or does so only after the lapse of several hours. The thrombosis occurs more readily in venous than arterial blood, and is frequently confined to the portal area.

These results show a great resemblance between the action of the venom and that of tissue-fibrinogen or nucleo-albumin. The effect of diminished coagulability is not unexpected, seeing that the principal substance in the venom is albumose. But the minuteness of the dose necessary is very striking and distinctive.

The question arises, does the poison contain nucleo-albumin? A nucleo-albumin is a proteid united to a substance rich in phosphorus, called nuclein. It can be detected by the fact that artificial gastric digestion

dissolves the proteid and leaves the nuclein as an insoluble residue. This residue must then be examined for phosphorus. Snake venom contains no nucleo-albumin; and its action not only opens up a novel aspect of the subject of snake poisoning, but also sheds light on the vexed problem of blood coagulation.

The smallness of the dose suggests that the injected material does not contribute itself to fibrin formation. Probably it acts by producing disintegration of the cells in proximity to the blood stream, such as the endothelial cells lining the vascular system. If it thus liberates nucleo-albumin from these the conditions would be practically the same as if this toxic agent were injected from without. The venom is capable of playing havoc with these cells. This was originally shown by Weir Mitchell and Reichert. These authors moistened the mesentery of a cat with a solution of rattlesnake venom, and observed under the microscope the rapid formation of extensive capillary hæmorrhages. Martin repeated these experiments, using black snake venom; and although the action of this poison is less rapid than was the case in Mitchell's experiments, the results were identical.

Whether the venom causes any destruction of the white blood corpuscles is doubtful. These are massed together in such a way that their enumeration becomes a difficult matter. The plasma is stained with hæmoglobin, indicating that a slight solvent action on the red corpuscles has taken place. This, however, is not a distinctive action of snake venom. It is, moreover, well known that substances like distilled water which produce extensive disintegration of blood corpuscles within the blood stream never produce thrombosis; so that, even if the venom produces a disappearance of the leucocytes, that would in itself be insufficient to cause intravascular coagulation.

From this summary of the subject of snake poison one sees how much of interest exists in such researches. They open up fresh questions in wide and important general subjects, two of which, namely, blood coagulation and the poisonous nature of certain proteids, it has been the object of this paper specially to emphasise.

THE ALKALOIDS OF COD LIVER OIL.*

BY J. O. SCHLOTTERBECK, PH.C., B.S.,

Instructor in Pharmacognosy and in Botany, in charge of Materia Medica; University of Michigan School of Pharmacy.

My attention was first directly called to this subject about one year ago, at which time I was requested to make some microscopical drawings of crystals that were said to be alkaloids obtained from cod liver oil. Although I had heard of the discovery by two eminent French chemists of alkaloids in this important medication, I had been rather sceptical of their presence, and, naturally, was tempted to test these crystalline products for alkaloids. They responded in a decided manner to the usual re-agents employed for detecting such compounds. From that time on my interest in cod liver oil continued to increase, and I have decided, if circumstances permit, to make a thorough study of these organic bases.

* Extracted from an article in *Science Progress*.* From *The Pharmaceutical Era*.

A glance through the pharmaceutical, chemical, and medical periodicals for the past forty years or more will satisfy anyone that this drug (if it may be so called) has received due attention from scientific investigators. Many careful analyses of the oil have been made and the results published, only to be largely contradicted by later workers. To be sure, in some particulars the results were fairly concordant; as, for instance, in the case of the glycerides of the fatty acids. Unfortunately, however, this agreement is of no special value, glycerides of the fatty acids being component parts also of the more common fixed oils, which cannot be considered as substitutes for cod liver oil.

A theory long in favour held that the iodine and bromine found in cod liver oil were important, active constituents, but it is a fact that some oils, especially those that are light-coloured, contain none of these elements. At most there is but .000322 per cent. of iodine present, and even if it be in organic combination (a point of which much is made), the quantity is too small to be of practical benefit. The same may be said of bromine.

Then, again, it was advocated that there were biliary principles in the oil which mechanically or otherwise aided in the absorption of fat through the villi of the intestines, but there are many who doubt the presence of these principles, especially in the light oil. According to others, free acids are the cause of the easy emulsification, and, consequently, of the rapid absorption of the oil; yet, if we are to believe that the light oil is superior in therapeutic efficacy to ordinary fixed oils, then it seems that these cannot be important factors, since it is positively stated that only the coloured oils contain appreciable quantities of free acids. Indeed, the statement has been frequently made by clinicians that the light-brown oil is much superior in every particular to the light, and that it is a great mistake to reject the essential constituents for the sake of securing elegant appearance.

It will be seen that there is a great diversity of opinion as to the real active constituents of cod liver oil. We believe some of them to be more or less responsible for the medicinal effects produced, but it would seem, in the light of the above statements, that the administration of light-coloured cod liver oil is rather inconsistent. As yet the chemistry of cod liver oil has not been sufficiently determined to admit of its administration on a rational basis.

The first substantial work upon cod liver oil was done by De Jongh in 1843, but though his analyses show careful and extended manipulations, he did not suspect the presence of alkaloids. In 1887 E. Chazeaud published an exhaustive report of his clinical studies upon morrhual—an extract of light brown cod liver oil claimed by Chapoteau to contain the organic bases. Chazeaud concludes that morrhual—

1. Augments the appetite and regulates the digestive functions.

2. Causes rapid increase in the weight of the body, and consequently improves the general physical condition.

3. Causes increased excretion of urea.

4. Ameliorates and cures cough and all pathological conditions dependent upon general debility.

Virtually the only trustworthy research upon the alkaloids of cod liver oil has been conducted by Gautier and Mourgues, 1888-90. Armand Gautier, by the way, has probably studied leucomaines more thoroughly than any other man, and the reports of his investigations on ptomaines fill many pages in the transactions of the French Academy of Sciences. The presence of alkaloidal bodies in living tissue was known for many years, but it was left for this chemist to study systematically these substances, to which he gave the name leucomaines. Under this title he includes all organic nitrogenous bases found in living tissue as the result of physiological metabolism, in contradistinction to ptomaines, the alkaloidal products formed during putrefaction. Gautier says that the leucomaines are secreted under the influence of the action of muscles, glands, and nerve centres, and must be considered as constant residues of life.

Strecker's discovery of choline in the bile led Gautier and Mourgues to engage in a continued study of cod liver oil, with the hope of finding alkaloids. Their work extended over a period of several years, and the details of their investigations and their conclusions as to the active principles of cod liver oil may be found in their original monograph. Their suspicions as to the existence of these alkaloids were confirmed, and they were able, after repeated operations, to separate completely the following alkaloids:—Butylamine $C_4H_{11}N$, amylamine $C_5H_{13}N$, hexylamine $C_6H_{15}N$, dihydrolutidine $C_6H_{11}N$, aselline $C_{22}H_{33}N$, morrhaine $C_{19}H_{27}N$. They then made a long series of physiological experiments with each one of these principles and concluded that cod liver oil acts mainly by the alkaloids which it contains. It stimulates the nervous system, augments the appetite, accelerates intra-organic oxidation, and increases the secretion of urine and sweat. The observations of De Jongh and of many other celebrated physicians upon the effects produced by light-brown oil are incontestably verified by these experiments, since the alkaloids were obtained from this kind of oil.

In 1892 M. J. Bouillot, by micro-chemical methods, proved the presence of these same alkaloids in the fresh liver of the cod. They are, therefore, leucomaines, and not ptomaines. This same chemist prepared some of the combined alkaloids by the method of Gautier and Mourgues, and carefully conducted a series of physiological experiments on animals and then on man. His results demonstrated these alkaloids to be possessed of marked therapeutic power. They stimulate nutrition and circulation, and act as powerful diuretics. He believes in the practicability of isolating in a mass these alkaloids, and dispensing them in the pharmacies precisely as the alkaloids of plants are now dispensed. It may be said that the individual alkaloids of this mixture are not always the same, and would not always exist in the same proportion. But if these principles are leucomaines, the first objection cannot hold good. Since the name leucomaine implies a constant product of normal

physiological activity in animal tissue, it would be as reasonable to expect to vary in composition as we would expect the concrete juice of the poppy to yield morphine at one time and strychnine or some other alkaloidal body at another. To meet the second objection, that they may not exist in the same proportion, we may cite many parallel cases in plant life. We can find no plant containing two or more alkaloids in which the proportion of these principles is always uniform. As examples, digitalis, aconite, jaborandi, and physostigma may be mentioned.

The distinction between vegetable and animal alkaloids is not very well defined, and, in fact, there seem to be reasons for considering their formation as due to the same causes which bear an intimate relation to the physiology of the cells and tissues of both kingdoms. Thus, vegetable tissues are known to contain not only definite ptomaines, such as choline, but also leucomaines, as hypoxanthine, xanthine, etc. Indeed, in this latter group must be placed, on account of their relation to xanthine, those well-defined alkaloidal bases caffeine and theobromine. Not only are the representatives of these two divisions of basic substances common to both kingdoms, but their parent bodies, lecithin, nuclein, etc., are known to occur in both, thus giving rise to the same bases on decomposition.*

Alkaloids are defined as organic nitrogenous bases developed in plant tissues; in fact, the term alkaloids has heretofore implied a vegetable origin. Leucomaines, as stated above, are similar chemical compounds, produced, however, by animal cells. Ptomaines are formed by micro-organisms, either animal or vegetable. These three divisions of basic substances are all alkaloids, products of cell activity, on the one hand produced by cells united to form tissue, and on the other by isolated unicellular organisms. They act by virtue of their chemical constitution, regardless of their source. Therefore, the three above divisions are purely artificial, made for the sake of convenience. An evidence of the close relationship existing between vegetable and animal alkaloids is the discovery of leucomaines and ptomaines similar in properties to atropine, strychnine, morphine, and colchicine.

As far as we know, the protoplasm of animal and vegetable cells is the same. The above-mentioned products differ then only in the source from which they are obtained, and not in their general chemical constitution. It appears very reasonable, then, that sooner or later these principles will be used as vegetable alkaloids now are.

The terms leucomaines and ptomaines are apparently associated by the masses with something ghostly, death-like, or extremely poisonous. The fact is, the majority of these compounds are harmless, though not inert, and it will be only a question of time when the superstitions regarding this class of substances will be overcome. What objection can there be to using alkaloids possessing valuable therapeutic power, even if they be derived from the animal kingdom? If we can obtain leucomaines or even ptomaines in a high state of purity and possessing the same physiological activities as vegetable alkaloids,

there is no tangible reason why they should not be employed for the same purposes.

* * *

Since no extended investigations have been made to verify the work of Gautier and Mourgues, I have deemed the subject worthy a thorough study, and have accordingly planned the following outline:—

I. To separate the combined alkaloids in as pure a condition as possible and determine their power of forming salts with mineral and organic acids.

II. To establish tests for the identity of the combined alkaloids.

III. To subject these alkaloids to physiological experimentation upon the lower animals.

IV. To attempt the isolation of the individual alkaloids in a pure state, to form crystalline salts with the different acids, to establish identification tests, and to subject them to physiological experimentation.

V. To verify the work of Bouillot upon the existence of alkaloids in the fresh liver of the cod.

Preliminary examination of small quantities of Norway, Newfoundland, and Maine oils showed the presence of alkaloids in varying quantities. One hundred kilos of light brown Norway oil were extracted with some modifications, according to the method of Gautier and Mourgues, and about thirty-five to forty-five grammes of slightly coloured salts of the alkaloid were obtained. They are crystallisable in the form of tartrates, citrates, acetates, oxalates, sulphates, and chlorides.

TEA SEED.

BY DAVID HOOPER, F.C.S.

During the past year several notices have appeared in agricultural papers with reference to the seed of the tea bush and its probable uses in the arts, or for domestic purposes. The price of tea seed some years ago ranged from Rs. 100 to Rs. 200 per maund; now planters would be glad to part with the article for Rs. 40 to Rs. 10 for that quantity, and, indeed, with some it is a waste product without any market value. In Ceylon the planters have for some time been trying to find a use for their surplus seed, but without any apparent success. In Northern India, hundreds of maunds of seed are going to waste on the bushes of abandoned tea estates, and efforts have been made to dispose of the seeds in Calcutta and elsewhere. Although we have not abandoned tea gardens in Southern India at present, the seed is more easily procurable than it was a few years ago, and no doubt it could be supplied in quantity if there were any demand for it. In 1885, some tea seed, under the name of "Tanne," was offered for sale in the London market, and was regarded as a great curiosity, but it met with no purchasers.

The oil from tea seed has been put forward in some places as an article of considerable utility, but some practical experiments in expressing the oil in this country, and the unsatisfactory character of a few authentic samples, have contributed to throw discredit upon such a substance as a source of profitable manufacture. The tea oil which has such a reputation and is so largely used in China, is expressed from the

* 'Ptomaines and Leucomaines.' Vaughan and Novy.

seeds of *Camellia drupifera*, Lour., a different plant to the genuine tea bush. A similar oil is also obtained from the ornamental camellia of our gardens (*C. Japonica*), and the sweet-scented *C. sesanqua*, both natives of China and Japan. The oil from the first of the above-named plants is called "Cha yan," or tea oil, and is largely used for illuminating purposes and for dressing the hair, and sells at a rate which is equivalent to 4d. to 6d. per pound.

Tea oil is obtained from the seeds by cold pressure, then the pulp is steamed and again pressed. The oil is of a light yellow colour and odourless, and leaves an unpleasant after-taste in the mouth if eaten. It remains clear at ordinary temperatures and has been recommended as a good lubricating agent for watch-makers, as it does not dry or clog fine machinery. The peculiar after-taste does not deter the Chinese from using it for culinary purposes, and it is probable that the acrid substance is destroyed by the heat employed in cooking. The oil of *Sesamqua*, an allied plant, is said to have an agreeable odour, and is an article of some importance among the Celestials for dressing the hair. Camellia oil is said to be something like olive oil in not containing much solid fat which would separate out at low temperatures. The seeds are considered poisonous, and the oil was used in olden times by Japanese warriors to grease their swords. These oils are not obtained in sufficient quantity for export, although samples have occasionally been sent to England and the continent for valuation. The oil of the true tea seed (*Camellia theifera*, Griff.), grown in India, seems to be of the same nature as that used in China, as the reports of various experts have proved, but whether any further use can be made of the seeds it will be necessary to know the nature of the other constituents present. It will therefore be desirable to draw attention to what work has already been done by chemists in this direction, and then to sum up their results in the light of a detailed analysis of some waste Indian seed from a local estate.

Mr. Hugh McCullum, Hong Kong, made, in 1884, an examination of some seeds of the Chinese *Camellia drupifera*, and obtained some interesting results. He found the oil in the seed to reach 44 per cent. of the weight, and this oil had the appearance and colour of salad oil, but the taste did not recommend it. The pressed cake contained 10 per cent. of a substance called saponin, which is widely distributed in the vegetable kingdom, and is used for its detergent properties. The soap nut (*Sapindus trifoliatus*) and the soap bean (*Acacia concinna*) of India yield saponin in considerable quantity, and are used largely by the natives for cleansing purposes. In China, the powdered residue of the tea seed is an article of commerce, and under the name of *Cha-tsai-ping* is sold as a rough greyish powder for washing clothes and the hair. This powder, mixed with water, is also used by gardeners for destroying worms and grubs; and made into balls, it is thrown into rivers and tanks to poison fish. Saponin occurs in many other seeds used for fish poisoning, and is always recognised by its sweet taste, which afterwards becomes bitter and acrid and leaves a biting sensation in the throat for some time,

and by forming a lather and froth with water, just like soap. Saponin has very poisonous properties, and is seldom used in medicine.

About twelve years ago tea cultivation was introduced into Brazil, but owing to the Chinese being unable to fulfil their contract, the trees grew up and fruited. Dr. T. Peckolt, of Rio Janeiro, took the opportunity to analyse the seeds and found in them 13 per cent. of starch, 1 per cent. of caffeine, and 7.5 per cent. of fatty oil. The amount of oil here is very low, and the presence of caffeine in the seed is rather remarkable as it has not been confirmed by other investigators.

(To be continued.)

A DRAFT BILL.

INTITULED AN ACT TO AMEND THE WEIGHTS AND MEASURES ACTS OF 1878 AND 1889.

Whereas doubts have arisen as to the legality under the Weights and Measures Acts of 1878 and 1889 of the use by traders of metric weights and measures for the purpose of verifying merchandise intended for export to places outside of the United Kingdom of Great Britain and Ireland, and whereas the Board of Trade now possess standards of metric weights and measures as enumerated in Part II. of the Third Schedule of the Weights and Measures Act 1878, and the Board of Trade is already authorised to verify metric weights and measures intended to be used for the purpose of science and manufacture, and

Whereas it is expedient to remove the doubts which have arisen,

Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons in this present Parliament assembled, and by the authority of the same as follows:—

1. This Act may be cited as the Weights and Measures (Metric Amendment) Act, 1895.
2. That, on and after the passing of this Act, wherever the word "trade" occurs in the Weights and Measures Acts of 1878 and 1889, it shall be so construed as not to prohibit or penalise the use of metric weights and measures, verified by the Board of Trade or local authorities, by export traders.
3. The Board of Trade are empowered to verify all metric weights and measures submitted to them by the metric standards in their possession, and to apply thereto the verification stamp, even when such weights and measures are to be used for export trade purposes and subject to the application of the person or persons desiring verification, being accompanied by a declaration in such terms as may from time to time be considered necessary by the Board of Trade (Standards Department), that it is not intended to use the metric weights and measures so verified for any other purposes than those of export trade.
4. "Export trader," means a person engaged in trade with countries other than those included within the United Kingdom of Great Britain and Ireland. "Export trade" means all business involving the outward shipping of goods conducted between a person in the United Kingdom of Great Britain and Ireland, and any country outside thereof.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JANUARY 12, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, — 17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

AFTER the minutes of the previous meeting had been read and confirmed last Wednesday, the PRESIDENT mentioned that he had received letters from the members of the Boards of Examiners, thanking the Council for their appointment. A letter acknowledging the Council's vote of condolence had been received from the family of the late Mr. HOOPER. Mr. ABRAHAM had also written in acknowledgment of the resolution passed on his retirement from the Council, and Mr. RUTHERFORD HILL had written to thank the Council for increasing his salary as Assistant-Secretary.

On the motion of the Vice-President, seconded by Mr. RYMER YOUNG, and supported by Mr. MARTIN, Mr. WILLIAM WARREN, who succeeded the late Mr. HOOPER in the business carried on by him in Russell Street, Drury Lane, was unanimously elected a member of Council. The necessity for a larger proportion of members resident in London, in order to carry out the work of the Society, was mentioned by Mr. CROSS as one of the reasons for proposing the election of Mr. WARREN, while the evidence he had already given of his fitness for the position was a still further reason. The same views were expressed by Mr. YOUNG and Mr. MARTIN.

In referring to the recent death of Professor FLÜCKIGER, the PRESIDENT spoke of the important work he had done in conjunction with DANIEL HANBURY, and of the great interest he had always taken in the proceedings of the Society, proposing that, on behalf of the members, an expression of condolence should be sent to the family. This was seconded by the Vice-President and carried unanimously.

The additions to the Society comprised sixteen pharmaceutical chemist members, four chemist and

druggist members, sixty-two associates, and ninety-four students.

The report and recommendations of the Finance Committee, which were of the usual routine nature, were adopted without discussion.

On the recommendation of the Benevolent Fund Committee, three grants of fifteen pounds each, one of twelve pounds, and one of ten pounds, were ordered to be paid, the first three being for the candidates unsuccessful at the late election of annuitants.

In reply to a question put by Mr. HILLS, the Vice-President said that although only one case has been dealt with during the past year, and there is no present application for the benefits of the Orphan Fund, he hoped it would not be supposed there is no need of subscriptions to that Fund. He also mentioned the case of MARY M. LEWIS, who was an unsuccessful candidate for admission to the Welsh School, though a large number of votes had been obtained for her, and he hoped she would receive further support next June, as that would be her last chance of election.

In connection with the report of the Library, etc., Committee, the PRESIDENT referred to the Barbados, Pharmacy Act, sent by the authorities of the Colonial Office to the Council for consideration, as being the only matter calling for comment. As illustrating the completeness of this enactment, it was mentioned that it enforced the passing of a preliminary examination before admission as an apprentice, and an intermediate examination before the final qualification at the age of twenty-one. The contrast between those conditions and the inability at home to establish systematic pharmaceutical education in the mildest form, was spoken of as affording ground for regret from every point of view.

An application from the Sheffield Pharmaceutical Society for a grant in aid of the pharmacy school in that city was referred to the Library, etc., Committee for consideration.

The report of the examinations held in Scotland last October showed that on that occasion the passes in the qualifying examination amounted to 46'36 per cent. Only two candidates presented themselves for examination to become pharmaceutical chemists, and only one passed.

On the motion of the PRESIDENT, seconded by Mr. HARRISON, it was resolved that the Law and Parliamentary Committee should be convened at an early date to consider the expediency of applying to Parliament for such further powers as may be deemed desirable. Referring to the Barbados Act mentioned above, the PRESIDENT said that much had yet to be done before the interests of the craft and of the general public are properly provided for, and before those connected with the Society could be placed in an equally favourable position

in relation to each other. Questions relating to poisons, and other questions of no small difficulty relating to limited companies, have to be dealt with, and it was suggested that the present is an appropriate time for considering whether it is expedient to take any steps with that object in the coming session of Parliament, and what form they should take. If a general agreement can be arrived at as to the objects to be aimed at, it will be necessary to be prepared for making an effort either in this session or the next. Mr. HARRISON expressed a similar opinion as to the desirability of being prepared for taking advantage of any opportunity that may arise, and in any case he thought the resolution of the Council would show that it is alive to the exigencies of the time.

The PRESIDENT reported the receipt of a letter from the PRESIDENT of the General Medical Council announcing that it has been decided to issue a new edition of the British Pharmacopoeia, and stating that, among other means to that end, the Council had adopted the recommendation of its Pharmacopoeia Committee, that the Pharmaceutical Society should be invited to assist in the work. In pursuance of the resolution passed to that effect (see page 594), Sir RICHARD QUAIN invited the aid of the Society, and requested that the matter should be brought before the Council.

The nature of the assistance desired is specified in the resolution of the General Medical Council as comprising the obtaining of trustworthy statistics, first as to well-recognised non-official remedies which are in demand, and, secondly, as to those official remedies which appear to have become disused. In addition the Society is invited to nominate pharmacists who would be willing to serve on a Pharmaceutical Pharmacopoeia Committee, under the guidance of the Society's Council, and, with its concurrence, to report to the Medical Council through the Pharmacopoeia Committee of that body.

The PRESIDENT mentioned that he had acknowledged the receipt of this communication, and expressed his conviction that the Council would be glad to assist the General Medical Council in any possible way in the production of the new Pharmacopoeia. At his suggestion, Sir RICHARD QUAIN's letter was referred to the General Purposes Committee for consideration.

A letter received from Mr. UMNEY, as representing a special committee of the London Chamber of Commerce and the Drug Club, was mentioned by the PRESIDENT, as calling attention to the fact that, while it is unlawful to use any metric weights and measures, wholesale druggists receive, from foreign countries where the metric system is in use, orders for goods to be supplied in kilos., etc., and they have been in the habit of supplying goods in that way. Recently the London County Council has given notice that this practice must not be continued, and

an effort is consequently being made to obtain authority in such cases to use weights and measures of the metric system. For that purpose a Bill has been drafted to amend the Weights and Measures Acts of 1878 and 1889 (see page 588) and the assistance of the Pharmaceutical Society was asked in support of the measure. In accordance with a recommendation of the General Purposes Committee, the PRESIDENT moved that the proposed amendment of the law should be supported, and this was unanimously agreed to.

The report of the General Purposes Committee gave particulars of the progress made with cases which have been placed in the solicitors' hands, and the recommendation that proceedings should be taken in several other cases was adopted.

THE LAVOISIER CENTENARY.

THE past year was the centenary of the death of LAVOISIER, the great French chemist, who dealt the final blow to the phlogiston theory and went far towards establishing the science of chemistry upon its present basis. To commemorate the occasion a statue was erected at Bucharest, facing the new Institute of Chemistry near the University, and the Bucharest Society of Physical Sciences has published, in connection with its official organ, the discourse of Dr. ISTRATI, delivered on April 26 (May 8, N.S.), 1894, the actual anniversary of LAVOISIER's execution. This is now produced in a very handsome form, the text being in both Roumanian and French, in parallel columns. The work embodies a full account of LAVOISIER's life and times, and work, whilst numerous engravings embellish it, in addition to a fac-simile of the death warrant signed by BARRETE, and another of LAVOISIER's handwriting. The remainder of the book is occupied by an essay on the past history of science in Roumania, and an account of the proceedings at the banquet held on the occasion of the centenary.

R. H. DAVIES FUND.

At a meeting of the Committee of the above fund, held on the 9th inst. at the house of the Institute of Chemistry, Bloomsbury Square, Dr. W. RUSSELL, F.R.S., in the chair, it was reported that the subscriptions had reached a sum which, after payment of all expenses, left a balance of about £700 for investment. It was resolved to expend this sum in the purchase of an annuity for fourteen years, by which time the two younger sons of Mr. DAVIES will be of age. Mr. BEVAN and Mr. CHATTAWAY were appointed trustees, and the annuity will be administered by them for the maintenance and education of the sons. A statement of account, with the resolutions adopted at the meeting, will be sent to the subscribers as soon as the final arrangements have been completed.

METRIC WEIGHTS AND MEASURES.

In reference to the proposed amendment of the Weights and Measures Acts, mentioned at the Council meeting on Wednesday, we learn that a committee, consisting of Messrs. FRANCIS YATES, J. C. PRESTON, and CHARLES UMNEY, has been appointed by the Drug Club to watch the matter.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, January 9, 1895.

Present—

MR. MICHAEL CARTWRIGHT, PRESIDENT.

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT.

Messrs. Allen, Atkins, Bottle, Gostling, Greenish, Grose, Harrison, Hills, Martin, Martindale, News-holme, Southall, and Young.

The minutes of the previous meeting were read and confirmed.

The PRESIDENT announced that letters had been received from the members of the Boards of Examiners, thanking the Council for their appointments. He had also received a letter from the family of the late Mr. Hooper, thanking the Council for the letter of condolence recently sent, and a letter from Mr. Abraham in acknowledgment of the vote of thanks to him passed on his retirement. The PRESIDENT also read a letter from the Assistant-Secretary in Edinburgh, thanking the Council for the increase in his salary.

ELECTION OF A MEMBER OF COUNCIL.

The VICE-PRESIDENT proposed that Mr. William Warren be elected a member of Council in the place of Mr. A. C. Abraham, resigned. He felt sure that Mr. Warren was a gentleman who would very efficiently perform his duties, but he was mainly induced to propose him because he resided in London. When he looked round the room, and thought of the distance which the gentlemen present—except the London members—had to travel before they could take part in the deliberations, he was strongly impressed with the necessity of having a fair proportion of London members ready to confer with the officials when occasion arose. Mr. Warren, during the short time he was on the Council, gave evidence of his fitness for the position, and he believed that if he had been better known to the members generally the mistake of his rejection at the election would not have been made.

Mr. YOUNG, in seconding the motion, said he had the more pleasure in doing so as he was to some extent, perhaps, the unwitting cause of what had been alluded to as the mistake of Mr. Warren's rejection, at the election. He had not been long upon the Council before he discovered that Mr. Warren was a very much respected and useful man, and that his removal was a distinct loss to the Council. Allusion had been made to the fact that the number of London members on the Council tended to diminish, and if this process were carried much farther it would throw a considerable quantity of additional work on the country members. Many members attended two or three times during the month, and he thought he was expressing the feeling of most of the country members in saying that the majority of them would be unable or unwilling to come more than the usual number of times. He believed this motion would meet with the unanimous approval of the Council.

Mr. MARTIN, as a country member who had a long distance to come, said he knew something of the wear and tear entailed on some of his colleagues in attending meetings. He had had the pleasure of working with Mr. Warren on the Council, and knew something of the good work he was capable of, and he was quite sure the Council would make a wise choice in re-instating him. Since he (Mr. Martin) had been a member of the Library Committee he did not think he

had missed many of the meetings, if any, but it was evident to him that the principal part of the work had to be done by those who lived in or near London.

The PRESIDENT, in putting the motion, reminded the Council that Mr. Warren was the successor of the late Mr. Hooper, at the historic premises in Russell Street, Covent Garden.

The resolution was carried unanimously.

BOARDS OF EXAMINERS.

The PRESIDENT said a letter had been received from the Privy Council, formally approving the appointment of Examiners for the year 1895.

DEATH OF DR. FLÜCKIGER.

The PRESIDENT said it fell to his lot to report the death of another distinguished honorary member of the Society, Dr. Flückiger. He and the late Daniel Hanbury were recognised as the two greatest authorities on materia medica in this country, and perhaps in the world. Their work in that direction, which had been very closely associated with the Society, was of a solid character, and was more interesting by reason of the Society being a voluntary one and not a State-aided institution. He felt sure that all the members, and especially those who felt an interest in science, would join in the expression of condolence he proposed should be sent to the family of their deceased friend.

The VICE-PRESIDENT seconded the proposition, which was carried unanimously.

DIPLOMAS.

The undermentioned, being duly registered as Pharmaceutical Chemists, were granted diplomas stamped with the seal of the Society:—

Alcock, James Elsworth.
Dales, Edward.
Durbin, Henry Eastman.
Hoit, Alfred Henry.
Hope, Richard.
Inglis, Sidney Herbert.
Marsh, Alfred Edward.
Massey, Cecil.
Moffat, Charles Dunnell.
Moorhouse, Joseph Wm.
Peach, Charles Wm.
Pearce, John Hammond.
Perkins, Catherine Susan.
Pickering, Walter.
Potter, Henry Arthur.
Scott, George L.
Taylor, Charles John.

ELECTION OF MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Alcock, James Elsworth Sheffield.
Crouch, William Samuel London.
Dales, Edward Louth.
Davies, John Newcastle Emlyn.
Durbin, Henry Eastman Putney.
Grieve, James London.
Hare, James Archer Hexham.
Hoit, Alfred Henry Southsea.
Hope, Richard Westthoughton.
Humphrey, John Thurlbeck Putney.
Hunt, John Lambert Colwyn Bay.
Marsh, Alfred Edward Luton.
Moffat, Charles Dunwell Stoke Newington.
Stephen, Charles Ventnor.
Taylor, Charles John Folkestone.
Thorpe, Albert Dartford.

Chemists and Druggists.

The following, who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Giles, Theophilus Ridgway Burnley.
 Hughes, Evan Griffiths Manchester.
 Judson, Charles William Ripon.
 Taylor, James Johnson Manchester.

ELECTION OF ASSOCIATES IN BUSINESS.

The following, having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Barker, Arthur Brook Heckmondwike.
 Bately, Stephen Briggs Tottenham.
 Bayley, Cornelius Walsall.
 Bennett, George Bollington.
 Bishop, Edward James Folkestone.
 Blomfield, Francis Henry Erith.
 Cheetham, George Richard Louth.
 Cox, George Frecker Luton.
 Gibson, George Shaw West Hartlepool.
 Gilbert, Joseph Anthony Manchester.
 Grayson, William Henry London.
 Hall, Robert Manchester.
 Middleton, Ambrose Nottingham.
 Moorman, Charles Edgar Shanklin.
 Pater, Joseph Brewster Sheffield.
 Roberts, Arthur Harry Weymouth.
 Roberts, Thomas John Rathin.
 Scroggie, John Henderson Lauder.
 Thorp, Edward Frederick W. Manchester.

Modified.

Holme, Henry Thomas Wallingford.

ELECTION OF ASSOCIATES.

The following, having passed their respective examinations, and tendered, or paid, as Students, their subscriptions for the current year, were elected "Associates" of the Society:—

Minor.

Adamson, William Bo'ness.
 Aitchison, David A. Donald Coventry.
 Allison, John R. Billyard Retford.
 Arrowsmith, G. Micklem London.
 Barritt, Wesley Rotherham.
 Bates, Sydney Lancaster Birmingham.
 Bell, William Edward Bootle.
 Benjamin, Joseph Ystrad Meurig.
 Brooks, Joseph Manchester.
 Browning, Kate Emma Weymouth.
 Burge, William George St. John's Wood.
 Burgess, Frederick William Wigan.
 Chase, Henry John London.
 Copley, William Dawn Long Eaton.
 Dawney, Charles Benjamin Bristol.
 Devereux, Arthur Beaconsfield.
 Duffield, Henry David Colchester.
 Evans, Thomas James Twickenham.
 Gilmour, Andrew Burntisland.
 Hammond, Walter Louth.
 Hay, William Fowlie Aberdeen.
 Haythornthwaite, William Giggleswick.
 Hughes, William Llandysil.
 James, David Griffith London.
 Jennings, Cornelius Birmingham.
 Kingston, Walter Wright Barnsley.
 Kirkpatrick, James Taunton.
 Kitley, Sydney Bath.
 Martlew, Charles Carlisle.
 Miller, Thomas Berwick-on-Tweed.
 Ockwell, Edwin Cirencester.

Palmer, Frank Hermann Hull.
 Paterson, Andrew John Kidd Dundee.
 Rogers, Frank Petworth.
 Russell, John, jun. Broughty Ferry.
 Raxton, James Arbroath.
 Steeds, Frederick George Dorking.
 Tayler, Charles Ludlow Bloxwich.
 Tully, Fred Herman Ashburton.
 Williams, John Corwen.
 Wilson, James Munro Auchmill.

Modified.

Rose, George Rolleston.

ELECTION OF STUDENTS.

The following, having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Annesley, Sara London.
 Bain, Henry Robert Glasgow.
 Battle, John Cyril Marfett London.
 Birnie, Alexander Stephen Aberdeen.
 Bradford, John Finnie Liverpool.
 Buchan, Andrew Edinburgh.
 Castell, Guy John Edward Daventry.
 Chambers, Ernest James Nottingham.
 Cherry, Frederick Bloxham.
 Clark, Alexander Robertson Brighton.
 Collie, Alexander Bellshill.
 Coombe, Frank Ernest Sutton-in-Ashfield.
 Cuff, Sidney New Barnet.
 Davies, John William Llangollen.
 Davis, Oliver Charles Minty Weston-super-Mare.
 Dawson, Henry Gray W. Derby.
 Dawson, Wm. John Reynolds Wimborne.
 Dickenson, Joseph Frederick Hyson Green.
 Durrant, George Stuart London.
 Eades, Joseph Edward Tipton.
 Edwards, William Bridgend.
 Finn, Francis Dudley Dover.
 Fuge, Dingley Palmer London.
 Giles, Frank Folkestone.
 Giles, Lewis John Folkestone.
 Griffiths, Francis Nottingham.
 Griffiths, William Henry Widnes.
 Hallgarth, Harold William Thorne.
 Hampton, William Henry Cheltenham.
 Hankinson, Herbert Stanley Liverpool.
 Hanson, Arthur Bingley.
 Happold, Charles Barrow-in-Furness.
 Harris, William Edward Kingston-on-Thames.
 Hetherington, Vernon Winchester.
 Hickman, Frederick Stanley London.
 Hoare, William Harold Derby.
 Hooper, Richard John Wood Green.
 Huok, Harry Leatherhead.
 Hutton, John Edinburgh.
 James, William Alfred Avebury.
 Jealous, Bernard London.
 Jenner, Thomas William London.
 Jones, George Gilbert Tudor London.
 Kenney, George William Nuneaton.
 Kerby, William Albert Southsea.
 Krause, Harry John Godfred Grimsby.
 Lee, Arthur Torquay.
 Lenton, Walter Henry Thrapstone.
 Lowson, William Driffild.
 Lyle, James Alexander Bradford.
 Martin, Wilfred Romford.
 Mason, Horace Darnscombe Crawley.
 Matthews, Harold Evan Cirencester.
 Maunder, William Henry Teignmouth.
 Merry, Charles Johnstone.
 Moore, Lucy Bramley London.
 Mosley, William Francis Longton.
 Nathan, Hyam Edinburgh.

Neale, Ernest Horace Burton-on-Trent.
 Nicholls, Katie Amelia Hackney.
 Nunn, Ernest Albert Colchester.
 Oliver, Ada Kate.....Plymouth.
 Palfrey, Thomas Alexander ...Alva.
 Palmer, Ernest.....Bath.
 Palmer, William Lynn.
 Parr, Leonard Thomas Wm....Birkenhead.
 Plumstead, Frederic George E....Wymondham.
 Pratt, Dudley Leonard Paddington.
 Pritchard, Richard John.....Brynderwen.
 Read, Robert Thorne.
 Robbins, Robert William Bath.
 Rogers, Ernest.....Wolverhampton.
 Savill, William Arthur Clavering.
 Siviter, William Oscar Bull ...Birmingham.
 Sleep, Alfred Plymouth.
 Smith, William Newcastle-on-Tyne.
 Smith, Wm. Henry Harold Cromer.
 Smorthwaite, Edward Alfred..London.
 Stanley, John Leamington.
 Starkey, Tom London.
 Stephenson, John Gathorne S..Manchester.
 Stoddart, James G. Young ...Edinburgh.
 Thatcher, Benjamin London.
 Thomas, James Douglas Sydenham.
 Turnbull, Charles S. Greenock.
 Waldon, John Bideford.
 Wall, Francis Henry Bridgnorth.
 Watson, John Anderson Dingwall.
 Wheeler, Ernest John Eastbourne.
 Williams, John Foulkes Ystrad.
 Williams, Thomas John.....Treforest.
 Withers, Edgar Walsall.
 Woodruff, Walter Stockport.
 Wooldridge, Thomas Chatham.

RESTORATIONS TO THE REGISTER.

The names of the following persons, who have severally made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

Slater Lupton, 5, Bristol Road, Weston-Super-Mare.
 Edwin Morris, St. Peter's, Kent.
 John Thursby, 2, Victoria Buildings, Sunderland.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

REPORT OF FINANCE COMMITTEE.

This report was of the usual character, recommending sundry accounts for payment.

The PRESIDENT, in proposing its reception and adoption, said it was of an ordinary character, and called for no special remarks. The receipts were of the character usual in December, and the payments were of the kind expected at this time of the year. The Benevolent Fund account, included the usual ground rents, out of which had been paid the interest on the money lent by the Orphan Fund. In the absence of a sufficient sum to invest, or an opportunity of investing it, in ground rents, this was found a convenient way of employing the money in hand on the Orphan Fund account. The receipts included a curious one, viz., 10s. representing the value of the assets belonging to the Hawick Society. After paying the expenses of what he might call its funeral, this 10s. was left, and had been sent for the Benevolent Fund.

The report was adopted.

BENEVOLENT FUND COMMITTEE.

The report of this Committee included recommendations of the following grants:—

£10 to the widow (89) of a registered chemist and

druggist with three children of her own, aged 7, 5, and 2½ years, and three older step-children, dependent or partially dependent. (Edinburgh.)

£12 to the widow (85) of a member and subscriber (1884-1888) who has had four previous grants, amounting to £42. (Doncaster.)

£15 each to the unsuccessful candidates at the election of annuitants in December last.

Four cases were not entertained.

The Committee recommended a verbal alteration in regulation 10 to the effect that candidates' votes for past subscriptions or donations shall be placed to their credit at "each election during his or her candidature," instead of "at the first succeeding election."

The PRESIDENT explained the nature of the proposed alteration in the regulation as being designed to meet what might be a misapprehension. It really only formally directed what now actually transpired in respect to the matter.

The VICE-PRESIDENT then proposed the reception and adoption of the report; and on being put to the meeting it was carried unanimously.

The Orphan Fund.

Mr. HILLS asked had any application been received for the benefit of this Fund during the last twelve months?

The VICE-PRESIDENT said they had only dealt with one case; but he hoped this would not be taken as an indication that they had no real work before them and no need of subscriptions, and even of enlarged subscriptions to the Orphan Fund. These cases frequently came before them, not singly, but two or three together, and they usually required to be promptly dealt with. He trusted, therefore, that the subscriptions would be well maintained, and the Fund kept in an efficient state. In this connection he might mention that he had received a letter from one of their members calling his attention to the case of Mary M. Lewis, whom they supported at the last election to the Welsh school at Ashford. Although she was unsuccessful, she managed to poll 288 votes, but more than that number, he feared, would be required if they were to carry her in at the election next June, which would be her last chance. He had received support from several gentlemen, and should interest himself in the case. He would ask any member acquainted with a governor to be good enough to exert himself to secure his support, the more so as they unanimously agreed on the last occasion the case was before them, that it was in every way one well worthy of their support.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received, including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
November	Day . .	605	32	14	23
	Evening .	186	18	3	8

	Circulation of Books.	Total.	Town.	Country.	Carriage paid.
November . .		253	123	130	£1 13s. 4d.

Donations to the Library had been announced (*Pharm. Journ.*, December 15, p. 506), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

For the Library in London—

Crookes, *Select Methods in Chemical Analysis*, 3rd ed.

Thorpe, *Essays in Historical Chemistry*.

Remington, *Practice of Pharmacy*, 3rd ed.

Planchon and Collin, *Les Drogues Simples d'Origine Végétale*.

Wurtz, *Dictionnaire de Chimie*, deuxième supplément.

Griffith, *Flora of Anglesey and Carnarvonshire*.

Museum.

The Curator's report had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
October . .	Morning	540	35	8	20
	Evening	61	10	1	2

Donations to the Museum had been announced (*Pharm. Journ.*, December 15, p. 506), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

Letters of thanks had been received from the Director of the Science and Art Museum, Dublin; the Professor of *Materia Medica* and Pharmacy at the Royal College of Surgeons, Ireland, for donations of *materia medica* specimens; from Professor Pensig, of the Hanbury Institute, Genoa, and the lecturer on *materia medica* at Oxford, for herbarium specimens; and from the Botanic Gardens of Kew, Edinburgh, and Oxford for specimens of seeds.

The School Staff attended and reported.

The PRESIDENT had reported that he had carefully considered the copy of the Barbados Act, which had been sent by the Marquis of Ripon for the observations of the Council, and it was decided that a suitable letter should be sent to the Colonial Office, expressing approval of the enactment.

Pharmacy Law of Barbados.

The PRESIDENT, in moving the adoption of the report, said the only matter calling for comment was the Barbados Pharmacy Act, which had been referred to the Committee for consideration. He could only say that the Committee was much impressed with the completeness of this enactment. Whilst they at home were in the helpless position of not being able to impose the mildest form of curriculum or pupillage as an introduction to pharmacy, in Barbados the new law enacted that it should be unlawful to take a pharmaceutical pupil until he had passed a preliminary examination. Then he had to pass an intermediate examination before he was twenty-one, and finally, on reaching that age, he had to pass a further examination. Concurrently the privileges conferred on pharmacists were much greater than were enjoyed in the mother country. It was very satisfactory to see such an advance made in one of the dependencies of the Crown. The influence of education and the regard paid by medical men to the importance of having educated chemists and druggists appeared to be so great that they had apparently no difficulty in getting a satisfactory Pharmacy Act, which would not only tend to promote higher education but would confer far greater safety on the public than was the case in this country. He could not help feeling some regret that hitherto all the efforts made in this direction had but prepared the way for their brethren in various parts of the world, no serious endeavour on the part of the great mass of the trade at home having been made to take these matters into their consideration.

Mr. ATKINS remarked that the colonies were free from the monopolies and vested rights which often stood in the way in old countries.

The resolution for the adoption of the report was then agreed to.

SHEFFIELD PHARMACEUTICAL SOCIETY.

The PRESIDENT said a letter had been received from Mr. George Squire, secretary of the above Society, asking for a grant of £50 towards the expenses of the local school of pharmacy, and enclosing a balance sheet. He suggested that the application be referred to the Library, Museum, School, and House Committee.

This was agreed to, and a similar application from Inverness was also dealt with in the same way.

Mr. MARTIN said he presumed the assistance was asked, not to meet current expenses of the school in question, but to provide apparatus, books, or something of a permanent nature.

The PRESIDENT said that was the principle on which the Council had acted hitherto in dealing with such applications.

REVISION OF THE BRITISH PHARMACOPOEIA.

The PRESIDENT reported the receipt of the following letter:—

"General Council of Medical Education and Registration of the United Kingdom.

"299, Oxford Street, London, W.

"December 12, 1894.

"To the President of the Pharmaceutical Society of Great Britain.

"Dear Sir,—The General Medical Council has decided to issue a new edition of the British Pharmacopoeia. Amongst other means to this end, the Council has unanimously adopted the following recommendation of the Pharmacopoeia Committee:—

"The Committee, remembering the valuable assistance given to the Medical Council by the Pharmaceutical Society of Great Britain in the production of the Pharmacopoeia Addendum of 1890, recommends that the invitation to that Society to assist in the compilation of a new edition of the Pharmacopoeia be now forwarded, first as regards the obtaining of trustworthy statistics respecting well-recognised non-official remedies which are in demand, and respecting those official remedies which appear to have become disused, the Society being invited to reply before the end of March, 1895. Further, the Committee recommends that the Council of the Society be invited, as heretofore, to nominate pharmacists who would be willing to serve on a Pharmaceutical Pharmacopoeia Committee under the guidance of the Society's Council, such Committee finally reporting, with the concurrence of the Society's Council, to the Medical Council through the Pharmacopoeia Committee of the Medical Council."

"I have, therefore, the pleasure of inviting the aid of your Society in the directions above indicated, and of asking you to bring the matter before your Council at an early date.

"I am,

"Yours faithfully,

"(Signed) RICHARD QUAIN,

"President of the Medical Council."

He had, of course, acknowledged the receipt of this communication, and felt sure the Council would be glad to assist the General Medical Council in every possible way in the production of their new work. It seemed to him the proper course would be to refer the letter to the General Purposes Committee for consideration and report.

That course was accordingly agreed to.

NEW PUBLICATIONS FOR THE LIBRARY.

The PRESIDENT said a letter had been received from the Under-Secretary of the Department of Mines and Agriculture in New South Wales, saying that on

the suggestion of Mr. Maiden (a corresponding member of the Society), the *Agricultural Gazette* published by the Department would be forwarded regularly to the Pharmaceutical Society as issued.

Mr. MARTIN suggested that the monthly journal of the Imperial Institute, which had just been started, should be obtained for the library.

GENERAL PURPOSES COMMITTEE.

The report of this Committee included the usual letter from the solicitors, stating the progress made with cases placed in their hands. Several defendants had paid penalties and costs without going into court, and a few cases were awaiting trial.

Several cases of infringement of the Pharmacy Acts were reported to the Committee, and proceedings were recommended.

A communication had been received from Mr. Charles Umney, with regard to the use of metric weights and measures, and enclosing a draft bill which had been prepared by a sub-committee of the London Chamber of Commerce. This he hoped would receive the support of the Council. The Committee recommended that the Council take such steps as were practicable, in favour of the Bill.

The Committee recommended that the Law and Parliamentary Committee be convened at an early date to consider the expediency of applying to Parliament for such further powers as might be deemed expedient.

Proposed Amendment of the Pharmacy Acts.

The PRESIDENT said he would propose a resolution "That the Law and Parliamentary Committee be convened at an early date to consider the expediency of applying to Parliament for such further powers as might be deemed desirable." He had just referred to the excellence of an Act passed for Barbados, and he might refer to the fact that there was a good deal yet to be done with regard to education, training, and various other matters, before the members and associates of the Society were placed in an equally favourable position, not only as regarded their relationship to each other, but as to the interests of the craft and the public at large. There were many questions connected with British poison law to consider, and others of no small difficulty connected with company and corporation trading, which came under the notice of the Council from time to time, and it seemed to him that it would be an appropriate time—at the commencement of a new session of Parliament—for the Committee to consider whether it was expedient to take any steps whatever in the coming session, and, if so, to report in the form of a draft Bill what it was considered advisable to go for. He could not say that he was very sanguine as to the possibility of accomplishing anything, but one never knew what might happen. Sometimes, when there was a probability that Parliament might be dissolved at the end of the session, Government business was disposed of pretty promptly, and an interval remained in which some private business might be got through. He was not unconscious of the difficulty of getting any considerable number of members of the House of Commons, in the present somewhat excited condition of affairs, to give their attention to pharmaceutical matters, but he did believe that, if something like a general agreement could be arrived at as to what should be aimed at, it would be desirable either in this session or next to make an effort at legislation. With this view he brought forward the motion, and he hoped that one meeting of the Committee, at any rate, might be held before the next Council meeting.

Mr. HARRISON, in seconding the motion, said he did not propose to occupy time by enlarging upon it, because at this stage it was quite unnecessary. The

terms of the motion implied that they were not pledged to any special Bill, or even to going for a Bill at all, but simply that the Committee should consider whether it was expedient to go to Parliament at all, and, if so, for what. Of course, the Committee, which was large and representative, would consider the various grievances under which the craft was labouring, what remedies might be applied, and whether the time had not come when an attempt should be made to incorporate those remedies in an Act of Parliament. It was impossible to say what could or could not be done in the ensuing session. It might be that there would be a sort of truce in the more active opposition, which had been going on for some time, before an appeal was made to the country, and that during that time some useful and quiet legislation affecting the well-being of the country at large might be got through, or, again, it might not, but at any rate the proposed resolution would show that they were alive to the exigencies of the times, and were prepared to act if circumstances were favourable.

The resolution was carried unanimously.

Metric System of Weights and Measures.

The PRESIDENT then referred to the receipt of the letter from Mr. Umney, who represented a special committee of the London Chamber of Commerce, with regard to drugs, and also the Drug Club, calling attention to the fact that it is unlawful, even for wholesale druggists not less than retailers, to use any metric system of weights and measures. As they knew, from South America and many French-speaking colonies, orders were sent in kilos., and it had been the custom to weigh and dispatch by kilos. in the wholesale drug trade; but a London County Council inspector had recently called on one of the largest wholesale drug houses in the City, and cautioned the firm to continue their use no longer, although he said they might, if they pleased, in the place of the kilo., put on their scales the equivalents in British weights. That could not be easily or satisfactorily done. An effort was accordingly to be made to alter this state of things, and a Bill had been drafted to that end, amending the Weights and Measures Acts of 1878 and 1889. This would be backed by Sir Albert Rolitt, Sir Samuel Montagu, Sir Bernard Samuelson, and Mr. Mundella. It would consist of only three clauses, and its object was to make such an alteration in the law as would allow the export trade to use French weights and measures, of course duly stamped and authenticated. Mr. Umney had asked the Society's support in the matter, and the communication was received in time to bring it before the General Purposes Committee, which yesterday considered the subject, and unanimously decided to recommend the Council to support a resolution in favour of the proposed amendment of the law. He would, therefore, move a resolution to that effect.

The motion was unanimously agreed to.

After dealing with the latter portion of the report of the General Purposes Committee by the specific resolutions recorded above, the Council went into committee as usual to consider the legal portion. On resuming, the report was adopted, and a formal resolution passed authorising proceedings being taken against the persons named therein.

REPORT OF EXAMINATIONS.

January, 1895.

	Candidates.		
	Examined.	Passed.	Failed
Scotland:—			
Major	2	1	1
Minor	110	51	59
Total	—112	—52	—60

EXAMINATIONS IN LONDON.

January, 1895.

(Continued from p. 578.)

MINOR EXAMINATION—PASS LIST.

First portion.

Abraham, E.	Dumper, L.
Adamson, W.	Edgson, H.
Agar, J. P.	Evans, T. J.
Aitchison, D. A. D.	Fairburn, G.
Armitage, T.	Fairlee, A. J.
Arrowsmith, G. M.	Farrow, A. E.
Benington, P.	Frost, W. E.
Biddle, F. H.	Gladstone, A.
Bland, J. W.	Gregory, J. J.
Branch, G. T.	Harries, F. R. N.
Bridgen, J. E.	Hordle, A. G.
Brown, W. J.	Hughes, R. O.
Browning, Kate E.	Jackson, T. B.
Brownlow, R. W.	James, D. E.
Burge, W. G.	James, D. G.
Campkin, B. S.	Johnstone, W. S. L.
Charnock, J. D.	Kirkpatrick, J.
Chase, H. J.	Lacy, A. E.
Cheriton, S. R.	Lawrence, E.
Choat, J. N.	Lewis, D.
Copley, W. D.	McBryde, A. H.
Corfe, J. M.	Marfitt, G. E.
Cox, G. F.	Martlew, C.
Curry, F.	Mason, E. N.
Daroh, E.	Palmer, F. H.
Davereux, A.	Roberts, E. O.
Douglas, H.	Taylor, C. L.
Duffield, H. D.	Williams, F. L.

EXAMINATIONS IN EDINBURGH.

January, 1895.

MAJOR EXAMINATION—PASS LIST.

Two candidates were examined; one passed.

Scott, G. L.

MINOR EXAMINATION—PASS LIST.

Candidates examined	110
„ failed	59
„ passed	51

Allen, G.	Latham, A. W.
Arthur, H. P.	Levie, T. J. P.
Baxter, G.	Logan, J.
Blaylock, R.	Low, A. T.
Bonnar, W.	McIntosh, J.
Braddock, W.	McLean, Moltke.
Bremner, W.	McLeish, Edward.
Butler, A. E.	Marshall, R.
Cowie, P.	Mayor, D. H.
Crombie, J.	Miller, T.
Cruikshank, A.	Postlethwaite, R.
Dobson, J.	Robertson, T. M.
Drabble, F. P.	Ronald, Margaret.
Fell, S.	Salmon, A.
Forrest, T. B.	Sharples, W.
Forster, J. H.	Shepherd, J. H.
Gill, J. A.	Simpson, H.
Hardy, S.	Smart, G.
Heron, J.	Taylor, H.
Horn, J. W.	Thomson, T.
Horsburgh, J. D.	Waters, J. B.
Hubble, W. B.	White, D.
Inglis, W.	White, H.
Kerruish, H.	Wilson, R. W.
Laidlaw, A. G.	Wilson, W. W.

Wyatt, F. L.

FIRST EXAMINATION QUESTIONS.

January 8, 1895.

LATIN.

Time allowed—from 11 a.m. to 12.30 p.m.

I. (For all Candidates.) Translate into Latin:—

1. I have seen the son of the man himself.
2. The sun is greater than the earth, but the moon is smaller.
3. It is true that the slave has been punished by the master.
4. Having taken the camp, they departed.
5. I fear you do not know what you ought to do.

II. Translate into English either A (Caesar) or B (Virgil).

(Candidates must not attempt both authors.)

A. CAESAR.

1. Quum ab his saepius quaseret, neque ullam omnino vocem exprimere posset, idem Divitiacus Aeduis respondit: Hoc esse miseriorem et graviolem fortunam Sequanorum quam reliquorum, quod soli ne in occulto quidem queri neque auxilium implorare audent: absentisque Ariovisti crudelitatem, velut si coram adesset, horrerent; propterea quod reliquis tamen fugae facultas daretur, Sequanis vero, qui intra fines suos Ariovistum receperant, quorum oppida omnia in potestate ejus essent, omnes cruciatus essent preferendi.

2. Qui se ex his minus timidos existimari volebant, non se hostem vereri, sed angustias itineris et magnitudinem silvarum, quae inter eos atque Ariovistum intercederent, aut rem frumentarium, ut satis commode supportari posset, timere dicebant. Nonnulli etiam Caesari renuntiabant, quum castra moveri ac signa ferri jussisset, non fore dicto audientes milites, neque propter timorem signa laturos.

Grammatical Questions.

(For those only who take Caesar.)

1. Decline, in the singular, *meus frater*; and, in the plural, *felix magister*.
2. Write in Latin 17, 96, 19th, twice, three each.
3. Give the principal parts of *regor*, *possum*, *fero*, *fo*, *eo*, *gero*, *jacio*, *sequor*.
4. Give, with the English, six Latin words which have different meanings in singular and plural.

B. VIRGIL.

1. Id metuens, veterisque memor Saturnia belli, Prima quod ad Trojam pro caris gesserat Argis—Necdum etiam causae irarum saevique dolores Exociderant animo. Manet alta mente repostum Judicium Paridis, spretaeque injuria formae, Et genus invisum, et rapti Ganymedis honores.

2. Parte alia fugiens amissis Troilus armis, Infelix puer, atque impar congressus Achilli, Fertur equis, curruque haeret resupinus inani, Lora tenens tamen; huic cervixque comaeque trahuntur

Ver terram, et versa pulvis inscribitur hasta. Interea ad templum non aequae Palladis ibant Crinibus Iliades passis, pepulume ferebant Suppliciter tristes, et tunsae pectora palmis. Diva solo fixos oculos aversa tenebat.

Grammatical Questions.

(For those only who take Virgil.)

1. Decline, in the singular, *meus frater*; and, in the plural, *felix magister*.
2. Write in Latin 17, 96, 19th, twice, three each.
3. Give the principal parts of *regor*, *possum*, *fero*, *fo*, *eo*, *gero*, *jacio*, *sequor*.
4. Give, with the English, six Latin words which have different meanings in singular and plural.

ARITHMETIC.

Time allowed—from 12.30 p.m. to 2 p.m.

[The working of these questions, as well as the answers, must be written out *in full*.]

1. How many more square inches are there in 5 square miles 3 acres 3 yards than there are ounces in 2222 tons? (*Answer in words*.)

2. Divide £1 11s. 6d by $3\frac{1}{4} \times \frac{1}{11}$, and multiply the quotient by $\frac{1}{11}$ of $8\frac{1}{2}$ of $\frac{1}{11}$.

3. Simplify $(1.05 \div 1.05) + (1.25 \div .10625)$.

4. A person after paying 7d. in the £1 for income tax has £349 10s. left. What was his gross income?

5. Write down the English and French measures of Solidity. Give approximately the English equivalents of a mètre, a kilomètre, a kilogramme, a hectare, a litre, a stère.

6. An article which cost 19 guineas per cwt. is retailed at 4s. 6d. per lb., and there is a waste of 5 per cent. What is the gain per cent.?

7. Find the price of $4\frac{1}{2}$ per cent. stock when an investment of £369 5s. produces an income of £42 15s.

ENGLISH.

Time allowed—from 3 p.m. to 4.30 p.m.

1. Analyse:—

"Thrice is he armed that hath his quarrel just;
And he but naked, though locked up in steel,
Whose conscience with injustice is corrupted."

2. Parse fully:—

Thrice, that, but, though, looked. (Question 1.)

3. Correct the following sentences, giving your reasons:—

(i.) My older brother is two inches taller than me.

(ii.) This boys' bottle is fuller than that boys'.

(iii.) He has brought this memoranda, and not before it was wanted, either.

4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—it is said that the night before they were to pass into macedonia brutus was sitting alone in his tent when he saw the figure of a man before him who art thou he asked and the answer was i am thy evil genius brutus i will meet thee again at philippi

*5. Write a short composition on *one* of the following subjects:—

(i.) The good and harm of newspaper reading.

(ii.) The importance of the study of hygiene.

(iii.) A country drive or walk in winter.

(iv.) "Use lessens marvel."

Parliamentary and Law Proceedings.

PROCEEDINGS UNDER THE SALE OF FOOD AND DRUGS ACTS.

THE SALE OF SEIDLITZ POWDERS.

On Saturday, December 29, at the Halifax West Riding Court, Albert Crabtree, manager of the Luddendenfoot Co-operative Society's Stores, was summoned for selling seidlitz powders "not of the nature, substance, and quality demanded." Mr. Han-
kinson, of Wakefield, who prosecuted, called evidence to show that the sample purchased had been certified by the West Riding analyst not to contain the constituent portions of bi-carbonate of sodium and tartaric acid prescribed by the British Pharmacopœia. In defence, it was shown that the powders were purchased from a dealer in Preston, who held a guarantee as to their genuineness. A fine of 20s. and 10s. 6d. costs was imposed.—*Bradford Observer*.

* This must be attempted by every candidate.

POISONING CASES AND INQUESTS.

POISONING BY HYDROCYANIC ACID.

Dr. Charles John Kirwan, a retired army surgeon, aged 65, died on Wednesday, December 19, at Dublin from the effects of hydrocyanic acid. Verdict: "Deceased committed suicide by drinking half an ounce of hydrocyanic acid while temporarily insane."—*Irish Independent*.

POISONING BY CAUSTIC SODA.

Norman Smith Whittaker, aged 21 months son of Mr. John Whittaker, manufacturing chemist 443, Blackburn Road, Accrington, died on Tuesday, December 18, from the effects of drinking a solution of caustic soda, which brought on ulceration of the throat and bowels, and caused inability to take food.—*Accrington Observer*.

POISONING BY MORPHINE.

Frederick Stevens, aged 27, died in the Highgate Infirmary, of the Holborn Union, on Tuesday, December 18, from the effects of morphine, which deceased used to inject into his arms. Verdict: "Death from the effects of morphine poisoning whilst suffering from bronchitis."—*Morning*.

POISONING BY CARBOLIC ACID.

Everest Pallas, a native of Terraezen, Holland, died on board the steamship *Halling*, at the Victoria Wharf, Limehouse, from the effects of carbolic acid, and an inquest was held on Monday, December 24. Verdict: "Suicide whilst temporarily deranged."—*Star*.

POISONING BY MORPHINE HYDROCHLORATE.

John Norman Cawthorne, aged five months, died at Sunderland, on Thursday, December 27, from the effects of morphine hydrochlorate, which was administered in mistake for magnesia by his mother. Verdict: "Accidental poisoning."—*Sunderland Herald*.

POISONING BY HYDROCHLORIC ACID.

Harriet Rothom, aged 36, died at 33, West India Dock Road, E., on Wednesday, December 26, from the effects of hydrochloric acid, self-administered. Verdict: "Suicide whilst of unsound mind."—*Morning Leader*.

POISONING BY LAUDANUM.

Dr. Charles Sibley Hicks, aged 33, died at Eyam on Thursday, December 20, from the effects of laudanum self-administered.—*Nottingham Daily Express*.

POISONING BY OXALIC ACID.

Edward Miles, about 37 years old, died at Exning, on Saturday, December 22, from the effects of oxalic acid, self-administered. Verdict: "Suicide whilst in an unsound state of mind."—*East Anglian Daily Times*.

POISONING BY LAUDANUM.

Francoes Eleanor Ottignon, aged 56, died on Saturday, December 29, at 132, Junction Road, Upper Holloway, from the effects of laudanum, self-administered. Verdict: "Suicide while of unsound mind."—*Daily Chronicle*.

POISONING BY CARBOLIC ACID.

Caroline Rankin, aged 33, died on Monday, Dec. 31, at 27, Hayford Avenue, South Lambeth Road, London, from the effects of carbolic acid, self-administered. Medical evidence was given at the inquest showing that death was due to shock from carbolic acid poison. Verdict: "Suicide whilst of unsound mind."—*Evening News and Post*.

DEATH FROM AN OVERDOSE OF CHLORODYNE.

George James Perrott died at Shildon, on December 30, from the effects of an overdose of chlorodyne, taken as a remedy for insomnia. Verdict: "Death was due to misadventure, by the taking of an overdose of chlorodyne."—*Edinburgh Evening News*.

POISONING BY PRUSSIC ACID.

Charles Whitefield, a surgeon, aged 63, died at 5, Lower Castle Street, Bristol, on Tuesday, January 1, from the effects of prussic acid. Verdict: "Deceased died from the effects of prussic acid, self-administered during a fit of temporary insanity."—*Western Daily Press*.

DEATH FROM AN OVERDOSE OF LAUDANUM.

David Cree, aged 32, died at 38, Gladstone Street, Widnes, on Thursday, January 3, from the effects of an overdose of laudanum. Verdict: "Death from misadventure."—*Liverpool Mercury*.

POISONING BY OXALIC ACID.

Isabella Bone, aged 56, was found lying in a state of unconsciousness on the Albert Embankment, London, and was removed to St. Thomas's Hospital, where she died on Saturday, January 5, from the effects of oxalic acid poisoning. Verdict: "Suicide during temporary insanity."—*People*.

Reviews and Notices of Books.

AN INTRODUCTION TO STRUCTURAL BOTANY. By D. H. SCOTT, M.A., Ph.D. Pp. i-xii., 1 to 288, with 113 figures, 3s. 6d. London: A. and C. Black.

The great development of botanical science in recent years has led to great modification of the views held by the older botanists of the fundamental principles underlying vegetable structure. In consequence of this it has become increasingly difficult for teachers to educate their students in the subject the ordinary elementary text-books containing so much that either needs modification or correction in the light of the new work. The difficulty that besets the ordinary learner is even greater, his text-book and his teacher seeming to be at variance. Nor has the introduction of the type system as presented by the works on elementary biology met the difficulty. In them the student finds presented to him a number of forms with a certain sketchy outline of their respective life histories, but put before him in such a way that he fails to appreciate the connection or relationship between them.

The need for a new kind of elementary text-book of botany has thus become pressing, and the one before us is written with the view of supplying that want. In it Dr. Scott sets out with the idea not of presenting to the student a comprehensive view of the whole subject, but of putting forcibly before him the structure and life work of representatives of the leading classes of the vegetable kingdom. With this view he has elected to work upon the type system, but he has approached it from a different side to the writers of the so-called text-books of biology. At the outset he puts very prominently before the tyro the fact that he is about to study a living being, whose form and structure can best be explained by examining its habits of life. The physiological meaning of the outward form and the internal structure thus serves as the basis of the study. The

advantage of this method of treating the subject is obvious. The student need no longer lose himself in the old dry detail which used to go under the name of botany. The terms used are explained and illustrated as the need for their employment arises.

Dr. Scott begins his introduction to the subject by telling his reader to begin his work by an actual examination of a simple plant, accessible to everyone—the common wallflower—and he makes the study essentially a practical one, the plant and the text-book being used together. The student is first led over the external features and then taken to the more difficult details of the internal structure. In this way the vegetative and reproductive characters are successively examined and the life history is illustrated. This having been mastered, the next section of the work describes simply and lucidly the processes of development by which the structures are produced.

Two other types are dealt with in the volume, the lily and the spruce fir. Each is examined with sufficient minuteness, and then careful comparisons of the three types are made. A further section deals in more detail with the physiological processes which all alike carry out. The author must be heartily congratulated on the new departure he has made in the direction of botanical teaching. He intimates that the present volume is likely to be followed by another, treating in a similar way with the lower forms. This new volume will be eagerly looked for by the students who work intelligently through the present one.

PHARMACOPŒIA OF THE HOSPITAL FOR DISEASES OF THE THROAT. Edited by F. G. HARVEY, F.R.C.S., Edin. Fifth Edition. Pp. 112. Price 2s. 6d. London: J. & A. Churchill.

The fifth edition of this book contains chiefly formulæ for special preparations used in the treatment of throat diseases. The pharmacy of the book is well done, and shows evidence of practical and careful supervision except that in a few cases names of preparations contained in the British Pharmacopœia have been appropriated for preparations of different composition, e.g., *mistura cretæ*, *unguentum potassii iodidi*, and *vapor chlori*. The introduction of a number of "nos-trum preparations," of which "fumus himrod" and "collunarium hazelin" are examples, is also an unsatisfactory feature from a pharmaceutical point of view, and has been often enough condemned by medical authorities.

An introductory paragraph is given at the beginning of each set of special formulæ, describing their uses and modes of application. Nasal bougies and douches, gargles, medicated cotton wools, ear-drops, insufflations, pastils, and spray, fuming, hot, cold, and dry inhalations, are the chief classes of preparations so treated. The pastils are practically lozenges, of the kind known popularly as jujubes, made with a basis of glyco-gelatin coloured with carmine, and are specially useful in inflamed conditions of the mouth and throat when the medicinal agent is not incompatible with gelatin. Working formulæ are also given for the well-known T.H. lozenges made with a basis of fruit paste

instead of sugar. The book will no doubt serve as a reliable and useful guide to the medical practitioner, in suggesting the best means of applying remedies for treatment of diseases of the throat and neighbouring organs.

FORMULAIRE DES MÉDICAMENTS NOUVEAUX ET DES MÉDICATIONS NOUVELLES POUR 1894. Pp. 316. Price 3 francs. Paris: J. B. Baillière et fils.

This useful little work has now reached its fifth edition, and, as usual, gives full information in a concise form respecting all the newer aids to therapeutics. Amongst the more recent additions are articles on alangin, alpol, antipyrin, bromethylformin, cathartinic acid, chloralose, crystalline, diaphthol, diiodoform, ferratin, guaiacol-iodoform, gallate of mercury, glycerophosphates, glycozone, iodoformine, iodide of rubidium, lung extract, medicated milks, loretin, lycetol, manacin, naphthol diiodide, paraform, resol, salacetol, salumin, serotherapy, sodium chlorate and sulphocateate, tannal, thermodin, thioform, vasogen, etc. A large number of plants recently introduced into medical practice, and not as yet described in any formulary, are also dealt with. The book will prove invaluable to every up-to-date pharmacist who is acquainted with the French language.

Books, etc., received.

ÉPURATION, FILTRATION, ET STÉRILISATION DES EAUX POTABLES. By D. EDM. GUINCHET. Pp. 369, with 52 illustrations. Price 5 francs. Paris: J. B. Baillière et Fils. From the Publishers.

KERNER and OLIVER'S "Natural History of Plants." Part 9. Price 2s. 6d. nett. London: Blackie and Son, Limited. From the Publishers.

ORGANIC CHEMISTRY. By W. H. PERKIN, jun., Ph.D., F.R.S., and F. STANLEY KIPPING, Ph.D., D.Sc. (Lond.) Pp. 560. Price 6s. 6d. London and Edinburgh: W. and R. Chambers, Ltd. From the Publishers.

HANDBOOK OF PHARMACY. By VIRGIL COBLENTZ, Ph.G., A.M., Phil. D. Pp. 480, with 395 illustrations. Price \$4.00. Philadelphia: P. Blakiston, Son, and Co. From Haynes and Co.

CENTENARUL LUI LAVOISIER, 1794-1894. Buletinul Societatii de Stiinta Fizice. Pp. 184. Illustrated. Bucuresci: Lito-Tipografia Carol Gsbl. From the Society.

CATALOGUE OF NEW AND SECOND-HAND BOOKS (English and Foreign) on Chemistry. No. 61. William F. Clay, 18, Teviot Place, Edinburgh. From the Publisher.

UBER ANHALONIUM LEWINII UND ANDERE CACTEEN. By L. LEWIN. Reprinted from the 'Archiv für experimentelle Pathologie und Pharmakologie.' Leipzig: J. B. Hirschfeld. From the Author.

STUDIEN ÜBER AKRITISCHE CRYPTOGRAMEN. I. By G. LAGERHEIM. Reprinted from the 'Tromsø Museums Aarshefter.' From the Author.

LABORATORY EXERCISES IN BOTANY. By EEDSON S. BASTIN, A.M. Pp. 540. Illustrated. Price \$2.50. Philadelphia, U.S.A.: W. B. Saunders. From the Publishers.

Notes and Queries.

HABENDA RATIO VALETUDINIS.

[789.] "Will you kindly let me know the literal and free translations of the motto *Habenda ratio valetudinis*?—"STUDENT."

The literal meaning of *ratio* is the art or mode of thinking; *habenda* is the gerundive of *habeo*, the literal meaning of which is "ought to be had." *Ratio* depends entirely on the context for its signification—without reference to context no opinion as to its true translation is of any value. When in combination with *habere* or *ducere*, it means to have a care for, or a regard, or consideration for—[a noun in the genitive case]. *Habenda ratio valetudinis* means literally "a care of health ought to be had," and in good English, "It is our duty to care for health."

PHENYLHYDRAZINE TEST FOR GLUCOSE.

[790.] "I find some difficulty in the use of this test, which has been spoken of very highly by Sir G. Johnson.—G. PONTHEU."

This test depends upon the formation of phenylglucosazone ($C_{18}H_{21}N_3O_4$). When an aqueous solution of phenylhydrazine hydrochloride and sodium acetate is added to a strong solution of dextrose, and the mixture is heated on a water-bath, a yellow precipitate of needles, singly or in bundles, of phenylglucosazone begins to form in a few minutes. In dilute solutions the crystals form more slowly. After an hour and a half the precipitate is said to amount to 85-90 p.c. of the weight of dextrose present. The crystals are purified by recrystallisation from alcohol, and should have a melting point of 204°-205°. Since decomposition commences at this temperature, the determination should be made quickly.

INK FOR WRITING ON GLASS.

[791.] The following formula is said to yield a satisfactory ink for writing on glass, which is not affected by water:—White lac, 10 parts; Venice turpentine, 5 parts; oil of turpentine, 15 parts; indigo in powder, 5 parts. The first three ingredients are melted together on a water-bath, and the indigo is then added (*Neueste Erfindungen und Bull. de pharm. de Bordeaux*).

BORO-SALICYLIC GLYCEROLE.

[792.] The formula for this preparation (see *ante*, p. 434), as employed by M. Jaudon, is as follows:—Mix boric and salicylic acids, each 10 Gm.; distilled water, 10 Gm.; glycerin, 40 Gm. The mixture is then heated to ebullition, after which calcined magnesias, 1 Gm., is added, and the whole of the water evaporated at a gentle heat. The glycerin used should be of such strength that, on cooling, the glycerole should measure 50 C.c., and each 5 C.c. will then contain boric acid, 1 Gm., and salicylic acid, 1 Gm. (*Répertoire*).

PIPERAZINE.

[793.] "I shall be glad if anyone can inform me of a better way of providing for the deliquescent character of piperazine ordered in five-grain packets than by dispensing it in 1-drachm bottles?—W. N. G. L."

Correspondence.

THE REMUNERATION OF THE PHARMACIST.

Sir,—It has frequently been a topic of considerable interest and discussion among chemists as to how to meet the changed condition of their surroundings, when they are introduced into a neighbourhood heretofore free from such competition, by some of the now far too numerous drug stores locating themselves, and proceeding to announce with the most unblushing effrontery that they are prepared to dispense medicines, etc., at about one half the usual charges. Such establishments usually commence with a great distribution of handbills and price lists, scattered without stint throughout a large area. They also make the most reckless statements concerning themselves and their older-established neighbours, and without doubt a great deal of anxiety has often been occasioned to those who felt they might be seriously affected and prejudiced by such highly improper and unprofessional conduct. Various remedies have been recommended and tried in different localities; in some cases prices have been reduced by all the neighbouring pharmacists, in others by a few only, though in many, probably the large majority, the old-established chemist of repute, and with a personal connection to sustain him, has not been driven to alter the honourable and well-tried mode of conducting his business.

As to the best way of meeting the difficulty, it is obvious that no one mode of procedure can be advanced as being suitable for all cases. Each one must, of necessity, be considered and treated in the light of the special circumstances surrounding it, but I am strongly of opinion it is not desirable, as a rule, for the pharmacist to attempt to follow his "cutting" neighbour, and I am fortified in this opinion by the experience gained from a considerable and extensive point of view. Numerous cases are on record where the attempt to reduce prices all round in the very limited business of a chemist has entirely and ignominiously failed, and the bankruptcy court has sometimes been the last resort of the ill-advised and unfortunate individual who commenced it. But it does not follow therefore that it is not desirable, in some cases, to meet the wishes of patients and customers who desire by ready-money payments to obtain the advantage of a reduced charge or a discount. Indeed, there is abundant evidence that many families do not wish to change their chemist, and are content and satisfied if he will make some advance on the lines indicated towards meeting their wishes. A great many of the public do know and recognise that it is far more important to have a reliable and honourable man to prepare their medicines at a fair and not exorbitant charge, than, for the sake of a few pence, to run the risk of getting something inferior or less carefully prepared; and when the facilities which the pharmacist usually gives for obtaining medicines at any time are further borne in mind, it should be conceded that he deserves more than a mere trade remuneration.

But further experience now shows that while at first, for a longer or shorter period, the new man who introduces "cutting" prices apparently succeeds in doing a considerable business, yet he is far more liable to see that business vanish than the man who, slowly but surely, has built up a more solid connection. It is not too much to say that in more than one prominent example a business started and conducted on the "flaming" principle, while injuring the adjacent pharmacists, has done no real

or permanent good to its owner, who therefore has the double mortification of having injured his neighbour and done no good to himself. One does not envy such person the remorse any honourable man must feel under such circumstances. On the whole, therefore, I believe the best way of acting is to make some concession to those who desire it, on the lines previously referred to, and, in addition, for the pharmacist to make his own preparations and guarantee their purity and efficacy. If he at the same time is quick to recognise that the public likes to try new inventions, and if he does not rely too much on old-fashioned and out-of-date preparations, there is no reason why a very considerable business cannot be done in the most legitimate manner. This plan has the immense advantage of securing to himself the sale of the articles he prepares, and, of course, the prevention of anyone undercutting the same. The last point is that, if the young gentlemen who are the assistants of to-day would carefully consider that by giving their services to stores, they are making it far more difficult, and often impossible, for them to be able to commence business for themselves when the time comes, surely it should influence them to resolve not to help in any way towards such a result, not even if for a time they are offered somewhat seductive advantages.

RIATRO.

PHENOL.

Sir,—In Mr. Coull's interesting paper on "Carbolic Acid," the remarks on the method which should be adopted in determining the boiling-point of a liquid seem open to some criticism. The temperature at which a liquid boils may be modified by the nature of the vessel, by substances held in solution, and in the case of a mixture of liquids the temperature may be far above that of the vapour which is distilling. The theoretical boiling-point is the lowest temperature at which the substance exists in the state of vapour under a certain pressure. Hence the thermometer ought not to be placed in the boiling liquid, but in the vapour. The practical difficulty is to ensure that the vapour is not over-heated, and even with such appliances as Le Bel-Henninger tubes it may well be doubted whether the difficulty is always overcome. One thing is certain, that the actual determination of the exact boiling-point is a much more difficult business than the text-books suggest. This is manifest from the fact that there are very few compounds as to the b.p. of which different observers are agreed to within half a degree. For phenol, authorities vary from 180° to 182°. This variation is doubtless sometimes due to faulty methods of observation, more often to the extreme difficulty in obtaining any material of perfect purity; but just possibly there is some unknown quantity, like the unsuspected constituent of the air, which comes in to vitiate results.

Edinburgh.

D. B. Dorr.

Answers to Correspondents.

"Sunbeam."—In the Journal for November 18, 1893.

A. H. Parker.—Thanks, but already received.

"Bacteria."—Griffin & Sons, Garrick Street, Covent Garden, W.C.; Becker & Co., Hatton Wall, Hatton Garden, E.C.; Baird & Tatlock, Cross Street, Hatton Garden, E.C.

COMMUNICATIONS received from Messrs. Ainsworthy, Allgood, Baxter, Bray, Buck, Butcher, Callia, Clarke, Collett, Evans, Hill, Howe, Ince, Kemp, Line, Mabon, MacBain, Mumbray, Parker, Phillips, Pollard, Prosser, Reeve, Robinson, Tyler, Umney, Ward.

THE CONDITION OF PHARMACY IN AMERICA.

BY GEORGE M. BERINGER, A.M., PH.G.

If the question were propounded to the educated pharmacists of the United States, "Is your condition socially, professionally, and financially satisfactory?" but comparatively few could answer in the affirmative either phase of the interrogation. The examination of current American pharmaceutical literature would likewise present a negative answer. That this dissatisfaction with the present condition of pharmacy is likewise spreading on the opposite side of the Atlantic appears evident from the tone of recent pharmaceutical writings. Many are wasting time and space of the journals in deploring the changes in pharmacy, for which, perhaps, they are blamable, without presenting a single item of scientific or educational value that would tend to elevate the pharmacist from his present state. We have every evidence that the educated pharmacists of the United States are not satisfied with their present position in society, but are preparing to seek that recognition and professional standing to which, by education and training, they should be entitled.

The writer frankly admits that the thought, "Not what I am but what I hoped to be comforts me" expresses his own condition and, he believes, that of a majority of the intelligent pharmacists of America. According to public opinion, the pharmacist is not, as a rule, looked upon as possessing any peculiar education or standing that would warrant him to assume a position higher in the social scale than that of his neighbours who are confectioners or grocers. The American public has been educated to classify as professional, the minister, the lawyer, the doctor, and the politician, and the methods of the latter are very apt to be copied in matters not political. Although the studies of the pharmacist may have been as extensive, and the time still spent in his study, if he be conscientious in the discharge of his duty, may be equal to that of either the lawyer or the physician, he is exceptionally indeed recognised as their equal. Particularly objectionable is the air of superiority assumed by the average young man who has been but recently inflated with the degree of M.D. Alas, this is too frequently admitted by the pharmacist. The writer recalls a recent experience with such a medical light who questioned the purity of a specimen of oil of gaultheria, because, "It was not as it ought to be, distilled from the roots of the shrub."

At the present time, our professors in the various colleges of pharmacy are alone accorded a standing as professional pharmacists. They are, as a rule, learned specialists, whose ability in their special departments is beyond question, but generally, not now, if ever, actively engaged in the drug business. And here, again, one has but to examine the list of teachers to discover with what reverence the degree M.D. is considered a requisite for a teacher of pharmacists.

That pharmacy in America has reached a critical period in its history is acknowledged. Various are the reasons assigned for its unsatisfactory financial and professional condition. Foremost is the "bargain-hunting" tendency of the public. While professing to be in love with the principle

of protection, the American people practise daily, each in their own sphere, to the heart's desire of the most pronounced free-trader, the right of buying in the cheapest market. The pharmacist suffers from this no more nor no less than other tradesmen.

PROBLEMS AFFECTING PHARMACY.

The pharmacist of to-day finds himself confronted with a number of problems in his business which were not presented to his predecessors. His business is now necessarily of a two-fold character. While part of his labour and duties to society require a training of a scientific character, the majority of his transactions are purely commercial. Commodities, such as hair-brushes, toilet powders, perfumery, and "patent medicines" require no special skill or education to sell, and the American pharmacist is here brought in direct competition with the "patent-medicine" cutter, the grocer, the dealer in dry goods, and that modern renovation of the general store of last century, the large department store. If he wishes to retain his patronage he is compelled to prove himself as shrewd a merchant as these new competitors. Cutting in the price of such commodities is but the natural result of that sharp competition that at present marks all commercial enterprise. The public cares nought for the professional standing of two salesmen of such commodities, and will patronise the one who sells the cheaper. The druggist cannot expect his business to be an exception to general laws, and must learn to adopt himself to those changes which are continually occurring in commercial occupations.

Someone says "That the selling of such materials is foreign to the occupation of the pharmacist." Perhaps so, and I trust that in the future this ideal of pure pharmacy may be realised. But, at the present time, what community would support druggists who took such a radical stand, and kept only medicines in the strictest sense? Here and there we do find a store in which this has been attempted to a moderate degree, but in the majority of cases such stores are peculiarly situated, or the property of physicians whose practice sustains them.

The pharmacist engages in business from the same selfish motive, that of profit, as actuates the baker or the banker, and as a business man he must supply the legitimate wants of his patrons. A lecture to the customer on what he should purchase is sure to divert his trade to the more shrewd, even if less conscientious competitor. At present, comparatively few pharmacists would exist without such accessory business. In a recent issue of one of our pharmaceutical journals, the editor advises as a needed reform "That pharmacists cut out of their stock all proprietary medicines the composition of which is unknown." An examination of the advertising pages of the same journal showed them filled with advertisements of nostrums. Would it not be advisable for the editorial and the business managers of that journal to get in harmony and consistently commence this "cutting out" business at home? It is noticeable that the writers of such refrains are generally editors or physicians, and not those who actually have to deal with the problem.

It must be admitted that the present condition of pharmacy in America is largely due to the class

of men who have overcrowded its ranks. Many are illiterate and engaged in a calling for which they have neither fitness nor innate love. It is a fact, that a large percentage of the druggists still lack a scientific education fitting them for their duties. Yet, strangely, while the leaders of pharmacy are acquainted with the shortcomings of the American pharmacist, and heartily desire his elevation, their national pride is such that they deprecate any criticism either at home or abroad. Would it not be far more honest to frankly admit that educated pharmacists are in the soda water, cigar, "patent medicine" business, etc., not from any personal desire, but because under the present condition of our society it becomes necessary for a successful business career.

MEDICAL MEN AND PHARMACY.

In his legitimate sphere—dispensing—the pharmacist finds himself encroached upon by the physician who, not content with his fee for prescribing, would deprive the pharmacist of his meagre earnings from compounding. The physicians of the United States are being encouraged in dispensing by some of the manufacturing pharmacists. With characteristic effrontery, they send one salesman to the druggist, professing to protect his interest by not selling to physicians, and another salesman directly to the doctor, dilating on the advantages of dispensing their tablet triturates, etc. With consummate hypocrisy the same enterprising manufacturers influence medicine and pharmacy through the journals which they either own absolutely or control through advertising contracts.

The city of Camden, N.J., on the opposite side of the Delaware from Philadelphia, and almost under the shadow of the medical and pharmaceutical colleges of the latter city, illustrates forcibly to what extent this custom is growing. With fifty drug stores; of that number physicians own twenty-seven. Out of ninety regular physicians, fifty-five are interested in supplying their patients with medicines, either as proprietors of stores or directly from their offices. This same condition exists in many localities even in the larger cities. To such an extent has this increased in New Jersey that one of the State Board of Medical Examiners recently expressed his opinion to the writer, "That within another decade there would be no druggists, as every physician would dispense his own medicines." I beg leave to dissent from this view, as the awakening to a higher education of both the medical and the pharmaceutical student will lead to specialisation and the divergence of the two professions whose lines appear to have been converging.

It is apparent that one of the evils resulting from incompetent pharmacists is the selection of improper apprentices, and thus the preceptor may stamp his unfitness upon several generations. The schools of pharmacy have been peculiarly remiss in deciding the qualifications of students admitted to instruction. In many there is a lack of any regulations requiring the student to possess even a common school education. It has been thought advisable to leave the determination of the fitness of the applicant for "drug honours" entirely to the proprietor, but it will be necessary for several generations of proprietors to pass away before we can notice much improvement. The necessity for selecting better material for our future druggist is

essential before we can expect any decided advance of the profession of pharmacy.

LACK OF SCHOLASTIC TRAINING.

Our colleges of pharmacy are awakening to the necessity for more thorough tuition, and are improving and extending their instructions. But it certainly is impossible to impart a scientific, professional education to those who lack as a foundation even a common school training. The fear of losing a few students is the strongest argument that can be advanced against the adoption of preliminary examinations by the colleges. Such arguments should be beneath the dignity of a school for professional instruction. While it is necessary for the pharmacist to manage his store for the purpose of money-making, this should not be the object of the colleges. The teaching of pharmacy, at least, should be kept above the level of a money-making enterprise.

But very few of the young men now entering pharmacy have been favoured with a preparatory collegiate education, and it becomes somewhat of a problem whether, under the present position of pharmacy, and the public opinion of the same, men of education can be induced to enter its ranks.

SUGGESTED REMEDIES.

The evils leading to the present condition of pharmacy have been recognised, and the remedies suggested have been legislation and combination. The pharmacy laws of the various States are not uniform in their requirements, and the certificates of registration are not now, as a rule, recognised outside of the State issuing them. In Pennsylvania no diploma is accepted as proof of the qualification of the applicant for registration, who is compelled to pass an examination. In New Jersey the Board of Pharmacy accepts as sufficient the diploma of any reputable American college, provided the college has required of the graduate at least four years' practical experience in the store. Many of the laws drafted as pharmacy laws have been so amended in the halls of legislation as to exempt from their provisions the doctors of medicine, or even to extend to them privileges not granted the educated pharmacist.

Various plans of combination have been suggested to prevent cutting, but all such have sooner or later failed.

Whatever the improvement or the reforms that may be accomplished they will not be the result of either legislation or combination, but must emanate from pharmacy itself. We must have better material to commence with; young men whose idea of pharmaceutical education is something more than just sufficient to obtain a degree. We must have all our pharmaceutical colleges aiming to impart the most thorough education, to graduate the most perfect students. Their aim must be higher education, not larger classes, and their diplomas must be conferred only on those possessing a knowledge and skill befitting a professional standing. We must have pharmaceutical journals that sustain and advance the scientific and professional side of pharmacy, and are unwilling to sell their honour and influence for advertising patronage. Above all, the public must be educated to appreciate competent, thoroughly educated pharmacists. The present condition must be the foundation for future advance in American pharmacy.

THE ABSENCE OF SUGAR FROM NORMAL URINE PROVED BY A NEW AND SIMPLE METHOD.*

BY SIR GEORGE JOHNSON, M.D., F.R.S.

Emeritus Professor of Clinical Medicine and Consulting Physician to King's College Hospital; Physician Extraordinary to Her Majesty the Queen.

The author adduces additional and, as he believes, conclusive, evidence of the absence of sugar from normal urine, while pointing out that whether a trace of sugar does exist in normal urine or not is a question of interest to chemists and physiologists, but one of no practical importance. For the clinical observer the presence or absence of glycosuria may be decided in about two minutes by the following simple test. A drachm of urine—or, what is nearly the same amount, 4 C.c.—is placed in a test-tube about half an inch in diameter, and to this is added an equal volume of a saturated aqueous solution of picric acid, and half the volume—that is, half a drachm, or 2 C.c.—of liq. potassæ (P.B.).† An orange-red colour instantly appears as a result of the incipient reducing action of kreatinin upon picric acid at the ordinary temperature. The colour is deepened by boiling, and if, after the liquid has been kept at the boiling point for about a minute, a bright red colour appears through the test-tube when held up to the light, the urine, for clinical purposes, may be confidently pronounced free from sugar. If an aqueous solution of glucose, in the proportion of not more than two grains to the ounce, be tested in the manner described, the liquid will be rendered so dark that no light is visible through the full diameter of the tube. For clinical and life assurance purposes, no other method of testing for glycosuria equals this for the ease and rapidity with which it may be conducted, and for the absolute trustworthiness of the result. The presence of sugar having been thus ascertained, the quantitative determination may be speedily and accurately effected by means of the picro-saccharometer. The method of using the saccharometer is described in an appendix to this communication.

The author, since the publication of his paper 'On some Common Sources of Error in Testing for Sugar in the Urine,'‡ has obtained additional, and he believes conclusive, evidence that no trace of sugar is to be found in normal urine.

In that paper he referred to the work of his son, Mr. George Stillingfleet Johnson, who discovered that, by the action of mercuric chloride, kreatinin, which is a constant constituent of the urine, is precipitated in combination with mercury as a definite chemical compound, from which the kreatinin, having been separated in a crystalline form, its ultimate composition and its reducing action upon cupric oxide and picric acid were accurately determined §

The kreatinin having thus been separated from the urine, it is found that the filtrate exerts no reducing action upon either the copper or the picric acid test; and that any sugar which might be present is not removed by the mercuric chloride process, is proved by the fact that when a known weight of glucose has been added to the urine, it is found undiminished after the separation of the kreatinin.

That by avoiding the application of heat, and the use of destructive chemical agents, the natural kreatinin of the urine has been separated unchanged, and that this is the sole agent in normal urine which exerts a reducing action upon picric acid,* is proved by the fact that when the amount of picric acid reduction by the urine has been accurately determined, the indicated amount of Stillingfleet Johnson's kreatinin in aqueous solution is found to give precisely the same degree of picric acid reduction colour as the urine when the liquids are undiluted and in different stages of dilution, until the amount of kreatinin is no more than one grain by weight in 200,000 minims of liquid.

To obtain the complete reduction of picric acid by an aqueous solution of uncombined kreatinin containing 1 grain to the fl. oz., more potash is required than in testing normal urine.

The amount of liq. potassæ (P.B.) must be 1½ drachm instead of ½ drachm, and the liquid should be boiled for 90 seconds instead of 60. The kreatinin of the urine appears to be associated with some substance which enables it to exert its full reducing action in presence of a smaller amount of potash than is necessary when uncombined kreatinin is dissolved in water.

For comparing the colours resulting from testing diluted urine, and an equally diluted solution of kreatinin, the simplest plan is to place a drachm of each liquid in two test-tubes of equal diameter, to add to each 1 drachm of picric acid solution, and ½ drachm of liq. potassæ, then to boil for a minute, after which, the two tubes being placed side by side, the difference or the equality of colour can be observed. If, as has been asserted, glucose were present in normal urine in the proportion of not less than 0.05 per cent., about one-third of the reducing action of picric acid would be caused by glucose, the remaining two-thirds by kreatinin.

The extreme delicacy of the picric acid reaction of kreatinin in largely diluted solutions affords a simple and accurate means of detecting a mixture of a small quantity of glucose with kreatinin, whether in the urine or in an aqueous solution.

The author has ascertained that a watery solution of glucose ceases to give any coloration with picric acid and potash when the dilution is carried beyond 1 part in 10,000 of liquid.

If, therefore, the reduction-colour in normal urine were in part due to the presence of a small proportion of glucose, the colour resulting from an analysis of the urine and of an aqueous solution of kreatinin of the same reducing power, which is equal when the

* Abstract of a paper in the *Lancet*, Jan. 12, 1895.

† See a letter by the writer on the Value of 'Picric Acid as a Test,' in the *Lancet* of Jan. 23, 1894.

‡ *Lancet*, July 7, 1894. Reprinted in *Pharmaceutical Journal*, July 14, 1894.

§ The details of this investigation are published in the 48rd vol. of the *Proc. Roy. Soc.*, and more briefly in the 68rd vol. of *Proc. Roy. Med. Chir. Soc.*

* Uric acid reduces cupric oxide, but not picric acid.

two liquids are undiluted, would be unequal when the dilution is carried beyond the point, *i.e.*, 1 grain in 10,000 minims of liquid, at which glucose ceases to exert any reducing action upon picric acid.

The urine would be paler than the equally diluted solution of kreatinin in proportion to the amount of sugar therein contained.

It should be borne in mind that the reducing action of kreatinin upon picric acid and potash is less than that of glucose, in the proportion of 10 to 12.

When the reduction of a normal urine is 0.8, calculated as glucose, the amount of kreatinin to give the same reduction colour would be 0.96.

It must also be remembered that, while the reducing action of glucose upon picric acid and potash ceases when the dilution is carried beyond 1 in 10,000, that of kreatinin continues until the dilution reaches 1 part in 200,000.

It has invariably been found that by comparing the colour resulting from the picric acid test applied to normal urine with a solution of kreatinin of equal reducing power, when the colours in the undiluted specimens have been equal, they have remained equal after the two liquids have been diluted beyond the point at which the action of glucose must have been eliminated, had any glucose been present. Amongst other experiments the following is described. A sample of urine gave with picric acid a depth of colour indicating 0.6 gr. per fl. oz., calculated as glucose. To 1 fl. oz. was added 0.3 gr. of glucose. By this addition the amount of reduction was raised to 0.9 gr. per fl. oz., two-thirds being due to kreatinin, one-third to the added glucose.

The reducing power of kreatinin being less than that of glucose in the proportion of 10-12, the amount of kreatinin required to give the same colour as the saccharine urine was 1.08 grain in 1 fl. oz. of water. The testing of the undiluted urine and of the kreatinin solution respectively, gave a red coloration of exactly the same tint.

When the two liquids were tested after they had been diluted, so that the proportion of solid to liquid was 1 in 14,000, the action of the glucose having been eliminated, the urine was considerably paler than the kreatinin solution. If it had not been known that one-third of the reducing action of the undiluted urine was caused by the added glucose, the fact might have been ascertained by observing that in order to equalise the colour of the two liquids, when tested after dilution had been carried beyond the point at which glucose ceased to exert its reducing influence, one-third of its volume of water had to be added to the kreatinin solution.

Here, then, we have a simple method by which not only the absence of sugar from normal urine may be ascertained, but the exceptional presence of a small amount may be quantitatively determined. Such exceptional presence being, it is believed, abnormal and extremely rare.

The author states that, for experimental purposes, the pure urinary kreatinin may be obtained at Apothecaries' Hall.

APPENDIX.

*Directions for the Quantitative Determination of Sugar in Urine by Sir George Johnson's Picro-Saccharometer.**

The following solutions are required:—

1. Standard solution of ferric acetate, equal in tint to that yielded by a solution of glucose containing 1 grain per fl. oz. This standard solution is prepared as follows:—

R. Liquor ferri perchloridi fortior (P.B., sp. gr. 1.42) 3j.
Acidi aceticæ glacialis (P.B., sp. gr. 1.058) 3iv.
Liquor ammoniæ (P.B., sp. gr. 0.959) 3ij.
Aquam destillatam ad 3iv.

Mix first the iron and the acid; then add the ammonia, and water up to 4 fl. oz.†

2. Saturated solution of picric acid, prepared by boiling the crystals with distilled water in the proportion of 6 grains to 1 fl. oz., and allowing the excess to crystallise out on cooling.

3. Liquor potassæ (P.B., sp. gr. 1.058).

Apparatus Required.

1. A tube about 12 inches in length, graduated into 100 cubic centimetres, with longer divisions at each 10 cubic centimetres, accurately stoppered and lipped.

2. A tube, half the above length and of equal diameter, accurately stoppered to hold the standard solution.

3. A boiling tube, 10 inches long, $\frac{3}{4}$ inch in diameter (internal), lipped, and graduated up to 4 fl. drachms.

4. A one drachm measure.

Method of performing the Analysis.

Measure 1 fl. drachm of urine into the boiling tube. Add 1 fl. drachm of the saturated picric acid solution, and $\frac{1}{2}$ fl. drachm of liquor potassæ. Make up to the 4 drachm mark on the tube with distilled or rain water. Heat over a spirit or gas lamp, and keep the liquid boiling for about a minute. Cool by dipping the tube after a minute in cold water, and ascertain that the cold liquid measures exactly 4 fl. drachms. If less, make up to the 4 drachm mark with distilled water; if more, evaporate down to the 4 drachm mark. If the colour of the boiled liquid is the same as that of the ferric acetate standard or paler, the urine is either free from sugar or contains less than 1 grain per fl. oz. If the colour is paler than the standard, boil with 2 drachms of urine instead of 1, then divide the indicated reduction by 2. In analysing an undiluted urine the phosphates precipitated by the potash often cause turbidity, which must be removed by filtration before the colour can be accurately estimated. It should be borne in mind that all normal urines reduce picric acid to an extent equivalent to from $\frac{1}{2}$ grain to 1.2 grain of glucose per fl. oz. This reduction is due to kreatinin. This should be allowed for when the quantity of glucose present is very small. If the colour of the boiled liquid is darker than the standard,

* Made by Messrs. C. F. Müller & Co., 148, High Holborn, W.C.

† The standard ferric acetate solution may be obtained from any pharmaceutical chemist.

introduce it into the graduated tube until it stands at 10 divisions, whilst the stoppered tube at the side is filled with the ferric acetate standard. Now dilute the dark red liquid in the graduated tube with distilled or rain water till the colour is the same as that of the standard. Each division above 10=0.1 grain per fl. oz. Thus, 13 div.=1.3 grain, 30 div.=3 grains per fl. oz., etc. If more than 6 grains per fl. oz. are indicated,* dilute the urine 10 times by pouring urine up to 10 divisions on the graduated tube, and distilled or rain water up to 100. Then analyse the diluted liquid as before. In this case each division on the saccharometer indicates 1 grain of sugar per fl. oz. Thus, diluting from 10 up to 48 divisions shows that the urine contains 48 grains of sugar per fl. oz. If the urine, when 10 times diluted, gives a colour paler than the standard, it contains less than 10 grains of sugar per fl. oz. Another portion should then be diluted 5 times by filling the graduated tube up to 10 divisions with urine, then up to 50 divisions with distilled or rain water.† The analysis is performed as before. The value of the divisions now will be half that with a 10 times diluted sample. Thus, 18 divisions would indicate 9 grains per fl. oz. If the urine has a specific gravity of 1035 or more it should be at once diluted 5 or 10 times before commencing an analysis.

The percentage weight of sugar to the volume of urine may be ascertained by dividing the number of grains per fl. oz. by 4.8.

TEA SEED.

BY DAVID HOOPER, F.C.S.

(Concluded from page 588.)

The oils of tea seeds have been submitted to very critical examination by chemists, and favourable reports have been passed upon them. Mr. R. H. Davies, of the Apothecaries' Hall, London, analysed in 1885 some oil from China. He stated that the specific gravity was .917, and it began to congeal at -13°C . It yielded 93.94 per cent. of fatty acids containing 83.15 per cent. of oleic acid. Saponification equivalent 195.5. The bitterness of the oil was marked, but it was not found to have any drying property.

Mr. L. van Itallie, of Rotterdam, arrived at almost the same conclusions from his examination of a sample of oil drawn and refined from Assam tea seed. He found the oil to have a specific gravity of .920, and a congealing point of -12°C . It yielded 91.5 per cent. of fatty acids containing 72 per cent. of oleic acid. Saponification equivalent 194. The oil had an acrid taste, but, in this case, it was observed to have somewhat of the properties of linseed oil. These two analyses show that tea oil consists largely of olein, and resembles the well-known fixed oils of olive, almond and sesame, but the presence of an acrid substance militates against its use in European cooking, in place

of salad oil. Katsumajima, a Japanese scientist, made an investigation in 1879 of the acrid principle of camellia seed, and found it to be as poisonous as foxglove. This statement has lately received confirmation in the fact that one of the active principles of foxglove belongs to the class of saponins, and has a similar action upon the heart.

A small bag of tea seeds was placed at my disposal by a friend on the Nilgiris, and I am glad to be able to give a complete analysis of them. The seeds were $\frac{3}{4}$ to $\frac{5}{8}$ of an inch in diameter, rounded or hemispherical, of a chocolate brown colour. A thin, brittle integument enclosed the whitish oily kernel. The brown husks were removed, and the kernels dried in a water oven, which resulted in the loss of one-third of their weight of water. The dried kernels were reduced to fine powder, and, upon analysis, were found to contain the following constituents:—

Fixed Oil	22.9
Albuminoids.....	8.5
Saponin.....	9.1
Carbohydrates.....	19.9
Starch	32.5
Fibre	3.8
Mineral matter (ash)	3.3

100.0

The fixed oil is much less in quantity than is found in the Chinese seeds, and is about the same as that yielded by Assam tea seed, viz., 20 per cent. The oil was bitter and acrid, but did not deposit or thicken after being kept in an exposed situation for one week.

The albuminoids, calculated from the nitrogen, are disappointingly low. Oil-seed cake, or "poonac" from other sources yields as much as 20, 30, or even 40 per cent. of nitrogenous matter. If the oil were pressed out, the cake would still be comparatively poor in this ingredient, which is so useful in all substances employed for manurial purposes.

The saponin is the poisonous glucoside already alluded to. With such a large proportion of noxious material, it would be impossible to recommend the seed cake for feeding stock.

The carbohydrates consist of sugar and mucilage which are present in all seeds. No alkaloid, such as caffeine, was detected in any of these extracts.

The mineral matter is very low, and would be of little value for the sake of any phosphoric acid and potash it contains.

In conclusion, I would recommend that—

1. *Tea seed is not suitable for manufacturing a fixed oil.* The proportion of oil in the seed is much smaller than that found in well-known oil-bearers, as sesame, coco-nut, and castor. The oil is difficult to express on account of the emulsifying property of the saponin. The saponin is poisonous, and appears to dissolve to some extent on every occasion in the oil, which is a damaging feature, and care should be taken to obtain edible materials from wholesome sources.

2. *Tea seed should be used as a manure.* The amount of nitrogen is not so high as in many poonacs, but it is higher than the amount contained in farm-yard manure, and its application would be beneficial to the

* The reason for this is that 1 fluid drachm of picric acid solution is sufficient for the decomposition of not more than that proportion of sugar.

† The dilution of the urine may be more conveniently made by pouring 5 or 10 C.c. into a 50 C.c. flask, and adding water up to the 50 C.c. mark.

tea if beaten into a powder and placed in the ground near the roots of the tea bushes.

3. *Tea seed should be tried as an insecticide.* Insects are known not to attack the seed-cakes of the "bassia" and "neem" or "margosa," because of the acrid principles contained in them. For the same reason they would keep away from substances containing the poisonous saponin, and would be killed with a strong infusion of the seeds. The seed could be used in two ways, either as a decoction or as a dusting powder. In the first case, the bruised seed should be allowed to stand in boiling water, and then filtered from the fibrous material. The clear liquor may then be applied to the plants infested with the pest. Or the seeds may be reduced to fine powder and sprinkled over the plant or near the ground where the insect or blight abounds.

I have made some experiments in using tea seed cakes as a fuel in the same way as "goba" is used in the North of India, but the large quantity of carbohydrates soluble in water prevents rapid and complete ignition of the dried cake, and smouldering for the same reason cannot take place.—*South of India Observer Press.*

THE RELATION BETWEEN CHEMICAL CONSTITUTION AND PHYSIOLOGICAL ACTION.*

By T. RHYMER MARSHALL, D.Sc. EDIN.,

Professor of Chemistry, St. Mungo's College, Glasgow.

There is now no doubt, from recent researches, that a close relationship exists between the constitution of a chemical substance and its physiological action. This connection was observed by Bunsen in 1843, even when a knowledge of the constitution, especially in regard to saturation, was practically unknown. Bunsen found that cacodylic acid ($\text{CH}_3\text{AsO}_2\text{OH}$), which contains about 54 per cent. of arsenic, is inert, although absorbed into the system, and he thus clearly saw that the composition alone of a substance was insufficient to explain physiological action, but that constitution—that is, the structure of the molecule—must also be considered.

One of the first and most important steps to a knowledge of this relationship was made by Professors Crum-Brown and Fraser, who showed that the introduction of methyl into the molecule of strychnine or thebaine changed the tetanising action of those poisons on the spinal cord into a paralysing one on the ends of the motor nerves. This conclusion has lately been found to be incorrect, as the tetanic action is not altered by the saturation of the compound by methyl iodide, but simply masked by the motor nerves being paralysed.

In this paper I shall confine myself to the consideration of the physiological action of carbon monoxide, carbon dioxide, methane, and ammonia, and a few of the derivatives of marsh gas and ammonia, both for the sake of simplicity and for the purpose of showing that the physiological action of a substance of known constitution may even now, in some cases, be predicted with certainty.

SATURATION.

The pharmacological activity of a substance depends largely on the degree of saturation, and the study of

the compounds of carbon and oxygen bears this out in a marked degree. The atom of carbon has four separate points of attraction for other substances for which it has an affinity when brought under the necessary conditions. If excess of carbon be heated with oxygen only two of these affinities will be satisfied, and the active substance carbon monoxide is produced, and as it still contains two free affinities, the compound is termed unsaturated. The physiological activity of carbon monoxide is due to this state of unsaturation, and is thus capable of combining with the hæmoglobin of the blood, thereby impairing its function as an oxygen carrier. If we burn carbon monoxide, then the higher oxidation product, carbon dioxide, is formed, and now the substance is saturated—that is, the carbon no longer possesses free affinities. It is thus easy to understand, from the consideration of the degree of saturation, that carbon dioxide cannot be an active poison like carbon monoxide, as it is no longer capable of forming firm compounds with active organic substances.

However, it cannot be considered altogether inactive because, in the presence of water, it forms carbonic acid, $\text{CO}(\text{OH})_2$, a weak member of a class of bodies possessing a distinct action on living protoplasm.

MARSH GAS AND MARSH GAS SERIES OF HYDROCARBONS.

Marsh gas, CH_4 , which is a compound where all the free affinities of carbon have been satisfied by hydrogen, is a perfect example of an inert saturated compound in the physiological sense. When inhaled, largely diluted with air, it causes no disturbance in the animal system, but produces an anæsthetic action when breathed in quantity, not because it acts directly on living tissue, but for the reason that it prevents oxidation by exclusion of oxygen.

Marsh gas is the first of the series of very stable hydrocarbons known as paraffins, which may all be derived from marsh gas by continuously replacing a hydrogen atom by the methyl radical CH_3 . The volatile members of this group act as anæsthetics by a process of suffocation, and the higher members are quite inactive, not possessing any recognisable physiological action.

UNSATURATED HYDROCARBONS.

If, however, hydrogen be removed from the paraffins, their active unsaturated compounds are formed. Ethylene, C_2H_4 , the first member of the olefine series of hydrocarbons, like marsh gas, acts as an anæsthetic, but owing to the free affinities is much more dangerous to life by acting similarly to carbon monoxide. Acetylene, C_2H_2 , a still more unsaturated substance, is more poisonous than ethylene.

THE HALOGEN DERIVATIVES OF THE PARAFFINS.

The paraffins, although inert saturated compounds, may be rendered very active by directly substituting hydrogen atoms by halogen atoms. In all these derivatives the halogens are more firmly bound than in their salts, but, notwithstanding, the halogens still exert a distinct general physiological action of their own, so that in a compound like chloroform, CHCl_3 (which is marsh gas with 3 hydrogen atoms replaced by chlorine atoms), not only must we consider the

* From the *Glasgow Medical Journal* for January.

effect of a saturated hydrocarbon, but also the action of the chlorine present.

Chloroform, therefore, acts as an anæsthetic (1) by a process of suffocation; (2) by causing, in virtue of the chlorine present, semi-coagulation of the protoplasm in the nerve cells.

It has been found by experiment that the pure halogens cause anæsthesia by producing partial coagulation in the nerve cells, and they also act still more strongly on muscular fibre. This action on protoplasm is also produced in a modified degree by the halogen derivatives of the paraffins, and in considering the choice of an anæsthetic, it is important to remember the physiological action of the halogens. Although chloroform is one of the most convenient anæsthetics, still, owing to the presence of so large a percentage of chlorine, the tendency to paralyse muscular tissue is great. There is little doubt that a safer compound could be selected, having all the convenient properties of chloroform, by choosing one of the chlorinated higher paraffins. Great care must be exercised that these halogen derivatives be used pure, as very frequently grave disturbances and even fatal results have been produced by impurities.

The bromine and iodine derivatives exert a more powerful influence than the chlorine compounds, but they are partially decomposed in the presence of light, hydriodic and hydrobromic acids being split off.

THE OXYGEN DERIVATIVES OF THE PARAFFINS.

The paraffins are capable of being oxidised indistinctly into three totally distinct classes of bodies, each having a special general physiological action of its own. If we successively introduce into methane or ethane three oxygen atoms, we obtain types of these classes—



These substances may be considered as hydrocarbons where hydrogen atoms have been replaced by the residue, hydroxyl. This residue is one of the most important in chemistry, and its presence in organic substances influences the physiological action to an enormous extent.

ALCOHOLS.

The class of bodies where only one hydroxyl group is attached to a carbon atom is known as the alcohols. We shall now only consider the case of the simple alcohols of which methyl alcohol is the type, and where only one hydrogen in the paraffin is replaced by hydroxyl.

The activity of the alcohols is due to the hydroxyl residue, which probably produces physiological effects by entering into loose combination with nervous tissue, thus interfering with the processes of oxidation and reduction, on which its activity depends. Alcohols, by abolishing to a greater or less extent the excitability of all the nerve centres, acts as hypnotics and anæsthetics. The higher alcohols produce prolonged sopor, owing to the greater density and the influence of the larger number of carbon atoms on the hydroxyl residue.

(To be continued.)

NOTES ON RECENT SCIENTIFIC INVESTIGATION.

DISPLACEMENT OF CARBON IN MOLTEN CAST IRON BY BORON AND SILICON.—The study of the solubility of carbon in different metals, or in the same metal at varying high temperatures, has led H. Moissan to investigate the action of boron and silicon upon a definite carbide of iron maintained in the liquid state. The metal experimented upon contained 3.18 p.c. of total carbon and 0.5 p.c. of slag. Ten grammes of this and 2.5 Gm. of boron were placed in a boat, which was enclosed in a tube filled with dry hydrogen, and heated in a reverberatory furnace. After the experiment the metal was yellowish in colour, with some long prismatic crystals on the surface, and, on analysis, was found to contain 8 to 10 p.c. of boron, but only 0.27 p.c. of carbon, whilst the matters constituting the slag had been entirely eliminated. The button was covered with a black felt-like layer of graphite. A further sample of metal containing 3.24 p.c. of carbon, and 0.418 p.c. of slag was experimented with under similar conditions four times, and the percentages of each left after the action of the boron were as follows:—

	1	2	3	4
Carbon	0.36	0.28	0.17	0.14
Slag.....	0.02	0.00	0.03	0.01

In another specimen of iron the percentages of carbon and slag were reduced from 3.35 and 0.36 respectively, to 0.24 and 0.06. On adding to molten carburised iron 10 p.c. of iron containing 10 p.c. of boron, the percentage of carbon present was reduced from 3.75 to 2.83, and a very hard white button resulted which was not affected by a graver. In the case of silicon the results were similar, and the two elements—boron and silicon—thus appear to act by precipitating the carbon from its solution in the molten metal, just as certain compounds precipitate others from their aqueous solutions (*Comp. rend.*, cxix, 1172).

IRON CHROMATES.—Thirteen iron chromates have been prepared by C. Lepierre, of which two only were already known. They are all coloured double salts, and are generally hydrated. Those derived from ferrous salts are less rich in chromium than those from ferric salts, and of the latter the richest are those prepared from the bichromates. The percentage of iron oxide is greatest in the ferrous chromates, and varies from 23 to 26 in the ferric chromates. These iron chromates form a series parallel with that of the corresponding basic sulphates, and are adapted for painting upon earthenware or china (*Comp. rend.*, cxix, 1215).

NICKEL AND COBALT SULPHIDES.—The compounds of sulphur with nickel and cobalt are but little acted upon by hydrochloric acid, even when it is sufficiently concentrated to dissolve readily antimony, tin, or cadmium sulphides, etc., which are completely precipitated by sulphuretted hydrogen, in dilute acid solutions of the salts of those metals. On the other hand, solutions of neutral nickel and cobalt salts containing mineral acids are not precipitated immediately by sulphuretted hydrogen, and not at all in the cold, in the presence of a slight excess of acid.

This contradiction may be explained, according to A. Villiers (*Comp. rend.*, cxix., 1208), by the supposition that nickel and cobalt sulphides, at the moment of formation by the action of alkaline sulphides, are in a different molecular state to that in which we know them, and they may then be attacked by acids, though they are almost immediately transformed into their normal condition. It is suggested that if the sulphides were precipitated at a very low temperature, the assumed change of state might be retarded, and the existence of their unstable modifications be proved. In a subsequent paper (*Comp. rend.*, cxix., 1263) it is shown that the two sulphides, at the moment of their formation, are either incapable of dissolving in alkaline sulphide, or that they change so rapidly into their more definite modifications that they are unaffected by it. The latter conclusion appears to be confirmed by the fact that when very dilute solutions are employed (3 or 4 Cgm. of salt per litre), to which a great excess of soda is added, nickel and cobalt sulphides are completely dissolved by the alkaline sulphide, forming coloured liquids, which are stable even on ebullition.

CALCIUM ETHYLATE.—A specimen of the compound formed by heating calcium carbide, CaC_2 , with absolute ethylic alcohol at 180° has been examined by M. de Forcrand, who concludes that it is not calcium ethylate, $\text{Ca}(\text{C}_2\text{H}_5\text{O})_2$, but an addition compound of alcohol and calcium oxide, $3\text{CaO} + 4\text{C}_2\text{H}_5\text{O}$, formed according to the following equation:— $\text{CaC}_2 + 2\text{C}_2\text{H}_5\text{O} = \text{CaO} \cdot \text{C}_2\text{H}_5\text{O} + \text{C}_4\text{H}_6$. The compound $\text{CaO} \cdot \text{C}_2\text{H}_5\text{O}$ may combine with a greater or less excess of alcohol to form several definite compounds (*Comp. rend.*, cxix., 1266).

ACTION OF MOULD-FUNGI ON ALBUMIN.—M. E. Marchal has tested the changes produced in a 10 per cent. solution of white of egg by the growth of different kinds of mould-fungus. A number of species belonging to the genera *Penicillium*, *Mucor*, *Botrytis*, *Aspergillus*, *Isaria*, etc., possess the power of decomposing the albumin, appropriating the carbon and nitrogen; while other species of the same genera displayed this property but feebly, and others produced only yeast forms. In all cases where decomposition takes place, even when only yeast forms are produced, the albumin is transformed into ammonia. In no case could any production of nitric acid be detected. The species which produced the most rapid decomposition were *Aspergillus terricola* and *Cephalothecium roseum* (*Bull. Soc. Bot. France*, 1894, p. 403).

HELIOtropISM IN PLANTS.—Dr. W. Rothert has recorded the results of a large number of observations on the heliotropic curvature of seedlings. If a portion of an organ is illuminated on one side only, the heliotropic irritation may be transmitted to other portions of the organ which are illuminated either on both sides or on neither. This transmission was observed in all the organs examined, and invariably in the basipetal direction. It takes place through the fundamental parenchyma, the vascular bundles taking no essential part in it. As a rule, the entire region over which the curvature extends is heliotropic; but the degree of sensitiveness varies greatly in different parts of the organ. It

is only a very short apical region in which heliotropic sensitiveness is very strongly marked. The author distinguishes between heliotropic sensitiveness and irritability, these two phenomena being dependent on different properties of the protoplasm. Irritation may be direct or indirect, that is, may be the result of a local sensitiveness, or may be transmitted. The power of heliotropic curvature is dependent on four factors, the anatomical structure, the thickness, the intensity of growth, and the heliotropic irritability of the organ. It is not necessarily dependent on the sensitiveness of the part; the curvature may be the result of an irritation transmitted from another part. For the same reason, the maximum power of curvature does not necessarily coincide with the maximum intensity of growth. The power of heliotropic curvature ceases with the cessation of growth, while heliotropic sensitiveness and irritability are entirely independent of growth, and continue after the power of growth and of curvature have completely ceased. The decapitation of a seedling has two results, a diminution in the rate of growth, and an entire destruction of its heliotropic and geotropic sensitiveness; but both effects are only temporary (Cohn's *Beiträge zur Biologie der Pflanzen*, 1894, Heft. 1).

INFLUENCE OF DIFFERENT RAYS OF LIGHT ON PLANTS.—Herr E. Wollny finds that yellow light has the greatest power of producing organic substances in plants; next the red; while blue light has a remarkably prejudicial effect on the development of the reproductive organs. It is, therefore, the most refrangible (chemical) rays which take the least part in metabolism, the assimilation of carbon being carried on mainly by the less refrangible (illuminating) rays (Wollny's 'Forschungen,' 1894, p. 217). As the result of another series of experiments, M. Villon states that the vine produces a greater weight of grapes, which also contain a larger quantity of alcohol and of acid, when grown behind glass coloured red-violet by manganese, which absorbs the yellow and brown rays. Flowers are also favourably influenced by the same colour, which is, moreover, advantageous to the growth of bacteria, yeast, and silkworms (*Revue Scientifique*, 1894, p. 460).

GRAFTING OF HERBACEOUS PLANTS.—As the result of a series of experiments, chiefly on Cruciferae and Leguminosae, M. L. Daniel states that graft-hybrids may be produced in herbaceous plants; and that these can be endowed with new alimentary powers by grafting them on varieties which excel them in this respect, and sowing the seeds produced on the graft. Different plants differ greatly in their power of acquiring new characters. It appears to be especially strongly marked in the Cruciferae. With etiolated herbaceous plants all attempts at grafting were unsuccessful (Bonnier's *Rev. Gén. de Botanique*, 1894, p. 356). Professor H. Vöchting, on the other hand, while he succeeded in grafting *Helianthus tuberosus* on *H. annuus*, states that no graft-hybridisation takes place. Each species preserved fully its own characters; there was no tendency to the formation of tubers on *H. annuus*; nor did this latter produce inulin (*Sitzber. d. Preuss. Akad. Wiss. Berlin*, 1894, p. 705).

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JANUARY 19, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the Editor, 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders must be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, —17, Bloomsbury Square, London, W.C.

CALENDAR FOR 1895.

THE Society's Calendar for 1895, the publication of which is announced in the advertisement columns of this issue, appears at a somewhat earlier date than its predecessor, but this circumstance does not seem to have prejudicially affected the practical value of the work. On the contrary, we are inclined to think that, in many ways, the present edition is distinctly better than the previous ones. We notice that a radical change has been made in the arrangement of the matter. The lists of Members, Associates, and Students of the Society have been removed to the end of the Calendar; not from any disregard of their importance, but simply to facilitate earlier publication. They are now placed with the lists of officers of the Society, Honorary and Corresponding Members, Local and Divisional Secretaries, etc., and are no longer separated from the subscribers to the Benevolent Fund, as heretofore, by many pages of other matter. The local list of subscribers to the Benevolent Fund has disappeared altogether, but its omission can hardly inconvenience anyone, for it was only a rearrangement of the alphabetical list of subscribers; and, moreover, an exactly similar list is always published in the special Benevolent Fund issue of this Journal, which is annually sent to every person on the Register of Chemists and Druggists. A saving of space has thus been effected which will give opportunity for future introduction of additional information on subjects with which pharmacists ought to be conversant.

The Calendar has gained considerably in clearness, and consequently in general utility, by the alterations which have been made in what was formerly the Appendix. Whatever advantage there

may be in printing a series of Inland Revenue General Orders and leaving them to tell their own story, is largely discounted by the confusion to which such a course inevitably leads after a few years. Like other official documents, General Orders are not always remarkable for lucidity, but when Orders which have been superseded are printed with others that are still in force, one is apt to find it rather puzzling to extract the knowledge desired. In this respect the Society's Calendar has long needed revision, and we are glad to notice that in the present edition a very successful attempt has been made to systematise the particulars relating to methylated spirit, and to embody the current General Orders on the subject in a comprehensive form. The article on "The Law relating to Methylated Spirit" is an efficient substitute for the scattered, and often contradictory, regulations hitherto appearing in the Appendix, and those consulting it will be able to obtain a great deal of information with a minimum amount of trouble. The same epitomising treatment, though in a lesser degree, has, with good results, been accorded to the regulations dealing with "Drawback on exported Tinctures," "Essences," and "Perfumed Spirits."

Recent information will also be found concerning medicated wines, juries, metric standards, etc., and a very useful innovation is the introduction of a table of licence duties, with the dates on which each licence expires. When it is considered, too, that the various Acts of Parliament affecting the pharmaceutical calling are likewise included in the Calendar, its claims as a book of reference for chemists and druggists in business will need little emphasis. Those who are not yet in business will, however, do well to peruse its pages. The Regulations of the Boards of Examiners, though, perhaps, not particularly interesting reading to students, are an important supplement to the Questions set during 1894 for the First and Major examinations; whilst the fact that the papers set in the last Scholarship competitions are also contained in the Calendar, together with the School of Pharmacy prospectus, and the questions for the various prizes offered by the Council, should make the book quite worth its published price to youths about to enter on a pharmaceutical career. Considerable care appears to have been taken to keep the Calendar abreast of recent events, and we may instance, by way of illustration, the alteration in the Benevolent Fund Regulation X, adopted at the last Council Meeting; the insertion of Mr. W. WARREN's name in the list of Councillors for 1895, and the omission of the name of Professor FLÜCKIGER from the list of Honorary Members. Altogether, we think the Secretary may be congratulated on the enhanced worth of this year's Calendar.

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

A PARTICULARLY interesting addition has been made to the existing statistics of the results of the new method of treating diphtheria. Drs. WASHBOURN, GOODALL and CHARD, in the *British Medical Journal* of Dec. 22, 1894, record the results of eighty cases in which antitoxic serum prepared at the Institute of Preventive Medicine was employed. Eight of these cases were excluded from statistics because there was some doubt of the diagnosis. Seventy-two cases were clinically typical diphtheria. All the cases were examined bacteriologically, and out of the eighty cases, only sixty gave cultures of the KLEBS-LÖFFLER bacillus when examined after twenty hours' incubation on blood-serum. In thirteen cases the tubes even after three days gave pure cultures of the bacillus, the majority of these cases were of severe type, and four of them ended fatally.

It is well known that the form assumed by the diphtheria-bacilli is subject to modifications, what may be regarded as the typical form in stained preparations reminds the observer of the tubercle bacillus, i.e., there is an alternation of darker and lighter points in the slender rod. But the typical diphtheria bacillus is of the same length as, but somewhat broader than, that of tubercle. In three of the cases under consideration the short variety of the bacillus was found—these three were mild cases. In ten cases the medium variety was present, half of them being mild. The ordinary long form of the bacillus was present in the remaining cases, most of which were above the average in point of severity. Thus the authors observe that the short modifications of the bacillus seem to entail a less severe course of the disease than the ordinary form. The authors record also the nature of the concomitant organisms. The BRISCOU coccus occurred in three cases, staphylococcus aureus in two, and streptococcus in forty-five, but in only eighteen of these were the streptococci numerous; of these eighteen cases ten were mild.

The result of the treatment of the seventy-two cases, which had all the clinical features of diphtheria, showed a mortality of 19.4 per cent. against a mortality of 38.8 per cent. in the same number of cases admitted previous to the arrival of the antitoxin, and a mortality of 41.8 per cent. in another series of 397 cases, and 36 per cent in another group of 400 cases of clinical diphtheria treated previously at the same institutions without antitoxin. Of the sixty-one cases in which the diphtheria bacillus was found, thirteen died; a mortality of 21.3 per cent. Of the series of sixty-one cases, nine required tracheotomy, and of these nine but three died, whilst in thirteen previous series of nine tracheotomies for diphtheria there was an average mortality of 7.26. With regard to the

alleged drawbacks of the method, namely, inflammation at the seat of inoculation and symptoms of intoxication, the former were altogether absent, and the latter consisted of a slight rash, which occurred in one case out of four, and in six cases there was pain in some of the joints, which lasted for three days. These phenomena were in proportion to the amount of serum used, and the stronger the antitoxic powers of the serum, i.e., the smaller the required dose, the less marked were the toxic phenomena. It was admitted by all who took part in the discussion on these results at the Clinical Society that there could be no doubt that the remedy had greatly diminished the mortality.

WHAT IS ADULTERATION?

SOME years ago, when the subject of adulteration was being discussed in the House of Commons, the late JOHN BRIGHT said he regarded adulteration as a form of competition, but it did not appear whether this somewhat ambiguous remark was intended as an excuse for adulteration or a censure of extreme competition. A similar view of the matter appears to have been taken by Mr. FLOWDEN in deciding the case brought before him at the Marylebone Police Court in regard to the material known as "flannelette." The prosecution instituted under the Merchandise Marks Act was based upon the assumption that the name given to the article is suggestive of a similarity to flannel. But since the flannelette consisted entirely of cotton, it was inferred that the use of this name was deceptive. The Magistrate's decision is that the application of the term "flannelette" to an article containing no wool is not a false trade description in the sense required by the Act, and that there is no legal ground for complaint unless it can be shown that the public was deceived. He held that if flannelette answered all the purposes of wool by reason of its warmth, lightness, and softness, and had been accepted, at a lower price than flannel, as good value for many years, the public could not have been grossly deceived. The fact that the prosecution had been instituted by Lancashire flannel manufacturers, who have found their business affected by the sale of "flannelette," was referred to by the magistrate, and no doubt it had some influence upon his decision. But after making due allowance for that circumstance, it is probable that the decision of the case will be regarded as possibly having an undesirable tendency. The authorities charged with the administration of the Food and Drugs Act may be reasonably apprehensive of encountering obstructions of a similar nature, if substitution or admixture is to be made free from the penalties of that Act by the use of a diminutive termination added on to the names by which articles of food, drink, and drugs are generally known. This view of the matter does not,

however, appear to have been considered so much as may eventually be necessary, but as it is probable there will be an appeal from the magistrate's decision, further comment may be deferred.

REVOCATION OF PATENTS.

In the digest of patent cases published in the official journal of the Patent Office, an account is given of the cases recently instituted by the Pharmaceutical Society, and mention is made of Mr. Justice NORTH having "incidentally stated" in *VAISEY'S* case that in his opinion "the fact of a patent being taken out to evade the provisions of the Pharmacy Act, 1868, was not a ground for revocation." According to the verbatim report of that case (see *ante*, p. 128), Mr. Justice NORTH's remark scarcely went so far, and, in any case, it involved the assumption that a patent for medicine containing a scheduled poison would be a legitimate ground of exemption from the Pharmacy Act. That, however, is the real question which has yet to be decided. The summary of these cases represents, as the present position of the matter, that "the only grounds for revocation of a patent are those specified in the Patents Act, 1883, section 26, and the fact that a patent is taken out to evade the provisions of the Pharmacy Act, 1868, is not a ground for revocation." Without pretending to question that view, it may, however, be pointed out that procedure for revocation may be altogether superfluous, inasmuch as the formal grant of a patent is always conditional, and it declares that if at any time during the term for which the patent is granted it be made to appear that the "grant is contrary to law, or prejudicial or inconvenient" to the public, the "letters patent shall forthwith determine and be void to all intents and purposes." To sell medicine containing poison within the meaning of the Pharmacy Act, otherwise than as that Act specifies, is contrary to law. Consequently, it would appear that a patent granted since the passing of that Act for medicine containing such a poison must be naturally void, *ab initio*, and that the exemption of such patent medicines in section 16 can only have a retrospective application. The invalidity—on that ground—of patents for medicine containing poison, appears, therefore, to be the point to which legal action should be directed, and that would seem to be a simple mode of doing away with the obvious inconsistency which would otherwise exist between the provisions of the Pharmacy Act in regard to patent medicines and the restriction of the sale of poisons, which is the main object of the Act.

Another statement in the digest now referred to, relates to the *PIPER* case, which is represented as having "decided that medicines entitled to be called patent medicines were not within the provisions of the Act." The judg-

ment in the *PIPER* case did not really touch the question as to patent medicines, which has been raised by attempts to evade the Pharmacy Act by taking out patents, and it merely decided that proprietary medicines which are not the subject of letters patent, are not patent medicines within the meaning of the Pharmacy Act. That point of the judgment is more correctly recorded in *I. Q. B.*, 1893, page 686, by the statement that it was held that the exemption in section 16 of the Pharmacy Act extends only to medicines which are the subject of letters patent, and not to proprietary medicines.

THE SALE OF POISONS.

In answer to a correspondent—who holds the qualification of assistant by examination of the Society of Apothecaries, and is engaged as an assistant to a licentiate of that body—the *British Medical Journal* expresses the opinion that he would be protected in selling paregoric and other scheduled poisons, "provided that, if the employer keeps an open shop, the regulations of the (Pharmacy) Act as to sale of poisons are complied with." It may be pointed out, however, that the exemption referred to applies only to legally qualified apothecaries or other legally qualified medical practitioners. The assistant qualification possesses no value whatever under the Act, and the person holding it would be liable in the event of his selling any scheduled poison, except under the personal supervision of his qualified employer.

STANDARDS OF PURITY IN AMERICA.

THE State Food Commissioners in Ohio, U.S.A., are taking special steps to enforce the law dealing with the adulteration of medicines and foods. According to the *Bulletin of Pharmacy*, any drug may be considered impure and adulterated in Ohio, first—if, when sold under or by a name recognised in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity laid down therein; secondly—if, when sold under or by a name not recognised in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity laid down in such works; thirdly—if its strength, quality, or purity fall below the professed standard under which it is sold.

THE PHARMACIST'S DUTY.

THE *Pharmaceutical Era* remarks that, for his own protection and for the maintenance of his professional dignity, the druggist must test his purchases, sell them for what they are, and refuse to handle all secret preparations whose manufacturers will not secure him against prosecution or adulteration and misrepresentation. It is also pointed out that druggists who are honest with themselves, and wish to do what is right (in a moral as well as in a business way), can do much to hasten the day when tampering with food and drugs will become increasingly difficult and dangerous, by beginning at home and examining their own stocks.

CALENDAR OF THE PHARMACEUTICAL SOCIETY.

PERSONS desiring copies of the Calendar should apply to Mr. RICHARD BREMIDGE, 17, Bloomsbury Square, W.C. The price of the book is 2s., and we note that subscribers to the Society are not required to pay the postage on copies purchased by them.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 16th inst., the Librarian and Curator presented the following report of donations to the Society's Library, Museum, and Herbarium:—

To the Library in London.

Botanical Society of Edinburgh:

Transactions and Proceedings, vol. 19, pp. 233—end; vol. 20, part 1.

George Watt, Esq., M.B., C.M., C.I.R., Calcutta (Corresponding Member):

Agricultural Ledger, 1892, nos. 1-4; 1893, nos. 1-14, 16-20; 1894, nos. 1, 2, 4, 6. 2 copies.

Royal Medical and Chirurgical Society of London:

Medico-chirurgical Transactions, vol. 77.

J. H. Maiden, Esq., Sydney (Corresponding Member):

Agricultural Gazette of N. S. Wales, Jan. Oct., 1894.

Koleniaal Museum, Haarlem:

Nuttige indische planten door Dr. M. Greshoff, Afevering 1, 1894.

Direktour van 's Lands Plantentuin, Buitenzorg:

Mededeelingen uit 's Lands Plantentuin, no. 18.

Allgemeiner österreichischer Apotheker-Verein:

Zeitschrift for 1894.

Alumni Association of the Philadelphia College of Pharmacy:

Report, vol. 30, nos. 4, 6-7; vol. 31, nos. 1-3.

The Proprietors of the American Druggist:

Numbers for 1894.

Philadelphia College of Pharmacy:

American Journal of Pharmacy for 1894.

Annual Announcement, 1894.

Society of Public Analysts:

Analyst for 1894.

The Publishers of the Archiv for Pharmaci og teknisk Chemi:

Numbers from October, 1893, to July, 1894.

Pharmaceutical Society of Australasia:

Australasian Journal of Pharmacy for 1894.

Annual Report for 1894.

British Medical Association:

British Medical Journal for 1894.

The Editor of the Canadian Pharmaceutical Journal:

Numbers for 1894.

The Editor of the Chemical News:

Numbers for 1894.

Chemical Society of London:

Journal for 1894.

Proceedings for 1894.

List of officers and fellows, 1894.

The Proprietors of the Chemist and Druggist:

Numbers for 1894.

Chemists' and Druggists' Diary, 1895.

Mr. H. Helbing:

Helbing's Pharmacological Record, 1894, nos. 25-26, 28-31.

Institute of Brewing:

Transactions for January to June, 1894.

Kaiserliche Akademie der Wissenschaften in Wien:

Anzeiger, mathematisch-naturwissenschaftliche Classe, 1894.

Sitzungsberichte, Chemie, 1893, 1-7. Heft.

Linnean Society of London:

Journal, Botany, for 1894.

Proceedings, 1888-90, 1892-93.

List, 1894.

Manchester Literary and Philosophical Society:

Memoirs and Proceedings, ser. 4, vol. 8, nos. 1-4.

The Publishers of the Ny pharmaceutisk Tidende:

Nos. 21-26, 1893; nos. 1-13, 1894.

Pharmaceutical Society of New South Wales:

Pharmaceutical Journal of Australasia, 1894.

Pharmacie Centrale de France:

L'Union pharmaceutique et le Bulletin commercial for 1894.

Royal Photographic Society of Great Britain:

Journal and Transactions for 1894.

Royal Botanic Society of London:

Quarterly Record for 1894.

The Director of the Royal Gardens, Kew:

Bulletin of Miscellaneous Information for 1894.

Royal Society of London:

Proceedings for 1894.

Société française de botanique:

Revue de botanique, July 1893 to April 1894.

Society for the Advancement of Medical Science in Japan:

Sai-I-Kwai, Medical Journal for 1894.

Society of Chemical Industry:

Journal for 1894.

The Editor of the Timehri:

Part 1 for 1893; part 1 for 1894.

The Proprietors of the Western Druggist:

Numbers for 1894.

To the Museum in London.

Sir F. von Mueller, K.C.M.G., M.D., F.R.S., Melbourne.

Specimen of the resin of *Callitris parlatorei*.

Messrs. W. J. Bragg and Co., Liverpool.

Specimens of the leaves and fruits of *Pilocarpus jaborandi* and of the leaves of *P. trackylophus*.

To the Herbarium.

Mr. J. Medley Wood, A.L.S., Natal.

Specimens of *Anemone fannini*, *Artemisia afra*,

Erythroxylon pictum, *Graderia scabra*, *Piper capense*,

Phytolacca abyssinica, *Ranunculus pinnatus*,

Strophanthus capensis, *Syncolostemon densiflorus*,

Tarochonanthus camphoratus.

Mr. Thos. Hanbury, F.L.S., La Mortola, Italy.

Specimen of *Pilocarpus pennatifolius* in fruit.

The Rev. J. S. Roberts, Jamaica:

Smokers of *Echeneis remora* used in asthma, etc., in Jamaica.

To the Library in Edinburgh.

Alumni Association of the Philadelphia College of Pharmacy:

Alumni report, 1893-94.

Pharmaceutical Society of Australasia:

Australasian Journal of Pharmacy for 1894.

Pharmaceutical Society of New South Wales:

Pharmaceutical Journal of Australasia, 1894.

Mr. D. McGlashan, Edinburgh:

Pharmaceutical Journal, 1894.

EXAMINATIONS IN LONDON.

January, 1895.

(Concluded from p. 596.)

MINOR EXAMINATION—PASS LIST.

Candidates examined 234

„ failed 152

„ passed 82

Green, James.

Marshall, G. G.

Nall, Walter.

Neave, R. G.

Owen, J. E.

Padwick, T. P.

Prosser, H. H.

Reckless, W.

Reeves, R.

Roberts, J.

Skitt, J. H.

Smith, R. E.

Snow, W. J.

Spencer, W.

Stevenson, G. M.

Stone, E. S.

Stone, G. P. R.

Tate, Anthony.

Taylor, T.

Whaley, C. H.

Wilkinson, G. H.

Williams, R.

Wood, J. W.

Wray, G. W.

Younger, T. B.

Younghusband, W. H.

FIRST EXAMINATION.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination:—

Bastow, Sidney London.
 Coleman, Joseph Bishop Stortford.
 Collins, Richard Arthur Nelson.
 Dobie, James Turner London.
 Edwards, William Richard London.
 Ellul, Lawrence London.
 Forster, Horace Reginald W. Chatham.
 Gray, Francis George Birmingham.
 Heywood, Robert Tracey Wrexham.
 Hoddinott, Evan James Lechlade.
 Hudson, Sidney Charles London.
 Hughes, Edward Davies Bodelern.
 Knowles, John Thomas Lancaster.
 Lawson, John Leeds.
 Platt, George Ashton-under-Lyne.
 Reynolds, Edward Stow-on-the-Wold.
 Robinson, Ernest Temple Harrogate.
 Saunders, Alfred Woods Maldon.
 Sawbridge, Frederick Bertie Coventry.
 Shea, William A. Lambert Brighton.
 Shmwell, James Hugh Buxton.
 Thomas, William Henry Blandford.
 Walsley, Martyn Kingston-on-Thames.

Proceedings of Societies in London.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, January 10, Mr. H. T. Durant, vice-president, in the chair.

A paper was read on

VINEGAR.

BY W. H. MAUNDER.

After alluding to the origin of the name, and the fact that the use of vinegar was probably as ancient as that of wine, the author proceeded to describe malt vinegar and its preparation, comparing it with the brewing of beers and pointing out the differences in the two processes and their reasons. The chemical reactions involved were explained, and the constituents of the finished product enumerated. The differences between malt and wine vinegars, and the principal methods of manufacturing the latter were also described.

A discussion followed, in which the Chairman, Secretary, Messrs. Davis, Bastow, and Tunbridge took part.

A paper followed on—

ELECTRICITY IN RELATION TO CHEMISTRY.

BY F. F. A. TUNBRIDGE.

The gradual development of the science of electricity, especially in its chemical aspects, was traced, starting with the electrolysis of water by Delmann and Piets van Trostwijk, in 1789, by means of frictional electricity, and the well-known experiments of Galvani and Volta, from 1790 onwards. The decomposition of water with the voltaic pile by Nicholson and Carlisle in 1800, the discovery of potassium by Sir Humphrey Davy in 1807, and the influence exerted by these and similar experiments on the chemical theories of the period were alluded to. Berzelius's binary

theory was also discussed somewhat fully. The researches of Faraday, and, later, of Hittorf, into the laws governing electrolysis, were described, and the distinction between the primary and secondary effects of electrolysis illustrated. The light thrown by this means on the disputed composition of "double salts," such as platino-chloride of sodium, was mentioned, and the electro-chemical theory of solution propounded by Arrhenius discussed. The ordinary primary batteries, as well as gas batteries and secondary batteries or accumulators, were briefly described and illustrated by examples; the applications of the current to various metallurgical and industrial purposes, such as the production of aluminium, copper, gold, and other metals, caustic soda and chlorine, ozone, the treatment of sewage, the maturing of wines, electrotyping, etc., were all touched upon, and various applications, both qualitative and quantitative, in analytical chemistry.

A short discussion followed, and the meeting then adjourned.

ROYAL INSTITUTION.

On Tuesday afternoon Professor Charles Stewart delivered the first of a course of twelve lectures on the internal framework of plants and animals.

Protoplasm, which the professor said had been aptly termed the physical basis of all life, was first described, and the principal theories that are held regarding its internal structure, the distribution of spongioplasm and hyaloplasm, and the life and growth of the protoplasm were discussed. Pointing out that the latter, which has the consistence of weak gum, would, if unsupported, sink to the ground as a jelly-like mass, the lecturer showed the necessity for some supporting framework in order that living bodies might assume the various positions in which they may readily obtain the necessary food. Usually the protoplasm provides itself with an elastic membrane, the cell wall, and in some cases this provides sufficient support. The structure of a seaweed was illustrated by a description of a *Delesseria* and a *Fucus*. Professor Stewart then showed that the cell wall may be strengthened by becoming thicker and harder, and by having the substance known as lignin, or, as he preferred to term it, "lignone," deposited in it. The club-moss was selected as a suitable object on which to demonstrate the typical structure of some of the lower classes of plants. The distribution of the phloem, which is soft, and the xylem, or hard woody tissue, was explained, and it was shown that these tissues are surrounded by a sheath of sclerenchymatous fibres acting as a mechanical support. A tree fern formed the subject of the next illustration, and the position in such a plant of the various tissues already alluded to was entered into. In this case the connections which exist between the strands of these tissues in the stem and those in the leaf were indicated, as well as the course which is followed by the former. Lastly, a palm was selected for the study

of these strands of tissue or vascular bundles in the stem and their passage to the leaves. In each case the internal framework was the part upon which particular stress was laid.

The lectures were illustrated by sketches upon the blackboard, which the lecturer executed in coloured chalks with consummate skill. Several preparations were also exhibited under the microscope.

Provincial Transactions.

PLYMOUTH, DEVONPORT, STONEHOUSE, AND DISTRICT CHEMISTS' ASSOCIATION.

A special meeting was held at the Foresters' Hall, Plymouth, on Wednesday, the 9th inst., at 2.30, for the purpose of passing the revised rules as drawn up by the Committee. Present—Messrs. C. J. Park (chair), J. G. Netting, R. F. Roper, Condy U'Ren, R. H. Rendle, H. O. Hodge, A. D. Davey, Green, Weary, Jas. Cooks, F. Maitland, and P. A. Kelly. Subsequently the usual quarterly meeting was held, and after the general business, and the election of three new members, an instructive paper entitled, "Some Suggestions for and a Better Means of Consolidation for those engaged in Pharmacy," was read by Mr. P. A. Kelly.

In this the author attributed many of the present difficulties of chemists and druggists to apathetic neglect of their own interests. The Pharmaceutical Society was stated to be unfairly charged with not doing what pharmacists themselves should do. Someone had said that chemists sold in pennyworths, and seemed also to think in pennyworths, and this was not altogether inappropriate in certain cases. A consolidation of forces was necessary, and local associations should do more to contribute to this result. All who now grumbled at the Pharmaceutical Society should join its ranks, as they had no just or honest right to complain under present circumstances.

Mr. J. G. Netting thought there was a good deal of truth in what Mr. Kelly had said, which was very apparent in associations, for the utmost apathy was shown in attending meetings. He thought a lot of the ill-success in business was due to chemists being generally almost utter strangers to one another.

Mr. Cooks thought almost the only remedy, to hope for a better state of things in the future, was in association, for the purpose of buying, defence, harmony etc. A series of articles had been running in *Pearson's Weekly* how best to run various businesses, written by the respective editors of trade papers, and they one and all advocated associations, for the purpose of buying, controlling retail prices, etc.

Mr. Maitland strongly believed in associations, and that members should not be alarmed if the meetings were occasionally breezy, provided they were not personal, which he greatly objected to.

Mr. Rendle expressed great pleasure at the contents of Mr. Kelly's paper, and thought there was much in it to take home and digest.

Mr. Park quite agreed with Mr. Kelly as to chemists' apathy, and believed in fairly strict examina-

tions, as contributing to the safety of the public, not that it gave any monopoly as in some countries; he thought by association chemists might hope to combat the enemies to the trade.

Mr. Roper thought chemists frequently made a great mistake in leaving their shops in the hands of apprentices, as compared with stores which invariably employed qualified men, and that the former should endeavour to be courteous to those customers coming after hours, which gave them an advantage over the latter.

A vote of thanks for his very able paper was proposed to Mr. Kelly by Mr. R. H. Rendle, seconded by Mr. Roper, and carried unanimously.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on the 10th inst., Mr. John Foster, vice-president, in the chair, the following paper was read:—

LABORATORY NOTES AND SUGGESTIONS FOR THE REVISED PHARMACOPOEIA.

BY THOMAS DUNLOP.

When I selected the first part of my subject for to-night, I was influenced by two things—first, a remark made by our president after the Court of Session decision in the Tomlinson case, viz., "Now that we know what the law is, we will require to see that we keep our own doorstep clean"—that had reference to our relation to the Pharmacy Act; secondly, a trade advertisement, which, in referring to the prosecution of chemists for selling defective drugs, said: "No pharmacist looks his best when he figures in a police court to defend a charge of selling inferior drugs"—that had reference to our relation to "The Sale of Food and Drugs Act."

In reading the reports of prosecutions under the latter Act, I have often felt that it was a reflection upon us as educated men when the defence is couched in such words as, "I was not aware of the admixture." Recently a Sheriff replied to this defence, "It is necessary that when people go to a chemist's shop, especially, they should get precisely the article they ask for, whatever they pay for it."

We know how much sophistication is rife, and we ought to make it part of our business to see that our goods are "of the nature, substance, and quality demanded." This duty would be less arduous, or not at all necessary, were an A1 brand of drugs and chemicals our only source of supply, but as long as we can get Turkey colocynth, and colocynth pulp—almond oil and almond oil, exotic (which is not almond oil at all), annual and biennial henbane, etc., etc., we will have no end of trouble. The Act says, "No person shall mix or powder any drug with any ingredient or material so as to affect injuriously the quality or potency of such drug, with the intent that the same may be sold in that state, and no person shall sell." That being law, how does it come to pass that the onus falls on the retailer only?

It is my practice from time to time to examine the

drugs and chemicals that I meet with in the course of business, but during the past few months I have given this more attention for the purposes of this paper, and for that reason I procured trade samples. My examination has been both microscopical and analytical. Speaking generally, everything was good. That being so I will confine my "Notes" to three articles—two of which have been the ground of frequent prosecutions, and the third might become so any day.

Spiritus ætheris nitrosi has been specially studied. This article has been the subject of much investigation, and a rock of offence to many a chemist.

In August, 1885, G. E. Perry reported in the *Pharmaceutical Journal* that spirit which on May 6 contained 4.10 per cent. of nitrous ether, had by July 23 lost 2.33 per cent., whilst the Winchester containing the remainder of the spirit (which had been kept in the cellar), had only lost .52 per cent. Symons, a week later, reported his experience, which was that he kept it almost unimpaired by storing it in small bottles in the cellar—the bottles being corked with paraffin-coated corks—stored thus for thirteen months it still contained 3 per cent. Latest of all are H. W. Jones' observations at the recent British Pharmaceutical Conference, which were not so much to find how to prevent deterioration as to note the rate at which it occurred. The discussion tended to point to buying in small quantities as the only safeguard.

My observations have been in both directions. The test I used was Proctor's. I stocked a pint of spirit on Oct. 23 last.

On Oct. 25 when tested it was normal. I then put—

8 oz.	into a clear 1 lb. chloroform bottle.		
8 oz.	" blue	"	"
2 oz.	" clear 2 oz. stpd.	"	"
3 oz.	" blue $\frac{1}{2}$ lb.	"	"

The first two were placed on the first shelf and 18 ft. from the window, the third was kept on the top shelf and 18 ft. from the window, and the fourth was kept in a dark press.

The first two were tested weekly from Nov. 8 with the following results:—that by Nov. 29 the contents of the clear bottle were useless, whilst the contents of the blue bottle, although below normal, were still usable. By Dec. 27 the contents of the clear bottle gave no reaction when the whole of the test was added, whilst the contents of the blue bottle had only reached the useless stage.

On the latter date the contents of the other two bottles were also examined. In the interval they had been unopened. The contents of the 2 oz. clear bottle were found to be useless, whilst those of the $\frac{1}{2}$ lb. (blue) bottle were still normal, although weaker.

When examined to-day at the end of another fortnight it was unchanged.

The deduction from these observations is that to reduce the deterioration of *spiritus ætheris nitrosi* to a minimum it should be kept in dark coloured bottles excluded from light and heat.

I tested five samples procured in different parts of the city. Results:—One, over normal; one, normal; one, just normal (a day or two would have been suffi-

cient to have put it into a lower grade); one, below normal, but usable; one, quite useless (gave no reaction when the whole of the test was used).

Almond Oil.—I examined eight samples of this oil. Three were English oil; five were exotic. Of the five two seemed to be a mixture of oils.

Exotic almond oil is known to be peach-kernel oil. Its identification is so easy that even although it was substituted for English oil there would be no difficulty in detecting it. In the case of almond oil, no defence can be put forward, as we are not in the case of *cera alba*, bound to stock an adulterated or substituted article.

Milk of Sulphur.—Sulphate of calcium has apparently now no existence in this except in name. It is not even mentioned in some wholesale price-lists, whilst others quote milk of sulphur as sulph. precip. imp. That being so, proves my argument that if only pure drugs and chemicals were to be had the conduct of our business would be materially lightened.

Five samples examined were all found to be pure sulphur precip. My investigation shows that in one case an impure article has now practically no existence, in another the balance is nearly one to two on the wrong side, whilst in a third (which to begin with may be genuine), in the short space of less than five weeks, it will, with careless keeping, have become useless.

In concluding this part of my paper, I think that an apology to the trade for trespass (?) is unnecessary, as my "Notes" were made simply with the desire to find whether, as far as pharmacy in Glasgow is concerned, its members are doing their best to secure that public confidence which is one of the foundation stones of success: in other words, whether, not only as regards the Pharmacy Act, but also as regards the Sale of Food and Drugs Act, the doorstep is being kept clean without the superintendence of a sanitary inspector.

I will now briefly bring before you "The Suggestions for a Revised Pharmacopœia" that I have to make. The suggestions do not affect the Pharmacopœia either by way of addition or deletion, as they deal exclusively with "processes" at present official, which, I think, might with advantage be modified or altered, and in some cases made more explicit.

Acetum Scillæ.—Suggestion: Make with bulb "cut small" (not "bruised," as at present ordered), and, as recommended already, use the acid. acet. dil. 1 in 6, and dilute to 8 before using. Made thus it is less mucilaginous and keeps better.

Glycerin Preparations.—With the exceptions of *glycerina amyli*, *plumbi subacetatis*, and *tragacanthæ* (which are special preparations for special uses), they should be of a uniform strength by volume. At present the strength varies from 1 in 4 $\frac{1}{2}$ to 1 in 6 $\frac{1}{2}$. A strength of 1 in 6 would be preferable, and by such a change *glycerinum boracis* would be improved, the abstraction of $\frac{1}{2}$ oz. of water better adapting it for some of the uses to which it is put, and for which it is unfitted by the addition of such a large proportion of water as was introduced into it in the 1885 Pharmacopœia. Liquors, essences, spirits,

tinctures, and decoctions have a constant volume strength, and I have failed to see why glycerin preparations should be an exception.

Infusions.—The addition of concentrated infusions has been advocated. I dissent from that proposal. I would rather the concentrated infusion had no existence. When a medical man orders an infusion, I think a diluted liquid extract ought not to be supplied. The quality of the (so-called) infusion is impaired by the prolonged exposure to heat to which it has been submitted during concentration, and in the case of drugs containing volatile ingredients, these are dissipated—e.g., inf. buchu, gentian. co., etc. In the present Pharmacopœia the time of infusing was reduced so as to foster the dispensing of freshly-made preparations, and I think no exception can be taken to the time being too long. There are twenty-eight infusions. Of these 5 are infused for 15 minutes, 17 for 30 minutes, 5 for 60 mins., and 1 for 120 mins.

In a recent pharmaceutical editorial were the words, "Whilst there is every reason for endeavouring to ascertain methods by which better preparations may be obtained, there is no legitimate ground for ignoring the Pharmacopœia in respect of what it renders official." It has not been proved that concentrated infusions are "better preparations," and their indiscriminate use is a constant "ignoring" of the Pharmacopœia.

Oils (fixed).—At present we have only "characters" given. I would suggest that "tests" also should be given.

Oleate of Mercury.—Suggestion: A 20 per cent. strength as better keeping, and dilute with oleic acid or, preferably, vaselin. Ordinary paraffin. melle does not do, as it reduces the oleate. There is a specimen of a 20 per cent. oleate on the table.

Ointments.—The ointments having the paraffins as a base are, I think, too hard. The relative proportions might be altered. Not being unctuous, they make a bad combination *per se*. Mr. Boa, when addressing the Edinburgh District Trade Association, said, with reference to official preparations:—"In official medicines we want uniformity—that I assume is the object of having a Pharmacopœia"; and again, "Preparations sold as pharmacopœial should be made according to the official processes, unless we want to create misgivings in the minds of prescribers and patients, and give trouble to our fellow-chemists." But if the Pharmacopœia gives no "process," as is the case with thirteen of the ointments, how can "uniformity" be attained? An ointment made on a slab or in a mortar does not admit of comparison with one made by adding the medicament to the melted base—where that is practicable. The former is always a mechanical mixture; the latter is, in many cases, a solution.

Illustrating this you will find on the table specimens of gall and opium ointment, one made on a slab and the other by adding the powders to the melted benzoated lard. You will also find a specimen in which the opium was infused in the lard (just at the melting point) for an hour, and then the galls added. The latter (as in well-made Dover's powder)

shows no trace of the opium, and in practice I am confident it will be more potent as an anodyne. My suggestion as regards this ointment is that the opium should be infused for an hour, with frequent stirring during the time of infusing, and then the galls added and the whole stirred till cold.

Iodide of Potassium Ointment.—Suggestion: Triturate the iodide with 1 dr. of glycerin, add the adeps benz. l., and, lastly, 1 gr. of sodium hyposulphite (dissolved in 5 m. of water) to each oz. I have never found the carbonate of potassium that is official to prevent the discoloration of this ointment. By experiment I have found that it takes fourteen days for the official ointment to become decolorised. I have also found that the present official ointment is much paler in colour if the salts are triturated with an equivalent quantity of glycerin instead of the water ordered, and becomes colourless in a week. As white iodine ointment is asked for, it does not do to send it out saffron yellow in colour, and as its keeping property is impaired by incorporation with so much water, it should be freshly prepared. The hyposulphite addition meets both of these difficulties, and the glycerin is certainly a better addition than water to lard. A specimen of the suggested ointment is on the table—it was made to-day.

Stavesacre Ointment.—Official ointment made from crushed seeds. Finished product stated to contain "10 per cent. of oil." The oil is the known active ingredient—then why not have the formula: Oil 1, benzoated lard 9? The Edinburgh Roy. Inf. Pharmacopœia has such a formula, the strength being 1 in 8, and the ointment perfumed with oil of geranii.

There are thirty-three ointments in the Pharmacopœia. There are specific instructions for twenty, mix thoroughly in twelve, and mix in one. In five of the twenty prolonged maceration in the melted base is ordered. My suggestion for the thirteen (with the exceptions of gall and opium ointment—already referred to—and belladonna ointment) is that the directions given for zinc ointment should be authorised as the "process" for making them.

Pills.—The quantities given of the excipients to be used are indefinite in many cases, "about" or "a sufficiency" being no criterion of the amount required, whilst in some instances where it is specified it has been found to be insufficient, and yet in every case the exact quantity could have been stated. Where "treacle" is ordered I think "syrupus" (B.P.) would be preferable, its consistence being constant and therefore reliable, an element which "treacle" lacks.

Official Excipients.

Pil. aloes et ferri. Confection 4, but 6 required and would give a weaker pill.

Suggestion: Pulv. acac. 1, syrup, $2\frac{1}{2}$ = 4 (about). That maintains the official strength.

Pil. aloes et myrrh.—Treacle 1, glycerin sufficient.

Suggestion: Syrup 1, and divide in 4 gr. pills.

Pil. Coloc. Co.

Suggestion: Spt. ammon. arom., 3 min. to $\mathcal{Z}$ i, gives a soft good-keeping mass with no tendency to pit. Sample at least six weeks' old.

Pil. plumbi c. opio. Confection, 1.

Suggestion: P. acac., glycerin, and syrup each ½.

Pil. rhei co. Treacle about 3 (by wt.), glycerin, 1.

Suggestion: Syrup 1½ (by measure) = 2 by weight, and divide into 4 gr. pills.

I have never found conf. rosæ a suitable excipient for ferruginous or astringent powders. The pulv. acac. gives the necessary adhesiveness and the syrup and glycerin prevent hardening.

Syrup of Iodide of Iron.—Much has been said and written about the preservation of this preparation. Sald. soln. of sugar, the conversion of some of the sugar into glucose (by boiling), the direct addition of glucose, the addition of diluted phosphoric acid, and the storing of it in amber coloured bottles have each, in turn, been recommended.

My suggestion is the addition of 2 min. (per oz.) of hypophosphorous acid. This has the double advantage of high reducing power and forming a soluble salt. On the table are specimens of the syrup, one made on October 25 last, the other made in April last, which have had the usual exposure in the shop stock bottle since then.

Tinctures.—I have only to refer to two—tr. calumb and tr. opii. The former would be better made with rectified spirit, and the latter by the old Edin. Pharm. process.

Christison says of tr. calumb., "A clearer and finer preparation is made by using rect. spt." I have confirmed this. I have always made tr. opii by the Edin. Pharm. process, in which I see nothing "not to be encouraged" (as Mr. Alcock said at the Midland Counties Association meeting on November 8 last). Made by that process, and allowed to stand for seven days after mixing the aqueous and spirituous infusions, the mucilage is thoroughly precipitated, and no further separation takes place after the tincture is expressed and filtered.

In conclusion, I may say that in the cases where I have made "suggestions" or recommended additions as preservatives I have done so not from a manufacturer's point of view, but from that of a pharmacist, and on that account the additions are in infinitesimal quantity, but still capable of producing the desired effect for a reasonable time. I do not think that official preparations should be made in abnormal quantities. Every chemist should make his own galenicals, and, as regards tinctures, store them carefully—by that I mean store them in filled bottles, each of which is emptied when it is opened, ointments, pills, and powders being made frequently to suit trade demands. If this were done there would be fewer difficulties met with, and fewer "improvements" required, as each process would be found to yield a product quite satisfactory for all ordinary purposes.

The limits of my subject are so far-reaching that I have only been able to touch a few of the many points that might have profitably been taken up and more fully inquired into. On this account I have to crave your indulgence for the imperfect and incomplete manner in which it has been dealt with.

Afterwards an interesting discussion took place

amongst the members, in which many of the points brought forward by Mr. Dunlop were discussed. All the speakers seemed to agree in making tr. opii after the manner of the Edinburgh Pharmacopœia. Concentrated infusions were said to be prescribed by some medical men; and they could be made without using heat, or even with heat, and retain all the virtues of their ingredients. Confection of hips was mentioned as an excipient for pil. aloës et ferri, which made a good mass with the B.P. quantity. With reference to spt. ætheris nitrosi, the fact that it was almost invariably received from wholesale houses at a minimum standard showed the impossibility of keeping it up to proper strength, in however small quantities it was stored, when it had to be retailed in smaller quantities. One of the members referred to the time when chemists distilled their own, and could use methylated spirit in making it, as productive of more satisfactory results than at present. Mr. Dunlop replied to the observations passed upon his paper, and was accorded a hearty vote of thanks. Samples were exhibited of syr. ferri iodidi, pil. colocynth co., pil. rhei co., and ung. gallæ c. opio, made by the warm process and by the B.P. method, and the specimens were favourably commented on.

Parliamentary and Law Proceedings.

CASE UNDER THE PHARMACY ACT.

ACTION AGAINST AN UNREGISTERED PERSON.

On Thursday, January 10, at the Oldham County Court, before His Honour Judge Jones, Walter Crompton, described as a drug store proprietor, carrying on business at 14, Market Place, Oldham, and 61, West Street, Oldham, was sued at the instance of the Pharmaceutical Society for the recovery of penalties for having kept an open shop for the retail of poisons, contrary to the provisions of the Pharmacy Act, 1868.

Mr. T. R. Grey, barrister, appeared to prosecute on behalf of the plaintiff Society, and the defendant was represented by Mr. H. H. Waddington, solicitor, Oldham.

Mr. Grey said that the defendant was the owner of two shops in Oldham, and the Society alleged that two offences had been committed at each. With regard to the offences committed at the Market Place shop, the defendant had paid the two penalties into court. He had now to prove that the defendant was the keeper of an open shop at 61, West Street. He should call witnesses who would prove that on August 25, and September 1, purchases were made at 61, West Street, of a bottle of Powell's Balsam of Aniseed, which contained morphine—a poison under the Act. The bottle, when purchased, was wrapped in a hand-bill, upon which was printed "Sold by W. Crompton & Co., Genuine Drug Stores, 14, Market Place, and 61, West Street, Oldham." He should also prove that the name of the defendant, "W. Crompton," was printed on the window of the shop at 61, West Street.

Mr. Waddington, interposing, produced a deed dated January, 1894, showing that the business at 61, West Street had been assigned to another person.

Mr. Grey, on examining the document, said he saw

that the business had been sold to the defendant's brother, who also was unqualified. He complained that this information had been withheld.

His Honour remarked that there ought to have been no difficulty on the part of the defendant in giving that information to the Society, but the defendant appeared to have obstructed it. In the face of that document he did not see how the plaintiff Society could sustain the case, but he should certainly give them all costs and also certify for counsel.

His Honour then entered judgment in favour of the plaintiff Society for the money paid into court, with costs. In the second case—that relating to the West Street shop—he must find a verdict for the defendant, but he should give the Society all costs.

Reviews and Notices of Books.

A TEXT-BOOK OF INORGANIC CHEMISTRY. By G. S. NEWTH. Pp. 667. 6s. 6d. London: Longmans, Green & Co.

The lectures at South Kensington have long been famous for their wealth of experimental illustrations, and we have no doubt that both Professor Frankland and Professor Thorpe are ready to admit their indebtedness to Mr Newth for his services as lecture demonstrator for so many years. This unique experience has given the author special opportunities for sketching out what may be called a systematic course of elementary chemical instruction, and the present text-book makes a fitting companion to his 'Chemical Lecture Experiments,' which were published about two years ago. Although there is no dearth of elementary chemistry text-books, and one is inclined to think that there is scarcely room at present for any fresh books of this character, Mr. Newth appears to have succeeded in producing a text-book having distinctive features of its own which will appeal to a large number of students. Amongst these may be specially mentioned the originality displayed in the experimental illustrations of the fundamental facts of the science. In this respect the author is to be congratulated on making a new departure which will be acceptable to older chemists who may have occasion to glance at an elementary text-book, and will also be useful to the beginner if he be unable to attend lectures at a well-appointed institution, in helping him to form some idea of modern apparatus. Some of the recent elementary text-books, in which an attempt has been made to arrange the elements in their natural periodic order, have given equal importance to all the elements alike, and although this may be defended on scientific grounds, a beginner is apt to become bewildered by the complexity of the subject, and fails to obtain clear ideas on the properties of those elements and compounds which he is most likely to meet with. Mr. Newth has made a judicious compromise by dividing his book into three parts. In the first of these he gives a brief sketch of the fundamental principles and theories upon which the science of modern chemistry is built. In Part II. the four typical elements, hydrogen, oxygen, nitrogen, and carbon, are studied in detail, and afford an opportunity for

discussing such subjects as water, the atmosphere, and combustion, at an early stage of the book, whilst in Part III. the elements are treated according to the periodic classification. In the introductory portion the author has given a very good summary of our present knowledge of the physical properties of gases and such physical phenomena as are of value to the chemist in differentiating the elements and their compounds, the chapters on solution and thermo-chemistry being especially well written. The omission of the name of Raoult and all details of the now important method of determining the molecular weight of compounds with which his name is associated will be noted, in the short paragraph devoted to the effect of substances in solution upon the solidifying point of a liquid. In Part II. one of the best sections is that dealing with the atmosphere, and this subject has been brought well up to date by a note on the new gaseous constituent discovered by Ramsay and Rayleigh. There should have been some mention of sulphur compounds as impurities in town air, and exception must be taken to the phrase that potable water is an article of food to man. Acetylene is found under the title ethine, although no mention is made as to the meaning of this alternative name, and the significance of the suffix and the term acetylene is used throughout in the text. In fig. 68, which is a sketch of an apparatus for the preparation of copper acetylide from the products of the incomplete combustion of coal gas, a condenser should be shown for cooling the gases before passing into the solution of ammoniacal cuprous chloride. Under aluminium the Deville process for obtaining this metal is alone described, although electrolytic methods are now of the greater commercial importance, and, as is usual, several pages are devoted to the Leblanc soda process and the approximate composition of black ash and the usual pictures of a salt cake furnace, while the few lines without any details on the ammonia-soda process leave the student ignorant as to the relative magnitude of these rival methods of alkali manufacture. The possibility of both being replaced by an electrolytic process is not even hinted at. After all, these are but minor points, and can be easily amended in a future edition, which it is hoped may soon be called for.

A TEXT-BOOK OF ORGANIC CHEMISTRY. By A. BERNTHSEN. Translated by Dr. M'GOWAN. Second Edition. Pp. 596. 7s. 6d. London: Blackie and Son.

Professor Bernthsen, of Heidelberg, is to be congratulated on the well-deserved success which has attended his 'Text-Book of Organic Chemistry,' both in its English and German garb. In Germany four editions have been demanded in little over six years, and Dr. M'Gowan's translation has been so well received in this country that he has thoroughly revised the English edition and brought it up to the standard of excellence which obtains in the last of the German editions. Many of the chapters have been more or less re-written, and the sections which deal with the determination of molecular weights by

physical methods, ketonic acids, diketones, the uric acid group, azoles, quinoline, and acridine groups have been much expanded. Since the publication of the first edition there have been several important researches published, which have rendered it desirable to modify some of the sections; thus, for example, the chapters on the sugars and terpenes have been altered considerably, due to the increase in our knowledge of these compounds through the labours of Emil Fischer and Wallach. Kühne's classification of the albumins is also adopted in the section relating to these compounds, and makes the portion of the book relating to the changes which the albumins undergo during fermentation well up to date. The adoption of the new international nomenclature is also a distinct feature of the present edition. At present the authors have, however, wisely refrained from rushing into the new system all at once, and have adopted a compromise which should be appreciated by students during the present transitional period. It is, nevertheless, highly desirable that students should, for example, realise that butane-diol di-acid is a systematic name for tartaric acid which has the approbation of the leading chemists of the world, although we doubt if there are many teachers in this country who have introduced this system into their lectures. It will be seen from the few points which have been alluded to that, as a modern text-book, the present edition is in some respects unique, and it cannot, therefore, fail to find as much favour in this country as the corresponding editions have done in Germany. Dr. McGowan is to be commended on the care which he has shown in editing the book for English-reading students, as it seems to be remarkably free from printer's errors.

THE SENILE HEART: ITS SYMPTOMS, SEQUELÆ, AND TREATMENT. BY GEORGE WILLIAM BALFOUR, M.D. (St. Andrews), LL.D. (Ed.), F.R.C.P.E., F.R.S.E. Pp. i.-xi., 1-300. 5s. London: Adam and Charles Black.

In a well-printed and convenient volume the author gives a full account of the changes which age effects in the heart. Those who have made the acquaintance of that idealistic and unconventional physician, Dr. Pascal, created by Zola, and by the same author's pen made to die of degeneration of the heart, will know what a terrible thing the poor senile heart may be; its arteries narrowed by tumid fatty masses, and its starved fibres looking like autumn leaves, brown, yellow, and dun, in blotches and streaks. Dr. Balfour traces the minor as well as the major ills of the unresting organ in those on the downward path of life, and leaves the reader relieved at finding that not many, though still too many, senile hearts are in as bad a predicament as that of Dr. Pascal. Functional derangements which arise from no morbid change of tissue are the more common. Rational diet and life are the best preventives of these, and should there be signs of organic degeneration, suitable diet and habits may long defer the end of a life, the last stage of which may be passed in comfort even when

some fatty degeneration is taking place. Under the head of treatment we find that digitalis is *facile princeps* of cardiac tonics, but cannot be safely given to senile hearts without simultaneously unlocking the arterioles by such drugs as iodide of potassium or nitrites. For the majority of men preventive measures are alone of interest, and in this connection it is of importance to note the author's experience of the effect of tobacco on the heart: "At universities and schools of medicine where young men congregate and teach each other the habit of smoking there is always ample opportunity of studying the effect of tobacco on the heart. The tobacco heart is neither a functional nor an organic complaint; it is an acute or chronic poisoning of the vagus which may lead to actual dilatation of the heart, and even to death itself."

Correspondence.

THE ATMOSPHERE OF THE SUN.

Sir,—In an able article on "The Possibility of Life in other Worlds," by Sir Joseph Ball, in the *Fortnightly Review* for November last, occurs the following sentence:—"Surrounding that visual globe, the sun, there is an atmosphere of which hydrogen is one of the most prominent components."

If this be the fact, what would be the probable result? May it not rather be inferred that the sun's atmosphere is somewhat analogous to our own, and that light and heat are due to carburetted hydrogen; combustion being supported by oxygen? The late Mr. Proctor demonstrated that the flames emanating from the solar disc are 700 miles in height; how this sublime spectacle can be continued for an indefinite period of thousands of years without diminution, is a problem that no theory of evolution can solve.

Kingston-on-Thames.

R. GOODWIN MUMBRAY.

AQUA CHLOROFORMI AND AQUA CAMPHORÆ.

Sir,—My objections to Mr. Elborne's process for making aqua chloroformi (p. 581) are the want of definite strength and probable variability of the product. The strength and the rate of saturation would vary according to temperature. The time (twenty-four hours) required to make a saturated solution by his process is too long. By the B.P. process, the quantity there ordered can be made by agitation for twenty seconds, and the product is definite in strength. It might be prepared, as is frequently done when chloroform is used for preserving organic solutions, by mixing the chloroform with an equal volume of rectified spirit before addition to the aqueous fluid. By this mode the chloroform dissolves more readily and without much agitation. I have elsewhere (*vide* 'Extra Pharmacopœia') objected to aqua camphoræ being prepared by the B.P. process—the origin of Mr. Elborne's idea—and suggested that it should be of definite strength and made by using a strong alcoholic solution of camphor. The variation of strength of aqua camphoræ B.P., owing to its preparation at a higher or lower temperature, is such as to be noticeable by a patient taking a mixture containing it. I think if aqua chloroformi were prepared so as to contain exactly 1 volume in 200 volumes, and aqua camphoræ 1 in 1000 volumes (*cum spiritu*, as above), more generally satisfactory results would be obtained. Spirit of camphor B.P., too, should be 1 in 10 volumes, and a preparation equal to Rubini's should also be official.

Dose of aqua chloroformi.—I would further urge against the complete saturation of this the fact that as a vehicle it is at present too strong for most persons to be taken undiluted. They complain that it causes unpleasant eructations. 1 in 400 volumes is strong enough to be inhibitory to most germ growths. We rarely have more than a fluid drachm of spirit of chloroform prescribed in a 6 or 8-oz. mixture. This makes a chloroformic solution less than 1 in 400 volumes. As chloroform water is generally used as a vehicle only, it would be better to state the dose as "2 to 8 fluid drachms, diluted."

10, New Cavendish Street, W. WM. MARTINDALE.

Sir,—In your issue of the 12th instant, page 581, is described a rather elaborate process for making the above. Permit me to describe a much shorter one. I mix the chloroform with half the quantity of water required, and violently shake it until the chloroform is in a state of very minute division; the remainder of the water is now immediately added, and after shaking for a minute or two a perfect solution results. In making medicated waters I find the best results are obtained by following the plan devised by the late Mr. Baily, of Margate, and described in his 'Physician's Pharmacopoeia,' page 2, published by Messrs. J. and A. Churchill.

PERCY WELLS.

Cambridge Gardens, North Kensington.

THE REMUNERATION OF PHARMACISTS.

Sir,—I am very pleased with everything contained in the letter from "Riatio" in last week's Journal, and he must be congratulated on his sound method of reasoning, but there is another side also to this much vexed question, with which I am about to deal. The remuneration of pharmacists and company trading to a certain extent go hand in hand. Some time since I was anxious to qualify and it cost me no end of money, time, worry, and loss of health; and what is my reward? My certificate has not up to now brought me in a single penny, because I have done the usual kind of work which I did regularly when unqualified. I will give two instances that occurred to me during the last few days. The principal in the first instance says: "You are qualified, oh, an unqualified man can manage the place just as well for me!" Case number two, a pound a week with small commission and two unfurnished rooms. Now, is it not time to put the screw on tight after this? I have the greatest respect for our Society, and I am grieved to see that chemists are not so liberal towards it as they might be. I should like to ask two questions, as my eyes have been opened lately. How many hundred unqualified men are setting the Pharmacy Act at defiance in London only? How many thousands are doing the same throughout England, Scotland, and Wales? This, I admit is not a consoling reflection; but it is nevertheless true—and many readers no doubt will smile when they read this, and if they felt so inclined, could substantiate this statement—knowing it to be one of the greatest evils with which we have to contend. The common law of England loses none of its dignity because it brings down a heavy punishment on the wrong-doer; and the same can be said of the Pharmacy Act of 1868. I am seriously considering whether it would not be better for me to hire a piano-organ, with an announcement in large type—"Ladies and gentlemen, I am a qualified chemist. There is no further necessity for my services, as the work is now done by unqualified men who break the law with impunity." Now, fancy turning the handle with such strains as "'E danno where 'e are!'" The evils that

exist are bad enough at present, and the future of pharmacy, as predicted by some to be a very brilliant one, will exist in the flight of imagination only unless these obstacles are removed. The motto and passwords should be to treat all in the same way, whether they belong to the Society or not. If I break the law in any way, I expect to suffer; if I set the Pharmacy Act at defiance, I must also suffer. I desire in every way to be loyal to the Society, and if my brother chemists would do the same we should hear very little of company trading, and our future idealistic state be not a dream but an accomplished fact, which we cannot expect by a process of natural evolution. DELTA.

"HABENDA RATIO VALETUDINIS."

Sir,—You may perhaps deem it worthy of note that in Caesar's 'Gallic War,' book 7, chap. 1, line 17, there occurs a sentence which is directly illustrative of the full meaning of our pharmaceutical motto:—"Imprimis rationem esse habendam dicunt ut Caesar ab exercitu intercludatur" etc. "They say that special care must be paid to this that Caesar be cut off from his army" etc. In the light of this I think the full translation of our motto is "We must pay special attention to health." Nor may we forget the full force of *valetudo*, from "*valeo*," implying not simply health but strength and safety, as *vale!* = fare-well! So when our children inquire of us what mean these words, we may truly answer that, "We (pharmacists) must pay special attention to the health and safety of the public."

"Nor do I name the men of common rout,
That wandering loose about
Grow up and perish, as the summer fly,
Heads without name no more remember'd,
But such as Thou hast solemnly elected,
With gifts and graces eminently adorn'd
To some great work, Thy glory,
And people's safety, which in part they effect."

MILTON—'Samson Agonistes.'

West Marylebone.

J. C. HYSLOP.

ADULTERATION OF BEESWAX.

Sir,—Having recently returned from Smyrna, where I had the occasion to analyse many samples of beeswax, and having noticed an article on the same by Mr. John C. Umney in the *Pharmaceutical Journal* of December 22, 1894, I should like to make a few remarks. I quite agree with Mr. Umney that the testing of beeswax should be carried further than that stated in the *British Pharmacopoeia*. Whilst in Smyrna I examined many samples of beeswax, and only found one free from adulterants. Although the adulterant was stearin which I generally found, yet I may say it is an easy matter to overlook the same, if beeswax is not too largely sophisticated and simply the tests of the *British Pharmacopoeia* be carried out.

RICHARD B. G. SILVERSIDES.

Newcastle-on-Tyne.

Notices and Answers to Correspondents.

Mr. Barron, the local secretary for Cheltenham, desires to express his thanks for an anonymous donation of 5s., received on behalf of one of the unsuccessful candidates at the recent election of annuitants under the Benevolent Fund.

COMMUNICATIONS received from Messrs. Andrews, Balmforth, Bayley, Bennett, Blackburn, Cocks, Cole, Clarke, Cracknell, Delancy, Edgeler, Elborne, Hill, Holloway, Inglis, Laing, Line, Lowe, Mumbray, Parker, Peet, Phillips, Reynolds, Rideal, Smith, Walker, Wells.

THE DISCOVERY OF OXYGEN.

(Continued from page 525.)

CARL WILHELM SCHEELLE.*

Born at Stralsund on December 9, 1742, Carl Wilhelm Scheele was a Swedish subject, though of purely German descent. He almost invariably spoke and wrote in German, and the patience, care, and accuracy manifested throughout the whole of his work are in marked accord with what has been done since by German chemists. His father was a tradesman of but limited means, and Scheele, being the seventh in a family of eleven children, enjoyed but limited educational advantages. He was apprenticed to a Gothenburg pharmacist at the age of fourteen, and subsequently acted as an assistant in Malmö, Stockholm, and Upsala, respectively. In 1775 he was nominated "provisor" of a pharmacy at Köping, which he conducted until his death in 1786.

Classical studies did not interest Scheele, and he never studied mathematics. During his apprenticeship, however, he mastered all the standard works on chemistry then available, and planned experiments, the execution of which was of necessity postponed until late at night. Gradually he acquired a considerable knowledge of the properties of chemical substances, besides laying the foundations of a manipulative skill which has probably been unsurpassed by any scientific investigator. He made every compound of the numerous substances he discovered that was possible with the means at his command, and overcame the difficulties caused by the lack of suitable apparatus, by devising ingenious appliances which helped in the elucidation of most abstruse chemical problems. His laboratory has been described as consisting of a furnace, alembic, sandbath, crucible, some phials, ordinary tumbler glasses, and a few bladders to contain gases.

There is now definite proof that Scheele is entitled to be credited with actual priority in the discovery of oxygen (fire-air) by about two years, though his printed account of it did not appear until two years after that of Priestley. Scheele's laboratory notes, preserved in the Royal Academy of Science, Stockholm, show that, prior to 1773, he had obtained oxygen from mercuric oxide, potassium and magnesium nitrates, silver and

mercury carbonates, and other substances. He also discovered chlorine, ammonia, hydrochloric, hydrocyanic, and hydrofluoric acids, and investigated their properties. Manganese and baryta he showed to be individual substances, whilst he investigated the nature of alum, clay, quartz, and silica, and discovered glycerin and several organic acids—citric, gallic, lactic, malic, mucic, oxalic, tartaric, and uric. Indeed, his discoveries were so numerous and varied as to cover the whole range of chemical science. But it was not in recording facts alone that he excelled, for he also invented many new processes, and, by initiating the use of characteristic reactions to detect and separate allied substances, was one of the first to put chemical analysis upon a definite basis.

SCHEELLE ON AIR AND FIRE.

The record of Scheele's experiments on air is



CARL WILHELM SCHEELLE.

found in his 'Chemische Abhandlung von der Luft und dem Feuer,' published in 1777, and translated into English by J. R. Forster in 1780.* At the outset the author remarks that the object and chief business of chemistry is to skilfully separate substances into their constituents, discover their properties, and compound them in different ways, and that the difficulty of performing such operations with the greatest accuracy can only be unknown to those who are entirely or insufficiently acquainted with the subject. He then proceeds to explain the necessity of a knowledge of fire, and states that he undertook a multitude of experiments in order to fathom that phenomenon as fully as possible.

Air he describes as the fluid invisible substance we breathe, which surrounds the whole surface of the earth, is very elastic, and possesses weight. Mixed with it are watery vapour and another elastic substance resembling air, called aerial acid (carbon dioxide), which owes its presence to organised bodies destroyed by putrefaction or combustion. Such substances may consume a part of the air or perceptibly increase its bulk, or neither increase nor diminish a given quantity of it. With regard to the general properties of atmospheric air, fire must burn for a certain time in a given quantity of it; if, during combustion, the fire does not produce any fluid resembling air, the quantity of the latter must be diminished between a third and a fourth part; air must not unite with common water; all kinds of animals must live for a certain time in a

* For more extended biographical accounts of Scheele see the *Pharmaceutical Journal* for January 14, 1893, and Thorpe's 'Essays in Historical Chemistry.' (Macmillan.)

* A modern translation of the essential portions of this work constitutes one of the Alembic Club reprints (W. F. Clay, Edinburgh).

confined quantity of it; and seeds, in a given quantity of similarly confined air, must strike roots and attain a certain height with the aid of some water and a definite heat. When, therefore, a fluid resembling air had not all these properties, Scheele was satisfied that it was not ordinary air.

Air, according to him, must be composed of two kinds of elastic fluids, as proved by the diminution in bulk of a confined quantity of it that occurred when various substances were exposed to its influence,* whilst the same experiments proved that phlogiston, the simple inflammable principle, was present in each case, since he says it is known that the air strongly attracts to itself the inflammable part of substances and deprives them of it, and by the transference of the inflammable substance to the air a considerable part of the latter is lost. Further, a given quantity of air can only unite with and saturate a certain quantity of the inflammable substance. Whether, however, the displaced phlogiston was still present in the air left behind in the containing vessel, or whether the air that was lost had united and fixed itself with the substances experimented on, remained a moot point. Experiments were performed, therefore, with a view to solving the problem.

RESEARCHES ON AIR AND FIRE.

Phosphorus heated in a closed flask was found to ignite and form a white cloud which settled upon the sides of the flask like white flowers, consisting of the dry acid of phosphorus (phosphorus pentoxide), and on opening the flask under water, a certain quantity of the liquid was forced in by the pressure of the external air. A similar result occurred when pieces of phosphorus were simply allowed to remain in a closed flask for several weeks.

Inflammable gas (hydrogen) was generated by acting upon iron or zinc filings with diluted oil of vitriol, in a bottle (Fig. 3, A) through the cork of which passed a glass tube A. This bottle was placed in a vessel, BB, containing hot water, and the issuing gas was ignited, after which the flask C, was inverted over the flame, with its mouth under the surface of the water, which at once began to rise into the flask until it reached the point D. When, however, the flame went out the water was entirely driven out of the flask again and, since the space up to D equalled one-fifth the total contents of the flask, it was thus proved that one-fifth of the air formerly present had been lost during the experiment.

A burning candle was next proved to cause a similar loss of air. A mass of wax, resin, and turpentine, melted together, was pressed upon the bottom of the dish A (Fig. 3, B), and a thick iron wire fastened in it, which reached to the middle of the flask B, and bore at its upper extremity a small wax candle C. The candle was lighted, the flask inverted over it and pressed deeply into the mass, and the dish filled with water. When the flame was extinguished and the apparatus cool, the water was admitted into the flask, and the loss of air again noted. Burning spirit of wine or glowing coals were found to produce a similar effect. In these cases the bulk of air was not so perceptibly

diminished as in the previous experiments, but it was found that this was due to the addition to the contents of the flask of the aerial acid formed during combustion.

Further experiments proved that when the two kinds of elastic fluids constituting ordinary air had been separated "by means of phlogiston," they could be re-combined to form air. Before arriving at this conclusion Scheele had first to face the problem as to the destination of the air apparently lost during the preceding experiments, and then to prepare the two constituents of the air in a pure condition. He objected to the theory that by the union of air with phlogiston it became lighter, phlogiston being a substance—according to him—which always presupposed some weight.

On fuming acid of nitre (nitric acid) being distilled, at first it went over red, then became colourless, and finally it became red again. The receiver was at this point replaced by a bladder containing thick milk of lime to prevent corrosion and the distillation then proceeded with. The bladder gradually expanded by the pressure of evolved gas, due to



Fig. 3.—Apparatus employed by Scheele in his experiments on Air and Fire.

the decomposition of the acid, and this gas was found to support the flame of a candle much better than ordinary air. One part of this gas mixed with three parts of that kind of air (the residual nitrogen) in which fire would no longer burn was like ordinary air in every respect, and since the newly discovered air (oxygen) was found to be necessary for the origination of fire, Scheele named it "fire-air," whilst the inert constituent of ordinary air, left as a residue after burning combustible substances, he termed "vitiated air" (nitrogen).

APPARATUS EMPLOYED BY SCHEELE.

His method of transferring gases from one vessel to another is worthy of description. Soft bladders oiled inside were employed to generate many gases and to collect others. In the latter case a bladder containing milk of lime to absorb any aerial acid

* These were all instances of simple oxidation, liver of sulphur, nitrous air, oil of turpentine, etc., being experimented upon.

(carbon dioxide) evolved, was tied to the neck A of a retort (Fig. 4, C). When a gas was to be generated in a bladder, AA (Fig. 4, D), the chalk or other substance was placed at the extremity of it, the string B was tied just above, the diluted acid then poured in, and the bladder again tied with string at C. The string B was then untied and the acid so allowed to come in contact with the substance, the evolved gas inflating the bladder. To transfer the gas from the bladder to a bottle or other vessel, the latter was filled with water and fitted with a cork. The end D of the bladder was then tied firmly over the bottle neck and the whole inverted. On grasping the cork through the bladder it could be withdrawn sufficiently to permit the gas and water to exchange places, after which it was replaced, the bladder detached, and the bottle placed with its neck under water. Slight variations on these operations were necessitated in certain cases, but the above fairly represents the simple general methods

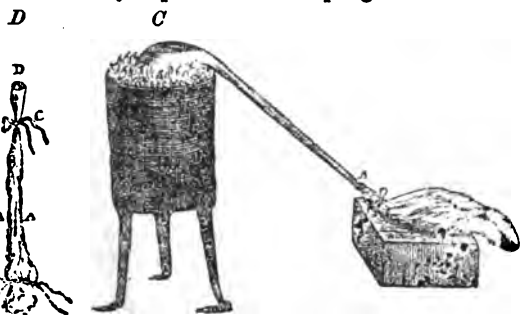


Fig. 4.—Apparatus employed by Scheele in his experiments on Air and Fire.

employed by Scheele in his investigation of air. He admits that they may not particularly please some individuals because they do not decide with great exactness, but remarks that they afforded him satisfaction in all his investigations; "and people will often split a hair where it is not in the least necessary."

FURTHER EXPERIMENTS.

Other substances from which Scheele afterwards prepared his fire-air, were manganese and oil of vitriol, magnesia, nitre, red precipitate, arsenic, silver, magnesium and mercury nitrates, etc., etc. He proved that the gas obtained was in all cases identical with the constituent of ordinary air that disappeared in his earlier experiments; the effects observed on repeating those experiments, with the fire-air substituted for ordinary air, being similar but, naturally, more pronounced. He says "this fire-air is just that air by means of which fire burns in common air; only it is there mixed with a kind of air which seems to possess no attraction at all for the inflammable substance, and this it is which places some hindrance in the way of the otherwise rapid and violent inflammation. And, in fact, if air consisted of nothing but fire-air, water would surely render small service in extinguishing outbreaks of fire."

Physiological experiments were also performed with rats, flies, bees, caterpillars, butterflies, peas, etc. In the case of animals it was observed that air was partially converted during the respiration of animals into aerial acid. An experiment with a

bee was performed in the apparatus represented in Fig. 3, E. Into the bottle A, which had a small hole at the bottom, was put a piece of unslaked lime, and the mouth was then closed with a cork through which passed a tube B. The inverted glass C contained a live bee and some honey to serve it as food, and the connection with the bottle was made air tight by means of a ring of pitch. The bottle A was then stood in a vessel of water D, and weighted to prevent it floating. A little water rose into the bottle through the small opening every day, and after seven days the water had risen to the line E and the bee was dead. The aerial acid formed was, of course, absorbed by the lime water, and it was noted that when two bees were enclosed the same quantity of air was converted into aerial acid in half the time. The other insects caused a similar effect, as did also fermenting peas, and Scheele was able to prove that the fire-air only was thus converted into aerial acid.

Plants were found to be unable to grow in pure fire-air, though animals existed longer in pure fire-air than in ordinary air. Scheele also assumed that there was a difference between animals and insects in this respect, being puzzled, apparently, by the part played by vitiated air (nitrogen) in the respiratory process. He observes, "it is the fire-air by means of which the circulation of the blood and of the juices in animals and plants is so fully maintained. Still, it is a peculiar circumstance that blood and the lungs have not such action upon fire-air as insects and plants have, for the latter convert it into aerial acid, and the former into vitiated air." Fire-air being found by Scheele to be soluble in water, he suggests that it must be as indispensable for aquatic animals as for those which live upon land. "They must draw it into their bodies, and convert it either into aerial acid or into vitiated air."

COMMENTS ON SCHEELLE'S WORK.

It is clear that Scheele besides discovering oxygen independently and, as it now appears, first in point of time, obtained very similar results to those of Priestley, though he proceeded about the work in a much more systematic and exact manner. He did not discover so many new chemical substances as Priestley, but opened up much new ground. An equally strong supporter of the phlogiston theory with his English co-discoverer, he was also led to erroneous conclusions by his own exact observations. On finding that when air appeared to combine with the phlogiston in phosphorus, metals, and other bodies (i.e., lost oxygen), the residue became lighter than common air, he inferred, as has been shown, that a portion of the common air must have disappeared, and that, accordingly, the air must consist of two gases. One of these he assumed to be capable of combining with phlogiston, and he concluded that it must be heat or fire which escaped through the glass. It does not appear that he ever realised that ordinary air consists of the two distinct gases, oxygen and nitrogen. Like Priestley he seems to have regarded the latter as an impure variety of his fire-air, rendered so by the addition of phlogiston.

It is pointed out by Thorpe that the delay in the publication of Scheele's work on air and fire tended to prevent a proper recognition of his merit among his contemporaries. His extraor-

dinary insight is described as instinctively seizing on what is essential, and "no man was ever more staunchly loyal to the facts of his experiments, however strongly these might tell against an antecedent or congenial hypothesis." His work was more qualitative than quantitative, or he would probably have overturned the phlogiston theory earlier than that was done by Lavoisier. As in Priestley's case, however, others made use of his facts to demolish that theory by which he could alone explain them, and to which he vainly imagined they lent so strong a support, and "it must be admitted that he was wanting in the faculty of co-ordination, grasp of principle, and power of generalisation, that so strikingly characterised Lavoisier."

Scheele was yet the greatest chemical discoverer of his age. "An obscure apothecary, living a solitary sedentary life in a small town on the shore of a Scandinavian lake, hampered by poverty and harassed by debt, hypochondriacal, and, at times, the victim of the most depressing melancholy—he yet succeeded by the sheer force of his genius as an experimentalist, and under the influence of a passion which defied difficulty and triumphed over despair, in changing the entire aspect of a science. No man ever served chemistry more loyally or with a purer, nobler, more disinterested devotion than Scheele."*

(To be continued.)

THE MANUFACTURE OF MILK SUGAR.

BY CHARLES A. SERRE, B.SC.

In these days of lactated food and tablet triturates the use of milk sugar is increasing by leaps and bounds; at a rough estimate the United States consume annually one and a-half million pounds.

Ten years ago practically all the United States supply came from Switzerland and Germany. To-day our best manufacturers actually export.

The technical information that we are enabled to gather from books is exceedingly scant, for the simple reason that this product has been in the hands of the "black art brigade." Perhaps this is as well, since the results until late years have been of such quality as to make print unnecessary.

As primary product, whey is used. This is obtained from the cheese districts of Northern New York State, Ohio, and Illinois. As a general rule the manufacturer allows the farmer five cents per hundred pounds of whey as it comes from the cheese factory or creamery, if in good condition (not soured). This price is not exorbitant, but, as the manufacturer is in the hands of the farmer, sour or sweet he has to take the whey. Now it so happens that, cent per cent, whatever the acidity may be, it represents a corresponding loss to the maker, plus a deal of extra labour.

The first part of the process consists in making "raw sugar," and must be conducted next to the cheese factories, as every minute's delay promotes souring. The whey is pumped or run into steam-jacketed iron tanks holding about 600 gallons each and technically called "defecators."

Steam is turned on and the heat kept at 190° F.,

when most of the uncourded milk, fat and casein are thrown out. The whole is allowed to stand, and the clear liquor, after being drained into a lower defecator, is treated with lime or chalk, boiled, skimmed, and concentrated either in open air or vacuum pans.

The solids, skimmed and drawn off, are dried and ground, making valuable ingredients for poultry-food or an adjunct to dog-biscuits.

Nature has so contrived that where milk is cheap, coal is dear; and, as the latter is the more expensive item, the manufacturer has to ship the concentrated whey or crude sugar to considerable distances.

In practice it is usual to effect concentration to one-fifth the original bulk of whey, or 15° B., as it is less liable to decomposition or crystallisation at this strength. Yet a source of waste is frequently present here, as of necessity this syrup has to be shipped in barrels. Nature and railroad employes then join forces in their attempts to reduce profits, as what the sun does not burst the latter succeed in staving in. I have seen nine empty barrels out of a shipment of fifteen.

Arrived at the refinery the barrels are rolled to the dumping-tank on ground floor, emptied, steamed, and sent to the cooper's shop. The syrup is boiled, and pumped or forced to the top floor, boiled in defecators, lime added, skimmed, bleached through charcoal, filtered, run into vacuum pans, concentrated to 30° B., and finally run into crystallising pots and allowed to cool.

On the following day the crystals are poured into centrifugal machines, drained, washed, and placed in the drying-room at a temperature not above 120° F. In case "CC" sugar is required, the fairly concentrated liquor is run into wooden vats furnished with strings or wooden strips four to six inches apart, and allowed to crystallise slowly.

Of necessity I have had to give the refining process hurriedly in order to present a general idea.

In practice things do not go so smoothly, as the troubles begin from the moment the syrup arrives at the refinery.

Previous to detailing these, I shall make myself better understood by saying that pure milk sugar must be absolutely white, make a clear and bright solution when boiled, stand sulphuric and chlorine tests, leave no ash on incineration, and, above all, be free from smell.

Considering that raw syrup is never twice the same chemically, and that its physical properties range from yellow to muddy black, there is a fund of trouble in store for the operator.

In the first place, the amount of lime necessary for defecation has to be determined, as lime and litmus are dangerous agents in the hands of the man in charge of the defecators. The colouring matter is likewise noted and only the necessary quantity of charcoal used, as too much means loss of sugar and too little ensures a coloured product. Most difficult of all is to get the solution bright. If not bright, no matter how slight the cloudiness, the albuminous matter in suspension will decompose, and the sugar will possess a characteristic offensive odour.

* Thorpe, 'Essays in Historical Chemistry.' (Macmillan.)

The vacuum pans have to be watched carefully, the syrup getting "wild" at times, when loss is incurred. The centrifugal operations must be watched closely; sufficient distilled water must be used to wash out all mother liquor, but not enough to reduce the yield materially. The sugar should not contain more than 5 per cent. of moisture on leaving this machine.

Grinding is best effected in large pebble mills provided with exhaust air and chamber for impalpable powder.

Revivification of charcoal is conducted in much the same style as in ordinary sugar refineries. The mother liquors are calculated and reworked.

A 5 per cent. whey at the cheese factory yields 3½ per cent. at the refinery. The majority of makers do not exceed 2½ per cent., and their product is inferior to that of those who work on a scientific basis.

To inform the majority of manufacturers that they need a chemist and a laboratory would be waste of time, and as a result of this lack of competent oversight these houses are gradually going under.

Milk sugar is as much in need of intelligent and practical treatment as any other sugar; the first to recognise this were the American Lactose Co. and the National Milk Sugar Co. As a result, European products do not equal our best brands in look or quality.

—*Bulletin of Pharmacy.*

SPECIALISM IN PHARMACY, BEGOTTEN BY PROGRESS IN BACTERIOLOGY.

Despite its very speculative character, much interest attaches to the forecast made by Dr. Josef Schrank in his address on the future of pharmacy, delivered at the last gathering of German scientists and physicians in Vienna. Bacteriological remedies for disease give to-day such a promise as they have never given before; their general adoption cannot fail to exert an influence on pharmacy; and the present world-wide discussion of the antitoxin treatment of diphtheria bids the pharmacist reflect on the manner in which his interests are to be affected. Mere conjecture, under the circumstances, is better than a heedless apathy.

Pharmacy and bacteriology first came in touch when the aseptic treatment of wounds began to prevail. Shortly thereafter, Medicine demanded that the liquids for subcutaneous and intravenous injection be administered sterile. Now it is probable that pharmacy will be greatly modified by the future use of agents imparting immunity, and pharmacists will be required to supply immunised blood-serum and alexines, tannin solutions, chemicals, and culture media.

Where the physician lacks time for the bacteriological examination of blood, pus, sputum, urine, and the like, the pharmacist will find lucrative and honourable employment.

Dr. Schrank asserts that the medical curriculum of the future must be made to comprise hygiene, food-investigations, bacteriology, and that portion of veterinary medicine needed in the production and testing of bacteriological remedies. *Pari passu*, the office of the apothecary must expand till it comprehend the manufacture of bacteriological remedies, the testing of foods, and the general labour required as a preliminary to

diagnosis. The next step must be the establishment of distinct classes of apothecaries—pharmaceutical specialists—according to their individual functions. We shall then have the Dispensing Specialist, the Food and Water Specialist, the Urinologist, the Pharmaceutico-Bacteriological Specialist, etc., etc.

It is incontestable that pharmacy will be affected by the advances in bacteriology: those advances have already made themselves felt in almost every drug store, and should the much-discussed antitoxins fulfil their promise the druggist will become their natural and proper purveyor. Beyond this point, however, the Dr. Schrank's forecast is purely speculative; the production of the new remedies will at once be undertaken by the large manufacturing laboratories, or by the government, never by the pharmacist. Fancy the retailer of the future dividing his time between the dispensing-room and the bacteriological wing, preparing his own cultures, making his own injections into the animals purchased at great expense, observing the physiological reactions, tapping the blood from the animal, and finally decanting the curative serum into his own phials! The pharmacist in the past has never tried to make his own vaccin, nor will he be more likely to manufacture antitoxin in the future.

There is no reason why the educated druggist should not become the expert food- and water-analyst or bacteriologist, thus creditably enlarging the scope and income of his labour. But the first essential is a thorough and suitable education. At the present time it is useless in the United States to urge such work on any save a small body of accomplished apothecaries. Sanitary and urinary analyses, bacteriological determinations, require an amount of learning which we have no right to expect from any man save the avowed specialist. We do not want to see the courses in pharmacy so arranged as to give the student a smattering of many things—we want first to see solid instruction in the indispensable few:—pharmaceutical chemistry, botany, microscopy, materia medica, pharmacognosy, and practical manipulations. When this foundation has been solidly built, the desired superstructure may be added. Any other course will accomplish precisely the mischief which is now so obvious in medicine—specialism run mad—specialists galore—leaping from the college into the specialty and assuming the airs of the expert ere possessing the experience of the general practitioner. Specialism should be the natural, unforced outgrowth of general practice, whether in medicine or pharmacy. From any other may the Lord deliver us!—*Bulletin of Pharmacy.*

MEDICINE STAMPS DUTY.

The duty paid for medicine stamps during the past four years was as follows:—

Year ending March 31.	Medicine Stamp Duty.	Amount of Increase.	Amount of Decrease.
1891	£225,701	..	..
1892	£240,062	£14,361	..
1893	£220,325	..	£19,737
1894	£213,210	..	£ 7,115

NOTES ON RECENT SCIENTIFIC INVESTIGATION.

DETERMINATION OF THE PURITY OF LIQUIDS.—Having been engaged in purifying a number of pharmaceutical products, R. Pictet has sought for some definite means of ascertaining their purity, and finds that in the case of liquids, the direct observation of the temperature of their critical points affords a very sensitive test (*Comp. rend.*, cxx., 43). This temperature varies from ten to sixty times more than that of the boiling point in the case of a given liquid under similar conditions. The method adopted was to take a series of very pure liquids and determine their boiling points, noting the height of the barometer, and then to determine the critical points by means of a sensitive thermometer. A few drops of alcohol, aldehyde, water, etc., were then added to the pure liquids, and the boiling and critical points again observed. A tube of 5 Mm. external diameter, 3 Mm. internal diameter, and 45 to 50 Mm. long was filled with the liquid under examination. A portion of the contents was then evaporated, and the tube sealed by means of the blowpipe, so that it was one-third full of liquid, and the remaining space occupied by saturated vapours. The tube was next placed obliquely in a small rack, side by side with a very sensitive thermometer, in the centre of a thin sheet-iron cylinder having two openings fitted with mica. A similar, larger, cylinder surrounded this, and was warmed from below by a multiple gas flame, the current of heated air passing through a series of wire gauze partitions which divided the enveloping space. The whole apparatus was finally enclosed in a third sheet-iron cylinder, covered with asbestos, and arranged so that the tubes could be readily observed through the three pairs of windows. The stem of the thermometer passed through openings in the three cylinders, and it was possible to note distinctly the tenth of a degree. Chloroform, chloroethyl, and pental were the liquids examined. The temperature was first allowed to rise slowly to the critical point, when the meniscus suddenly disappeared, and very characteristic gyratory movements were visible throughout the length of the tube. The temperature was then gradually lowered until the transparent interior of the tube became suddenly opaque, the minute particles of liquid collecting at the bottom and the meniscus reappearing. On warming again, and after several trials, a temperature was found at which within one-tenth of a degree the meniscus was observed to disappear and the mist become visible. This mean temperature is that given as the critical point in the following table:—

	Critical point.	Difference.	Difference in b. p.
Chloroform, pure	258°·8	-3°·8	-0°·1 to 0°·2
Chloroform mixed with a few drops of alcohol.	255°·0		
Chloroethyl, pure.....	181°·0	+6°·0	+0°·6
Chloroethyl mixed with a few drops of alcohol...	187°·0		
Pental, pure	201°·2	-1°·7	<0°·1
Pental mixed with a few drops of aldehyde.....	199°·5		

In taking the boiling point it was found necessary always to immerse the thermometer to a uniform

depth at the same place, the same vessel being employed and heated by a flame of uniform power. The addition to a liquid of others more volatile and readily soluble lowered the temperature, as when aldehyde was added to pental. On the other hand, the addition to chloroform, boiling at 61°, of the less volatile alcohol, equally lowered the temperature of the critical point. Chloroethyl, which boils at +11°, had its critical point raised 6° by the addition of alcohol, which boils at 78°·8. It is difficult, therefore, to deduce a general law.

ANTIMONIC ACID.—Sorono has shown that the supposed pyro-antimonoxhydrate does not exist. When antimony trisulphide and aqueous potash are boiled together, and the clear liquid is then boiled with a concentrated aqueous solution of copper sulphate, a white precipitate is thrown down on the addition of acetic acid, which was thought to be pyro-antimonoxhydrate, $\text{Sb}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$. This precipitate on examination proved to be ortho-antimonic acid, $\text{Sb}(\text{OH})_3$. The reaction depends on the formation of copper oxide and potassium sulphantimonite and subsequent oxidation of the sulphantimonite with formation of potassium antimonite, which on the addition of acetic acid, yields ortho-antimonic acid which is precipitated (*Journal für prak. Chem.*, LI., 97).

GRAPHITE FROM IRON.—Having studied the graphites obtained in a variety of ways, and shown that a number of metals can displace carbon in this form from iron, H. Moissan has compared the different varieties of graphite liberated from the latter metal under different conditions of temperature and pressure. He finds that, at the ordinary pressure, the graphite formed is purer, as the temperature becomes more elevated, besides being more stable in the presence of nitric acid and potassium chlorate. The effect of the pressure on the crystals and masses of graphite is to give the latter the appearance of a fused mass. The small quantity of hydrogen always present in graphite diminishes in proportion as the purity of the graphite increases (*Comp. rend.*, cxix., 1245).

DIASTATIC FERMENT IN PLANTS.—From experiments on seedlings of *Canna*, *Platanus*, *Phaseolus*, *Begonia*, etc., Dr. J. Grüss concludes the existence in seedlings of a soluble diastase which is capable of diffusion through the cell-wall in the same way as sugar. It appears to pass, with maltose, out of the cotyledons into the stem; for the removal of the cotyledons diminishes the amount of diastase in the stem. The quantity of diastase present was ascertained by its action on starch, the iodine test being used to determine the extent to which the starch had been destroyed. The penetration of the diastase into the substance acted on is accompanied by a simultaneous change in the latter, and to this process the author applies the term "allenolysis." The action of the diastase on the reserve cellulose in the seed of the date is very slow, and ends in its transformation into soluble products, probably mannose. It is by this action of diastase that the absorption of reserve cellulose takes place in the germinating date (*Pringsheims' Jahrbuch für wissensch. Bot.*, 1894, pp. 379-437, and *Sitzber. Vers. deutsch. Naturf. u. Aerzte.* 1894).

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JANUARY 26, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, — 17, Bloomsbury Square, London, W.C.

THE PRESIDENT IN MANCHESTER.

A MEETING of the members of the Manchester Pharmaceutical Association was held in Manchester on Wednesday afternoon, for the purpose of hearing an address by Mr. MICHAEL CARTEIGHE (President of the Pharmaceutical Society of Great Britain). Mr. GEO. S. WOOLLEY presided.

The subject of Mr. CARTEIGHE'S address was "The Possibilities of Future Legislation in the Interests of Pharmacy." He denounced as an absolute scandal the use that could be made of the limited liability Acts for the formation of public companies, and argued that it was no use asking the Pharmaceutical Council to tackle the question and fight it with the House of Commons, unless the Bill they presented was perfectly logical. They would have a much better chance of success if they could tell the Legislature that not only was company trading dangerous, but also the carrying on of a business of a deceased chemist by executors, even though a registered assistant was employed. If a chemist could by will devolve his personal rights as a registered person to his widow, who was unqualified, there was no reason why a grocer should not employ a qualified assistant to manage the pharmacy department of his shop.

Between the company and the executors there was, however, one difference. If the latter did not keep a qualified assistant they could be sued for penalties. The company, though they had no registered assistant, could not be sued. All the Council of the Pharmaceutical Society could do in that case was to keep a watchful eye on any unregistered assistant of a company who actually sold poisons.

The Council ought also to have power, he firmly believed, to erase from the Register any chemist who was proved guilty of misdemeanour, in the same way that medical men and lawyers who were found guilty of improper and unprofessional conduct were erased.

On the subject of training young men for the calling of chemists he contended that it was of the utmost importance that they should have a thorough education. The policy of encouraging errand lads to cram themselves with sufficient knowledge to enable them to scramble through the examinations was to be deprecated. Such a practice was not only bad for those who were already in the trade, but was a delusion to the persons most directly concerned. After expressing regret that a larger number of the students did not subject themselves to the Major examination, but were content with the privileges they gained by passing the Minor, Mr. CARTEIGHE stated that they must be prepared to abide by the condition of things which prevailed in the trade, and to ask those who had not passed the Pharmaceutical examinations to come in and join them to a greater extent in the management of the affairs of the general body.

To accomplish that end they were quite prepared to go to Parliament with what they hoped would be a non-contentious Bill. He was afraid, however, that nothing could be secured from the Legislature unless the Society could say that it had at its back a majority of the chemists of the country. They must also begin, as other bodies had already begun, to consider the interests of their craft in connection with the great political interests of the country. They must approach parliamentary candidates on matters affecting their trade and show that they had some claim to consideration. They were powerful for defence in the House of Commons, but not powerful enough for legislative purposes.

On the motion of the Chairman, seconded by Mr. TAYLOR (Bolton), the meeting resolved, with two dissentients, that the Society deserved the support of the trade in its efforts to carry on the existing laws and to promote further legislation. It was also resolved on the motion of Mr. KIRKBY, seconded by Mr. J. RYMER YOUNG, that the consolidation of the Pharmaceutical Society would be greatly furthered by the removal of the limit as to the number of chemist and druggist members upon the Council.

THE REGISTER, 1895.

IN accordance with section 13 of the Pharmacy Act, 1868, the REGISTRAR has "caused to be printed and published" the 'Registers of Pharmaceutical Chemists and Chemists and Druggists' for 1895. Few persons engaged in pharmacy take any interest in the

publication of this official book, and it is liable to escape general attention that the Register is legal evidence that the persons specified in its pages are registered conformably to the Pharmacy Act, and are therefore entitled to practise in Great Britain.

That this fact is often overlooked is evidenced by the REGISTRAR's announcement that during 1894 he erased the names of 246 persons whose whereabouts was unknown to him. It is to be feared that the condition of mind which leads so large a number of persons to be so indifferent to their legal status, has been fostered to some extent by the gratuitous system of pharmaceutical registration. The Pharmaceutical Society exacts no fee for placing a person's name on the Register, nor is any registered person mulcted in a single farthing in respect of the heavy expense of keeping, printing, and publishing the Registers year after year. A not unnatural consequence is that registered persons are apt to lightly value their registration and to forget its signification.

We may be allowed, too, to say something of the labour entailed in keeping the Register. Enquiry of the REGISTRAR elicits that during the past year over 3000 alterations have been made in the official Register, and that a large portion of the work was necessitated by changes of address. Over 500 new names were added, and almost as many were erased on account of death or under section 10 of the Pharmacy Act. The latter operation necessitated a preliminary issue of nearly 700 registered letters in March, and 500 in September, besides the publication of several hundred names in this Journal (see *Pharm. Journ.*, November 17, 1894). Moreover, in order to realize as far as possible the words of the Act, and to produce a "correct Register," every local and divisional secretary of the Society in the Kingdom was furnished with a copy, and was invited to point out to the REGISTRAR any inaccuracies he might discover. If, therefore, the present edition is not absolutely accurate it cannot be attributed to any neglect on the part of the official charged with its preparation and revision.

PROPRIETARY FOODS.

We have had frequent occasion to point out the demoralising effects of the abuse of proprietary medicines, and now have to notice a recent grave indictment of proprietary foods. Dr. Barlow, in the last "Bradshaw" Lecture delivered before the Royal College of Physicians, spoke of infantile scurvy in its relation to rickets, a subject that had previously been brought into prominence by Dr. Cheadle, whose work on the artificial feeding of infants is so well known. We are not in a position to discuss the causes and effects of rickets, but it is common knowledge that the crowds of children who fill the out-patient rooms of the hospitals of large

towns are in a great proportion of cases suffering from rickets or deformities of the limbs or of the chest caused by this disease. But disease induced by improper or insufficient food is by no means confined to the poorer classes. Indeed, Dr. Barlow lays stress on the fact that the combination of scurvy with rickets is of more common occurrence among the children of the well-to-do than among those of the poorer classes. This is attributed to the fact that social duties may so tax the energy and time of some mothers that the natural food, and the only perfect food for infants—mother's milk—is not available.

When from any reason the natural food is not to be had, the usual substitute is cow's milk diluted with thin barley water. This is a dangerous food, unless the utmost care is taken to boil the milk, which must be obtained quite fresh at least twice a day, and to sterilise all vessels by boiling water each time they are used. Diluted cow's milk is less digestible than human milk, and does not contain the nutrient ingredients (proteid, fat, carbohydrates, and salts) in the proper proportion. By the addition of raw meat-juice, cream, and sugar, it may be brought up to the right nutritive power, but to judge what modifications are necessary in any case requires the greatest care on the part of the experienced medical man, and we are only concerned with the principles of feeding in order that those who purchase artificial foods without having obtained medical advice—and in the poorer districts this is commonly the case—may be cautioned. By the help of Dr. Cheadle's work we will pass in review some of the chief forms of proprietary foods, and may state at once that any of those which pretends to be a complete food, and to require merely the addition of water, is to be condemned as misleading, for, though it may contain the necessary elements, they are so altered by the mode of preparation that they are likely to cause disease.

In the first place the commonest kind of preparation, namely, the farinaceous foods, may be noticed. These are only to be used as additions to diluted milk. Some, that consist chiefly of starch—like the domestic arrowroot—may be condemned as indigestible and almost useless. Foods prepared from fine wheaten flour heated to a high temperature, though more digestible, are of but little use, as they are greatly deficient in proteids. Chapman's whole-meal flour contains much proteid, but requires prolonged boiling to break up the starch, and cannot be used for very young infants, probably on account of the irritating, though finely divided, particles of the husk. Malted foods are prepared by mixing malt meal with wheat meal, and warming until part of, or all the starch is converted by the diastase into dextrine, or grape sugar. Such foods make a useful addition to diluted milk, but they should never be used alone. Dr. Cheadle has

pointed out that the whole-meal food, when malted, can be used as an adjunct to diluted milk even for young infants. Malted foods with dried animal proteid added are insufficient without the addition of fresh milk.

The second group of foods to be mentioned are the various forms of condensed milk. Many children are said to have done well on this alone, but, still following Dr. Cheadle, their deficiency in cream and their altered molecular constitution render them liable to cause rickets or even scurvy. The great excess of cane sugar in such preparations is a further obstacle, and the unsweetened forms are likely to be soured, and so are highly dangerous. But for a temporary diet, and especially on voyages, these preparations are of the utmost service. Another group consists of the meat preparations. Most of them—like beef-tea—are not foods but stimulants, and if used as an exclusive diet would lead to starvation. Meat peptones are highly nutritious, but are only required in cases of sickness, and so are to be given at the order of a medical man. Reference has already been made to raw meat-juice. It can only be a domestic preparation, as it must be absolutely fresh, and no artificial preparation can replace it. Lastly, mention must be made of pancreatised and other pre-digested foods. What has been said above of meat peptones applies to them. If given for a long period they cause impairment of the functions of the digestive organs, and their employment should be regulated by medical advice. Thus it appears that not a single artificial or proprietary food is sufficient in itself. Many are useful as adjuncts to diluted milk, or in times of sickness.

THE LIQUEFACTION OF GASES.

In *Nature* for January 10, a claim for priority with respect to the liquefaction of gases is advanced by C. OLSZEWSKI, of the University of Cracow, who states that he has been engaged since 1883—at first in conjunction with the late Professor WRÓBLEWSKI, then alone and, later, associated with Professor WITKOWSKI—in the examination of the so-called permanent gases at very low temperatures, and that all except hydrogen were liquefied in quantity for the first time by him. In addition to this, he apparently claims to have been the first to determine the critical and boiling points of these bodies, and to solidify and determine the freezing points of nitrogen, carbon monoxide, nitric oxide, and methane. Further, he charges Professor DEWAR with repeating his experiments and copying his apparatus without due acknowledgment, thus gaining reputation at his expense, and with having been credited by the British public with priority in the liquefaction of oxygen and other gases. Professor DEWAR, in reply, points out what should seem sufficiently obvious to everyone acquainted with the subject, namely that, considering the DAVY Medal was awarded by the Royal Society in 1878, to CAULLETT and PRIEST for their achievements of the liquefaction of the gases in question, it is hardly likely he could put forward in England any claim for such a result. The assertion that the apparatus used at the Royal Institution was copied, is refuted also, as well as the statement that proper acknowledgment had not been made of the labours of foreign workers.

LONDON UNIVERSITY.

ON Tuesday last Lord ROSEBERRY received two deputations on the subject of a teaching university for London. The first, introduced by Professor HUXLEY, supported the recommendations of the Gresham Commission; but that introduced by Mr. FLETCHER MOUTON protested against the proposed change, which, it was alleged, would contract the scope and lower the standard of the competition for degrees and honours. Lord ROSEBERRY acknowledged the strength of the arguments on both sides, but inclined to the views of Mr. HUXLEY, and later in the day the Convocation of London University practically confirmed his choice by adopting the report of the Gresham Commission and rejected hostile amendments. The *Daily News* points out that a Statutory Commission will have to be appointed by Parliament before the union can be carried out, and as a single member of Parliament might make it very difficult to pass the Bill, the matter is by no means settled yet. The University of London has hitherto confined itself to examining candidates and giving them academic certificates of their capacity. It has not taught anyone, and has never asked, where candidates came from. Professor SILVANUS THOMPSON made an unfortunate reference to "cobblers," likely to damage the cause in which he was speaking. The University has justly boasted that it regarded only knowledge, and was no respecter of persons. But the drift of public opinion is in favour of combining instruction with examination.

THE TRUSTS OF THE ROYAL SOCIETY.

ONE of the immediate results of the recent discussion in the *Times*, concerning the premium understood to be paid to the recipient of the RUMFORD medal, has been the reading of a paper on "The Trusts of the Royal Society," by Sir JOHN EVANS, at the meeting of the Society on January 17. A brief report of the paper, which was virtually a catalogue of the various trust funds vested in the Royal Society—seventeen in number—appeared in the *Daily News*. The seventeen funds have vastly different incomes and objects. Of these the richest is the Scientific Relief Fund, which has at present an income of about £870, and is devoted to the aid of such scientific men or their families as may from time to time require it. The RUMFORD Fund, amounting to £2,330, provides that the interest of this money is to be given once every two years as a premium to the author of the most important discovery or useful improvement which shall be made or published by printing or in any way made known to the public in any part of Europe during the preceding two years, on heat or on light. The list is too long to set forth at length, but the oldest and newest funds may be mentioned. The oldest is the CROONIAN Lecture Fund, which dates from as far back at 1660, and provides for the support of a lecture and illustrated experiment for the advancement of natural knowledge on local motion, or such subject as may be deemed useful by the President for the time being; the newest is the BUCHANAN Medal Fund, which provides for a medal to be awarded every five or seven years for distinguished service in hygienic science or practice in the direction either of research or of professional, administrative, or constructive work.

Proceedings of Societies in London.

CHEMICAL SOCIETY.

A meeting was held on Thursday, January 17, 1895, the President, Dr. Armstrong, F.R.S., in the chair. The following papers were read:—

OCTACETYL MALTOSE.

BY A. R. LING AND J. L. BAKER.

The physical constants of this substance obtained in a crystalline condition were re-determined and found to differ slightly from those previously recorded by Herzfeld,* particularly with regard to the rotatory power and crystalline form. The figures obtained by the different observers were

$$[\alpha]_D \begin{cases} = + 81^{\circ} \cdot 8 & (\text{Herzfeld}) \\ = + 61^{\circ} \cdot 22 & (\text{Ling and Baker}) \end{cases}$$

Since this compound is used in the identification of maltose, this correction is important.

THE ACTION OF DIASTASE ON STARCH.

BY A. R. LING AND J. L. BAKER.

The authors have examined the hydrolytic products of starch when acted on by diastase. The diastase was obtained from different sources, and prepared by different methods. The authors confirmed the previous results recorded by Brown† and Morris, since they obtained maltodextrin, the physical constants of which were determined and found to agree with those given by Brown and Morris. "Isomaltose," another product of the hydrolysis of starch, was also isolated, and the osazone on examination possessed the same melting point as that recorded by Lintner.‡ The isomaltose was purified by crystallisation and precipitation from methylic alcohol solution by absolute alcohol. The isomaltose thus obtained agreed in these respects with that obtained by Lintner, but on treatment with sodium acetate and acetic oxide a mixture was obtained from which octacetyl-maltose was separated and identified. The isomaltosazone was also proved to be a mixture, since maltosazone was separated and identified. Further experiments on the action of diastase and determination of its reducing power showed that isomaltose is not a homogeneous substance, but a mixture of maltose with probably two other substances. One of these was separated, and from examination of the osazone is probably a new sugar— $C_{12}H_{22}O_{11}$ —for which the name amylotryose is proposed. The other substance present in isomaltose appeared to be a dextrin which, however, was not identified.

Mr. H. Brown, F.R.S., stated that experiments in progress in his laboratory confirmed the conclusions recorded above as to the non-homogeneity of isomaltose so far as that it was not a pure substance nor an isomer of maltose.

Dr. Kipping suggested that a better name for the new sugar would be triamylhexose.

* Ann. 220, 215.

† Trans. Chem. Soc., 1885, p. 561, cf. Herzfeld, B. XII., 1210.

‡ Zeit. Brauwesen, XV., 145.

NOTE ON DERIVATIVES OF CAMPHOR.

BY M. O. FORSTER.

Of the two dibromocamphors previously described melting at 61° and 114° respectively, only the β - or higher melting substance yield a nitro-derivative. Both, however, on reduction, yield first monobromcamphor and then camphor. When α -dibromcamphor is treated with fuming nitric acid, heat is evolved and an oil is obtained which, when steam distilled, yields crystals which may be easily purified by crystallisation from alcohol. This substance has the formula $C_{10}H_{12}Br_2O_2$, is an inert substance, not reacting with phenylhydrazine or hydroxylamine, and yields on reduction with zinc dust a substance of the formula $C_{10}H_{12}BrO_2$. This latter substance is phenolic in character and reacts neither with phenylhydrazine, hydroxylamine or acetyl chloride, but with bromine yields α -dibromcamphor. When acted on by a mixture of nitric and acetic acids, carbonic oxide is split off and a substance formed of the formula $C_9H_{11}BrO \cdot NO_2$. The reduction products of this compound are being examined.

THE ACID SULPHATE OF HYDROXYLAMINE.

BY DR. DIVERS.

Several hydrochlorides of hydroxylamine are known but hitherto the acid sulphate has not been prepared. When an aqueous solution of the acid sulphate is treated with alcohol, crystals of the normal sulphate are obtained. The acid sulphate may be prepared as follows:—the equivalent quantity of sulphuric acid is added to solid hydroxylamine hydrochloride, and the mixture then placed in a large dish and heated on a water bath, when the hydrogen chloride is driven off. The mass is then allowed to cool in a dry atmosphere, when long crystals separate, which are, however, very deliquescent. The identity of the substance was proved by titration of the acid by normal alkali, methyl orange being used as an indicator.

THE HYPOPHOSPHITES OF MERCURY AND BISMUTH.

BY S. HADA.

These hypophosphites have not previously been prepared. When solutions of mercuric nitrate and sodium hypophosphite are mixed, mercurous hypophosphite is formed and separated as a double salt, which is perfectly stable and crystalline, and has the formula $Hg_2H_2PO_2 \cdot HgNO_3 \cdot H_2O$. On heating at 100° it explodes, and with hydrogen chloride yields calomel and then mercury. Bismuth hypophosphite is precipitated on mixing solutions of bismuth nitrate (free from acid) and calcium hypophosphite. The precipitate is a white crystalline powder which must be at once separated by filtration from the mother liquor, otherwise decomposition takes place. The salt is decomposed by water yielding phosphine, PH_3 , and other products, and on heating the salt decomposes according to the following equation:—

$3 Bi (H_2PO_2)_3 = 2 Bi + Bi (PO_3)_3 + 6P + 9H_2O$,
and yields metallic bismuth, phosphorus, bismuth phosphite and water.

ROYAL INSTITUTION.

The lecture theatre of the Royal Institution was filled to its utmost capacity on the 18th inst., when Professor Dewar, LL.D., F.R.S., discoursed on "Phosphorescence and Photographic Action at the Temperature of Boiling Liquid Air," before an audience which included the Marquis of Lorne, Lord Playfair, Lord Rayleigh, Sir Frederick Abel, Professor Crookes, and many other eminent scientists. The lecture was, to a great extent, a popular version of that given before the Chemical Society on June 28, 1894 (see *Pharm. Journ.*, July 7, 1894).

At the outset a few experiments were performed to illustrate the modification of the molecular elastic properties of bodies caused by exposure to the temperature of boiling liquid air. By this it was demonstrated that not only the breaking, but also the torsional, strain was increased to a great extent. Thus a metal spiral which at the normal temperature was incapable of supporting a certain weight, after being immersed in liquid air, and thus exposed to a temperature of -190°C ., readily sustained it, but gradually returned to its former molecular condition after exposure to the atmosphere temperature. The effect of immersing various substances in liquid oxygen was next shown, in some cases chemical action taking place, but often the reverse. When ignited sulphur was used the reaction was very striking. At first it continued to burn, but its combustible tendency was gradually overcome, leaving a residue of solid sulphurous acid. After briefly alluding to the work of other scientists on phosphorescence—especially to the researches of the Becquerels, father and son, from about the year 1840—Professor Dewar performed several experiments illustrative of the effects of heat and cold upon phosphorescence. It was thus generally shown that phosphorescence induced in stimulated bodies at -180°C . was greatly excited by subsequent rise of temperature; on the other hand, a body which was normally phosphorescent, on being cooled to -80° , had its phosphorescence temporarily discharged, but it was restored on heating. With regard to the parts of the spectrum which are most active in stimulating bodies, and hence in inducing phosphorescence, the ultra-violet rays are found to be those which produce the effects, the phenomenon consisting of the absorption of the ultra-violet rays and emission of those light rays which come within the range of our vision; and it was also shown that the luminous and heat rays are able to dissipate the luminosity of a phosphorescent body in those parts upon which they have fallen. The terms fluorescence and phosphorescence were then compared, the distinction made being one of degree rather than of kind, inasmuch as "phosphorescence is a species of fluorescence, which lasts for a much longer time after the excitation has ceased."

Attention having been drawn to the construction and use of the phosphorescope, an instrument which measures the period during which a stimulated body exhibits phosphorescence, the effects of cooling to -190° , upon a variety of substances which at the normal temperature were very faintly, or more often

not at all, phosphorescent were then shown. In each case the body glowed brightly, after being cooled by plunging into boiling liquid air, and then stimulated. Amongst the substances shown were cotton-wool, horn, leather, celluloid, feathers, silk, a flower and an egg-shell; and the experiments were variously modified in order to show that phosphorescence was only exhibited at the part where the cooling had taken place, and that stimulation by exposure to an electric beam of light was in all cases essential. The fact that oxygen when cooled is phosphorescent was also demonstrated. Considerable skill was necessary in the manipulation, as, not only in many cases was the phenomenon only visible for a few seconds, but also the intense cold in many cases made the substance so brittle that its removal from the jar of liquid air was almost impossible. Passing on to the examination of organic compounds of definite chemical composition, the three types shown were acetic acid, quinine sulphate, and acetamide. Here the action of the glass containing the substances, in stopping to a certain extent the stimulating rays was strikingly shown, the result being phosphorescence which was brilliant in the extreme. The ketones as a group were referred to as a class of organic compounds which exhibit the phenomenon remarkably well. Lastly, the platino-cyanides of lithium and ammonium were shown, giving a brilliant light. Speaking generally it appears that in substances of definite chemical composition which are volatile and can be distilled and crystallised we have conditions which are favourable for phosphorescence.

When dealing with photographic action at low temperature, it was clearly shown that it could be carried on at a temperature of -190° , although reduced in power to the extent of 80 per cent. For this purpose sensitised paper was sponged in one part with liquid air, and then exposed to a bright light. The contrast between the part so cooled, where apparently no change had taken place, and the reduction on the remainder of the paper was very evident. The question thus arose as to whether photographic action would cease entirely if we had a temperature of -273° , that of absolute zero. This, of course, can not be settled until the variations in photographic sensibility at various temperatures have been determined by experiment and indicated by a curve. In conclusion Professor Dewar referred to the possibilities of the nature of this phenomenon of phosphorescence. As the matter stands it is pure speculation. If chemical, it is certainly the only kind of chemical action at low temperatures. If physical it may be regarded as the equivalent of some mere physical change which might be termed latent vibration, but it may at least be stated that photographic action and phosphorescence are intimately connected, and thus fluorescence, phosphorescence, and photographic action blend one into another.

In his second lecture on the internal framework of plants and animals, on January 23, Professor Stewart

dealt first with the principal stiffening or supporting element in the higher flowering plants, namely the wood, of which he followed the development and explained the structure. It was shown that in the winter bud of the ash tree, for example, there are contained the rudimentary leaves ready for rapid elongation in the spring; the fibro-vascular bundles from these, the Professor explained, passed into the stem and united with the bundles from lateral branches, as well as from previous leaves, to form a ring. The further growth of this ring was effected by the activity of the cambium, which produced wood, with vessels and fibres, on the one side, and phloem, with sieve tubes and bast fibres, on the other. The lecturer next described the formation, in the vessels of the wood thus produced, of a resin or gum resin, usually dark in colour, which both blocked up their cavities and passed by infiltration into the walls of neighbouring cells, rendering them impervious to aqueous fluids; the wood thus affected was called duramen, or heartwood, and its function was purely mechanical.

Professor Stewart next considered the remarkable branched cells found in the leaves of various species of *Camellia* and *Araucaria*, and illustrated his remarks by a description of those present in the leaf of *Welwitschia*, pointing out the purely mechanical nature of the function they discharged, and showing the manner in which the walls of some were further strengthened by a deposition of crystals of calcium oxalate.

With these remarks the lecturer concluded his account of the internal framework of plants, and passed on to consider that of animals. From the lower forms of Protozoa he selected the sun animalcule as an illustration, and drew particular attention to the protoplasmic threads which assisted the animalcule to procure food, and possibly served for purposes of locomotion; in these threads a finer supporting filament could be seen. In *Acanthometra* a central mass of protoplasm was enclosed in a perforated organic membrane, and surrounded by vacuolated protoplasm; the protoplasmic threads in this case were enclosed in delicate tubes composed of acanthin; in other allied forms silex, the supporting material, was siliceous in its nature.

This lecture, like the previous one, was illustrated by sketches on the blackboard, and by preparations of the bud of the ash, *Welwitschia*, sun animalcule, etc., exhibited under the microscope.

CHEMISTS' ASSISTANTS' ASSOCIATION.

There was but a scanty attendance at 103, Great Russell-street, on the 17th inst., which was variously attributed to the fact of the Chemists' Ball having been held the night before, and to the weather. Mr. R. H. Jones, the President, occupied the chair, and after the minutes of the previous meeting had been read and confirmed, Messrs. Horatio N. Bolton, A. G. Phillips, and J. E. Saul were elected patrons of the Association. Mr. J. S. Ward then read his paper entitled "Sophistication a Century ago." In an interesting sketch of the methods of adulteration practised, some amusing quotations were given from Smollett's works, to show the nature of the impurities met with at that time amongst the apothecaries'

stocks, and allusion was made to the antagonism which afterwards existed between the apothecaries of the old school and the medical profession proper, just as the pharmacist of to-day is engaged in strife with the stores. Writing about the year 1783, Dr. James refers to the sophistication of various preparations. Thus elaterium is described as the "expressed juice of the spruce larch thickened with mucilage of gum tragacanth," whilst balsam of Peru was nothing more than liquid storax. Aloe was made up of a mixture of gamboge and hepatic aloes. At that time it may be noted that the price of Barbadoes aloes was about 3s. 6d. per lb., whilst Socotrine aloes was a shilling less. The composition of some of these drugs certainly reflected credit upon the inventive faculties of the sophisticators. Thus we find Chian turpentine composed of olive oil, yellow resin, and Canada balsam; syrup of violets of orris root, sugar, and water, coloured with indigo; oil of laurel of lard, palm oil, green ointment, and rape oil. Mr. Ward had taken the trouble to prepare adulterated specimens of oil of aniseed, balsam of Peru, Chian turpentine, aloes, and dragon's blood, according to old formulæ, so as to give some idea of the nature of the products.

With regard to the means by which these admixtures were detected, physical tests were, of course, mostly relied on. Chaff, hair, bran, and sawdust were met with in liquid storax; balsam of Peru when adulterated was of very thick consistence, and with difficulty soluble in spirit; whilst musk was a conglomeration of skin, blood, and various refuse matter. The best variety of civet came from America, whilst the sagapenum had a different appearance to that now met with in commerce. The use of drugs and chemicals in the manufacture of beverages was noticed. Thus alum was used in wine-making, and oak sawdust for red wines; gypsum and sugar of lead for "clearing," and cayenne pepper to impart pungency, with quassia as a substitute for hops.

In the discussion which followed the opinion was generally expressed that the sophisticated specimens of dragon's blood and Peru balsam would pass muster even at the present day.

The thanks of the meeting were, on the motion of Mr. J. C. Strother, seconded by Mr. E. W. Hill, accorded to Mr. Ward.

ROYAL MICROSCOPICAL SOCIETY.

The annual meeting of this Society was held at 20, Hanover Square, W., on January 16. The President, A. D. Michael, Esq., F.L.S., was in the chair. After the report of the Council for the past year, and the treasurer's statement of accounts had been read and adopted, the President announced that the following were elected as officers and Council for the ensuing year:—President, A. D. Michael, Esq., F.L.S.; Vice-Presidents, Professor L. S. Beale, F.R.S., Dr. R. G. Hebb, E. M. Nelson, Esq., T. H. Powell, Esq.; Treasurer, W. T. Suffolk, Esq.; Secretaries, Professor F. Jeffrey Bell, Dr. W. H. Dallinger, F.R.S.; Ordinary Members of Council, T. D. Aldous, Esq., O. Beck, Esq., A. W. Bennett, Esq., Dr. R. Braithwaite, Rev. E. Carr, Frank Crisp, Esq., E. Dadswell, Esq., G. C. Karop, Esq.,

C. F. Rousselet, Esq., Dr. H. C. Sorby, F.R.S., J. J. Vesey, Esq., and T. Charters White, Esq.

The President then delivered an address, the subject of which was, "The History of the Royal Microscopical Society." He said that if any of his hearers would leave that West-end abode of science and journey eastward to Tower Hill, and thence by Sparrow Corner along Royal Mint Street, he would find himself in Cable Street, St. George's in the East, not a very quiet or a very clean locality: turning down Shorter Street he would emerge opposite a space of green, where once stood the Danish church with its Royal closet reserved for the use of the King of Denmark when visiting this country. The space is surrounded by houses which have seen better days, and amongst them, between a pickle-factory and a brewery, stands a rather dilapidated erection which is 50, Wellose Square; where, in 1839, lived Edwin J. Quekett, Professor of Botany at the London Hospital; and there, on September 3 of that year, seventeen gentlemen assembled "to take into consideration the propriety of forming a society for the promotion of microscopical investigation, and for the introduction and improvement of the microscope as a scientific instrument." Among the seventeen were N. B. Ward—the inventor of the Wardian case, which is not only an ornament to town houses, but was the means of introducing the tea-plant into Assam and the cinchonas into India—who became treasurer of the Society; Bowerbank Lister, who has been called the creator of the modern microscope; Dr. Farre; Dr. George Jackson; the Rev. J. B. Reade; and the enterprising and scientific nurseryman, George Loddiges. Most of these subsequently became presidents of the Society. A public meeting was held on December 20, 1839, at the rooms of the Horticultural Society, then at 21, Regent Street, when the "Microscopical Society of London" was formally started. Professor Richard Owen (not Sir Richard at that time) took the chair, and became the first President; and shortly after the famous John Quekett became secretary, an office which he held almost to his death.

At this moment Schleiden in Germany was commenting upon the paucity of British microscopical research, and attributing it to the want of efficient instruments, not knowing that a society was then forming which was to raise British microscopes to probably the first position in the world. The President then traced the history of the Society through the presidencies of Dr. Lindley, the botanist, Professor Thomas Bell, the zoologist, Dr. Bowerbank, Dr. George Busk, Dr. Carpenter, Dr. Lankester, Professor W. Kitchen Parker, all deceased; and of others equally famous who are still living; and showed how, under its influence and by its assistance, the vast improvements in the microscope, and the enormous extension of its use, had gradually arisen. He also described its connection with the origin of the 'Quarterly Journal of Microscopical Science,' the 'Monthly Microscopical Journal,' and other publications, besides its own present widely circulated journal with its exhaustive summary of microscopical and biological work. He related how on John Quekett's death certain members

of the Society subscribed to purchase for the Society's collection a curious microscope which Quekett possessed, and which had been made by the celebrated Benjamin Martin about 1770, probably for George III., and how they extended their subscription so as to provide a medal to be called "the Quekett medal," to be given from time to time to eminent microscopists: and how, difficulties having arisen, it happened that the only Quekett medal ever awarded was given to Sir John Lubbock.

Finally the President considered the future of the microscope and the prospects of further improvements. He said that many people were of opinion that the instrument is now perfect, and that consequently the most important *raison d'être* of the Society was over; he by no means agreed in that view; he believed that there was as much scope for progress in the future as there had been in the past. It was not by any means the first time that this idea had been put forward. In 1829, Dr. Goring, then a great authority on the subject, wrote in one of his published works, "Microscopes are now placed completely on a level with telescopes, and like them, must remain stationary in their construction." In 1830, less than a year after, appeared Lister's epoch-making paper, "On the Improvement of Achromatic compound Microscopes," and we have been improving ever since.

Mr. H. Virtue Tebbs proposed a vote of thanks to the President for his address, this having been seconded by Professor Bell, was carried unanimously.

UNIVERSITY COLLEGE (LONDON) CHEMICAL AND PHYSICAL SOCIETY.

At the meeting held on January 16, a paper was read on—

OPIMUM.

BY ROBERT D. LITTLEFIELD.

It dealt with the history, cultivation, and constitution of the drug. In the course of his remarks the lecturer referred to ancient records of opium, mentioning Scribonius Largus, A.D. 40, who gave an account of opium preparation, and Dioscorides, A.D. 70, who recorded the fact that the juice of the whole opium-bearing plant is less active than that of the capsule alone. Later, Pliny, in addition to noting its preparation, describes its medicinal use. In ancient Latin records reference is frequently made to *Larkia papaveris*, indicating that at that time even opium was looked upon as a valuable drug. Concerning the cultivation, an explanation of the formation of the latex in the plant was given, and the general manner in which the capsule was incised, the juice scraped off, and collected.

The plant as cultivated in Asia Minor usually has white or purple flowers, and blooms in May to July according to the elevation of the land. A naturally rich and moist soil is required, and a drought, frost, or locust pest may wreck a good healthy plantation. The opium specimens shown, kindly lent by Messrs. Hearon, Squire, and Francis, were then explained, the various characteristics being shown distinguishing the Asia Minor, Turkish, Indian and Egyptian varieties. The peculiar narcotic bitter smell and taste were pointed out, and concerning the composition, the

lecturer said that roughly speaking half of a sample of opium consisted of albumen, fruit, juice, gum, fragments of leaves and rubbish, and the remainder contained the alkaloids, sugar, and according to Hesse, some wax. The acids present are sulphuric, phosphoric, and the one peculiar to the poppy, meconic acid.

The inorganic constituents are potassium, magnesium and calcium oxides. The list of alkaloids in opium hitherto found, though very great (some twenty or so), was possibly not yet complete. Some were entirely absent from samples of the gum, and if present were only there in minute traces. Morphine and its derivative apomorphine (discovered by Matthieson and Wright), codeine, and narcotine were the principal ones. The method of assaying the morphine in opium as given in the B.P. was explained.

The morphine existing in the opium as sulphate and meconate is soluble in excess of calcium hydrate. This solution is treated with S.V.R. and ether in certain proportions, and the addition of ammonium chloride causes the precipitation of the morphine, which is insoluble in the S.V.R. and ether mixture, whereas other organic substances which the NH_4Cl throws out are soluble; so that morphine was obtained in a practically pure state, and can be weighed after the necessary drying. After reference to apomorphine, some tests for morphine were shown, and emphasis was laid on the reaction of neutral ferric chloride on an aqueous solution of opium, the beautiful red-coloured solution produced (that of meconate of iron) being unaffected by mercuric chloride. This being an almost conclusive test for meconic acid, inferred the presence of opium in the solution tested.

In a discussion which ensued, Dr. Norman Collie referred to the ferric chloride test. He stated that some of the acetone-acetyl derivatives gave this colour exactly, and that this fact very possibly indicated the presence of this group in the formula of meconic acid. Mr. Das also mentioned the effect and use of opium smoking and eating in Northern India. He remarked that the belief there was that the use of the drug was beneficial in preventing the severity of malarial attacks and also the intensity of poisonous snake bites.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

The annual meeting of the forty-sixth session was held in the Royal Institution on Thursday, 17th inst. Mr. John Smith, newly-elected President, in the chair.

The minutes of the previous meeting were approved and several donations to the library announced. Mr. J. B. Beckwith was elected a member.

The annual report of the Council was then read by the Hon. Sec. (Mr. A. S. Buck), and Mr. R. Parkinson (Hon. Treasurer), presented the financial statement showing a balance in favour of the Association of £18 8s. 4d.

On the motion of the President, seconded by Mr. Hooken, these statements were adopted.

Messrs. A. C. Abraham, Dutton, Hornblower, Overton, Parkinson, J. Smith, and J. J. Smith were elected members of the Council.

After the usual vote of thanks had been accorded to the donors to the library and museum and to the authors of papers during the late session, also to the officers and Council for their services, the President delivered the following:—

INAUGURAL ADDRESS.

It is my duty on the occasion of the opening of this session, to address some observations to the members on such subjects as appear to me to call for comment. Seeing that we inaugurate a session which shows this Association to have existed for nearly half a century, one is tempted to look back upon the work done by the Association and to the honoured names long connected with it. But though a creditable history has its usefulness in stimulating effort and promoting aspirations, in this utilitarian age we estimate the value of an institution from its performances at the present time and its promise for the near future rather than its past.

The aims of the Association amply justify its existence, and that those aims are not altogether missed is manifested by the regular attendance at the meetings of a fair number of active co-operators. If the Association falls short of its capabilities, the responsibility rests mainly upon those who have withheld their assistance. The first of the rules of the Association says it "shall have for its objects the advancement of chemistry and pharmacy, and the furtherance of the trade interests of members engaged in the same." It will be readily admitted that chemistry and pharmacy receive a proper amount of attention, and that the time spent upon those subjects is profitably employed. The occasional evenings spent at these meetings, looked at in a purely commercial light, have always appeared to me an excellent investment. The miscellaneous information that is circulated has a value in pounds, shillings and pence, which it would be unwise to underrate, and which few of us can afford to despise. We have also opportunities for making acquaintance and conversing with men whose interests and sympathies are in line with our own. It is by such means that unity and consolidation are promoted, and that ways and means are discovered for defending our interests when they are threatened.

Among trade matters which have recently engaged attention, I think the revision of the 'Liverpool Chemists' Retail Price List' deserves mention. A very great deal of time and thought have been devoted to it, many changes and additions have been made; and in every case where an alteration is recommended, either in the direction of higher or lower price, it has not been done without sound reasons. It is a book which ought to be in the hands of every chemist in this district, and not in this district only.

In this matter of prices, I am disposed to think that chemists too often stand in their own light by quoting for small quantities when price is asked. The grocer or store-keeper sells his carbonate of soda by the pound or half-pound, the chemist more frequently in one or two ounce packages, and as the price for the smaller quantity must be proportionately higher, the

two prices are sharply contrasted, to the prejudice of the chemist as a retailer. The system recommended in the Liverpool Price List is an admirable one, and should be generally followed; that is, when no pound price is mentioned, of charging the same number of shillings per pound as pence per ounce. We have got into a groove of small transactions which is not good for us; the public would esteem us more highly if they spent more money with us, and we ourselves would profit in more than the immediate gain by effecting the larger, rather than the smaller sale. The following words, taken from the *Pharmaceutical Journal* of December 1, are worth repeating:—"The pharmacists' charges should be classed under three distinct heads: The highest remuneration for purely professional work, such as dispensing and analysis; the next for semi-professional work, such as the supply of drugs and chemicals, which he personally guarantees; and the lowest for purely trading operations, such as are involved in the sale of articles which he simply hands over in the same condition as he receives them."

I submit that the attitude respecting prices which all engaged in pharmacy should take is correctly indicated. It is certain that without a fair average remuneration we cannot continue to prosecute our business as a source of livelihood.

When the quiet seasons of the year are with us we incline to the opinion that we can only maintain our position by reducing prices. This is in some cases done, the lead is followed by the nearest competitor, who perhaps goes one better (or worse); he, again, is followed by his neighbour on the other side, and so the thing spreads, the end being that profits are reduced without any appreciable increase of business. I do not, on the other hand, recommend excessively high charges, such as were sometimes made years ago, and would be inconsistent with the present conditions of business. But there is a middle ground.

In all large towns, as well as drug-selling grocers and drapers, there can be found a few successful, or apparently successful, cutting men who are on the Register, and who stand out with some prominence, due to their cheap-jack methods of advertising; but there are others, and many of them, who have adopted this system of business and have failed to succeed. Fortunately there are also many successful ones who follow what we are accustomed to regard as higher and more legitimate methods of business. In the great majority of cases I believe the success to be that of the man, not of the system, and that the one who succeeds as a cutter would have been equally successful on other lines.

As a body we appear to be getting crowded out, pushed into corners, and it must be that in the struggle we are lacking in some essentials. I have long had a strong conviction that our long hours of business are responsible for many of our deficiencies. We have amongst us men of intelligence, perhaps above the average, the finer side of whose character is cultivated and developed, but who in their business are unable to earn more than will furnish a bare subsistence for themselves and their families. The present

conditions require that our attention must be fixed upon business for thirteen, fourteen, and even fifteen hours out of the twenty-four. If we incline towards scientific studies, we find that with frequent interruptions consecutive thought is impossible. We must do our reading as we take our meals, in snatches; we must not discuss controversial subjects with our patrons; we are not free to mix with the world as others do even in sociable intercourse with friends. In other words we miss the sharpening influence of freer contact with men of the world. These conditions cannot but have a deteriorating influence upon us as individuals and as business men. The looker-on, who is said to see the most of the game, would say that these conditions could not fail to give rise to a non-development of character, in consequence of which a man so placed would be unable to do justice to his natural abilities; that the individuality which is the source of success would be restricted.

Business capital consists not only in stock, fixtures, and bank balance, but to a very large extent in the man himself; in the intelligent thought and study by which he keeps himself informed of recent knowledge in connection with his business, and in his knowledge of the world and of human nature. It is rarely that this capital can be used to the best advantage where the mind is confined in one groove for thirteen hours in each day.

I think the principle is now very generally accepted that the value of output is increased by diminishing the hours of labour—within reasonable limits, of course—and it would be worth the while of chemists to give this matter their serious consideration. We suffer under a tyranny by which we are injured in health of mind and body, and in domestic comfort; we concur in an evil which has no compensations. As individuals we are the victims; collectively we are the oppressors.

What I have said applies with equal force to Sunday trading; it is deplorable that an educated and highly intelligent man should be called upon to supply confectionery and articles for the table such as mustard and vinegar on the one day of the week when he should be free to spend some portion of his time in leisurely rambles in country lanes, or in the restful contemplation of such beauties as nature has provided his locality with.

I do not think it necessary to deal in advance with the argument that medicines are required on Sundays as on other days, and late as well as early; I know how much and how little force there is in that argument.

It is not a voluntary nine o'clock closing hour I am now advocating. To use a historic phrase, "I would not take my coat off" for that. This Association has on former occasions endeavoured to organise a voluntary early closing movement, and we all know how short a time the arrangement lasted. Experience has shown voluntary agreement to be futile: nothing but the compulsory powers of an Act of Parliament can effectively deal with this evil. The Bill which Sir John Lubbock proposes to bring before the House of Commons in the next session is one which, in my

opinion, we ought to do something to assist. The Bill could not be in better hands. Sir John Lubbock is a humanitarian and man of science more than a politician, and perhaps no man in either House of Parliament would have greater influence upon a question of this kind. In addition to Sir John Lubbock, the movement is receiving the active support of Mr. Chamberlain, who includes it in his unauthorised programme, and, however opinions may differ respecting Mr. Chamberlain's politics, there can be no doubt that his advocacy of the measure will have great weight in some quarters. As well as the two I have named the Bill is backed by seven other members. It will be remembered that in the last session of parliament a resolution in favour of compulsory early closing of shops received the support of a majority of the members present, and though it may be said that it was a snatch division, it is certain that the question is now "within the range of practical politics," and it remains for those interested to make their wishes known. If the chemists of Liverpool are in favour of this measure, and desire to strengthen the hands of the leaders of the movement either by resolution or petition, I am sure this Association will lend its assistance as it has always done when the interests of registered chemists in this locality are concerned.

I know there are many members of this Association and many others who are not members, but whose assistance at these meetings would be welcome, to whom my remarks upon the subject of early closing would have no application; but I am sure they will not regard the time spent upon a subject of such commanding importance as wasted, and that they would be more than willing to help forward anything that would add to the happiness of their brother chemists less fortunately situated. As a class, we miss the varieties and amusements of life and the thousand and one things that are factors in the formation of character and make life worth living. Let us hope for a fairer prospect in the future, and, at the same time, let us remember that we have no right to look to others to accomplish for us that which we have neglected even to assist in.

Education and examination continue to receive a considerable amount of attention. In reference to the "First" examination of the Pharmaceutical Society, I would support those who advocate a higher standard. The standard that is recognised by the medical faculty is quite low enough. Without the basis of a good earlier education, many of the terms used in botany, chemistry, and physics are meaningless sounds, and the committing them to memory is of the nature of "cram." I also support the curriculum scheme of the Pharmaceutical Society. Of the schools of pharmacy of which I have any knowledge, my opinion is that they do what they profess faithfully and well, and that tuition is not merely just as much as is necessary for the student to pass an examination. If the student will give himself sufficient time, he will emerge with a sound and lasting knowledge of his subjects; but it is impossible that a large amount of detailed knowledge acquired under a

few months' instruction can take a permanent abiding place.

We learn that the Council of the Pharmaceutical Society is considering whether or not an amended Pharmacy Act should be attempted. It is not worth while repeating any of the arguments from our point of view against unqualified limited company pharmacy, nor perhaps is it necessary to urge upon the committee of the Council the importance of that question. In the face of such activity and wise discrimination as have been displayed by the Council of late years, I have confidence that they will neither "rush in where wise men fear to tread," nor hold back from an attempt for fear of failure if a reasonable prospect of success offers.

If the President will tell us in plain words that by relinquishing what is called the "Widows' Clause" he believes we would be in a position to effectually deal with the store question, I think he might count upon a large number of new entries to the Society. For my part, I am not at all sure that the clause is an unmixed good. Most of us know of widows who have carried on businesses with some success; but how many are there who, having tried it, have come to grief? And the circumstances of competition and the character of the business combine to make that practice more difficult and unprofitable each year.

In conclusion, gentlemen, it is not necessary for me to say that in choosing subjects for remark I have made no ambitious selections. There are many other opportunities for discussing scientific and technical subjects; and pharmaceutical progress is ably reviewed and chronicled in our trade journals. The topics I have dealt with are amongst the little things which combine to constitute an important whole. I have spoken of things which are as familiar to all here as to myself, and of some things in which you may have but a passing interest, and yet which are sapping the energies and injuriously affecting the well-being of some thousands of our fellow-chemists throughout the country. But it is only by calling attention to and inviting discussion upon these subjects that grievances eventually come to be redressed or bubbles are burst.

Mr. A. C. Abraham proposed a vote of thanks to the President for his interesting and practical address. This was seconded by Mr. J. J. Smith and supported by Messrs. Parkinson, Wardleworth, and Cowley. The President then replied, and the meeting terminated.

CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

A meeting of the above was held at the Society's Room, 18, St. Edward's Passage, on January 18, Alderman Deck, President, being in the chair, and a large number of members present.

Mr. Ernest S. Peck, gave a lecture on
WATER ANALYSIS.

He commenced by quoting the various sources of water supply, and drew a diagram of the section of a well he had seen in a country village, showing its close proximity to sources of sewage contamination.

He explained the care requisite for the collection of a fair sample for analysis in properly prepared bottles, and showed how the quantity of total solids was arrived at, determining the amount of chloride present by means of standard solution of silver nitrate.

Then followed the free and albuminoid ammonia estimated by the Nessler test. The presence of nitrates was detected, and the hardness of water and microscopical examination were touched upon.

The experiments were successfully carried out with specially arranged apparatus kindly lent by Mr. C. J. Heycock, M.A., King's College. After considerable discussion a hearty vote of thanks was proposed by the President, seconded by Mr. A. Ivatt, M.A., supported by Mr. A. S. Campkin, J.P., and carried by acclamation.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

At the meeting of this Association on January 16, Mr. J. Rymer Young presided, and a paper was read on:—

CELL FORMATION AND CELL CONTENTS.

BY CHARLES TURNER.

The author dealt with the nature and occurrence of "pyrenoids" and discussed their use in the economy of the plant. They were described as spherical or lenticular bodies occurring in certain Algae, especially in the Conjugatae, *Spirogyra* being given as an example. They are imbedded in the chlorophyll band and appear to be in intimate connection with the nucleus by bands of protoplasm, whilst they are usually surrounded by a number of small starch granules, and their outer layer stains purplish with iodine. These facts lead to the idea that they are connected with the chlorophyll and nucleus in the elaboration of starch. A lucid description was then given of karyokinesis or the mitotic or indirect division of the nucleus in cell formation, and attention drawn to the different parts of the cell connected with this change.

By means of lantern slides the centrospheres were shown, first in their original position, close together just outside the nucleus, then in the position they take up when division is about to occur, on opposite sides of the nucleus and connected by means of kinoplasmic threads. The chromosomes forming the nuclear disc were shown, as well as their division, the method of which was explained, and finally the gradual formation of a layer of granules of cellulose in the equator of the cell, which coalescing, formed the new cell wall.

The cell contents were treated in a most comprehensive and instructive manner, and by means of a selection of slides Mr. Turner succeeded in making clear to his audience many difficult points in the anatomy of the plant. The contents of the living cell were described, the parts played by the formative and nutritive cytoplasm explained, and the plastids were referred to at some length. The green chloroplastids which are situated in the more external layers of tissue, so as to be acted on by the sun, under the influence of which they produce the starch supply of the plant. The chromoplastids, are

colouring matters other than green, and are generally derived from the chloroplastids. They are most frequently found in the floral envelopes. The leucoplastids are buried in the interior of the plant away from the light, and are specially numerous about the nucleus of the cells. They are colourless bodies so long as they are not exposed to the action of light. The purpose they serve is the formation of starch grains. They form these grains on their external surface instead of within themselves, which is the case with the chloroplasts. On being exposed to light they take on themselves all the functions of the chloroplasts, into which they are, in fact, converted. The tonoplasts were referred to as the agents which promote the formation of vacuoles in the young cells. The elaioplasts are specially connected with the formation of oil. Many very useful notes were given on the cutting, clearing, staining, and mounting of the various tissues, the articles appearing in last year's *Pharmaceutical Journal* being specially mentioned in connection with this subject, the lecturer mentioned Hanstein's violet as a valuable re-agent in the staining of bark tissues.

The Chairman afterwards presented the prizes gained by candidates in the recent herbarium competition. The successful competitors in the Senior Division were: Fred. A. Howorth, R. A. Sykes, Ernest H. Jones, Thos. Wm. Burch. In the Junior Division the prize was gained by T. O. Barlow.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

At the meeting held on January 16, Mr. Alexander Sutherland, President, in the chair, the following papers were read:—

METHODS OF DETERMINING MOLECULAR WEIGHT.

BY A. MACKENZIE.

The author gave an interesting account of Gay Lussac, Hoffman, and Victor Meyer's methods of determining vapour density, and exhibited and described the apparatus employed. He also explained the silver method for acids, platinum for bases, and Raoult's freezing method for neutral salts.

WEIGHTS AND MEASURES.

BY C. A. MACPHERSON.

The author gave a historical sketch of the origin of standard weights and measures, tracing them from the rude methods adopted by primitive races. He showed how many of these still survived in common use, and also showed the connection between them and the present more refined methods recognised among civilised nations.

In the absence of Mr. McEwan, the other notes were postponed to a future meeting.

The reading of the papers was followed by a discussion, taken part in by Messrs. Coull, Duncan, Hill, Mackenzie, Macpherson, and Sutherland, and, on the motion of the Chairman, a hearty vote of thanks was awarded to the authors.

Reviews and Notices of Books.

ST. THOMAS'S HOSPITAL REPORTS. Edited by Dr. T. D. ACLAND and Mr. BERNARD PITTS. Vol. xxii. Pp. i-xviii., 1 to 614. 8s. 6d. London: J. and A. Churchill.

The amount of work accomplished every year at the large metropolitan hospitals is so great that it is an arduous task to analyse it even in its scientific aspects alone. The editors of the present volume are to be congratulated upon the completeness and precision with which they have presented the classified results of the work done in the medical, surgical, and obstetrical departments of their hospital. The value of the volume to medical men is enhanced by original articles bearing on pathology and practice. Among these we notice one by Mr. Edmund White on sterilised dressings and sterilised water (see *Ph. J.*, ante, p. 191). The dressings are exposed to the action of steam at a pressure of 18-20 lbs., i.e., to a temperature of about 125° C. By this means sterilised, though slightly damp, dressings are obtained. If some fibrous absorbent substance could be found capable of bearing dry sterilisation, that is, a temperature of 150° C. for half an hour, it would seem to be a great gain.

To St. Thomas's men the collected annual reports have an interest beyond their great scientific value: they constitute a history of their medical *alma mater*. The present volume records the sadly premature death of W. B. Hadden, assistant physician. Dr. Hadden was cut off by pneumonia at the age of thirty-seven, when full of energy and promise of a continuation of the great services he had already rendered to his profession. The volume contains also a memorial of George Rainey, who worked at the medical school for sixty years, and the account of whose life is also a record of the changing fortunes of St. Thomas's Medical School, first at London Bridge, then at Surrey Garden, and finally facing the Houses of Parliament. Rainey is remembered as a little, rather handsome old gentleman in a black dress coat and suit, his tail pockets bulging out behind in a rather pronounced manner, for they contained his lunch and often various other things too numerous to mention. He was born at Spilsby in Lincolnshire, and sent to school in the neighbouring town of Louth. At school he said he learned nothing except to cheat the masters. He was first apprenticed to a doctor at Horncastle. The boy ran away after a few days; packed up his clothes, and walked home—a distance of thirty miles. He was then 'apprenticed in his native town, where he served his time, rising at three o'clock in the morning to study Latin, Greek, French, chemistry and mathematics, yet not neglecting his master's business. He managed to earn a little money by teaching, and in 1824 was able to enter as a student at St. Thomas's. Here he had to pay his way and live as a grinder, or coach, and in the course of time was appointed curator of the museum, and, later, demonstrator of human anatomy and of the microscope.

Great men live most after death, and Rainey's name will be remembered as the man of his time who was able to show how nature works by simple physical processes in the most complex organism. In his little room at London Bridge he was surrounded by his many experimental apparatus, microscopes, plants, injecting apparatus, and slides innumerable. Though so quiet and unassuming, he was a man of strong likes and dislikes, and could express himself in a way quietly, severely, satirically, and emphatically, to make folks acknowledge and feel his power; and this power lay in the possession of a large knowledge of science in all its branches, and a vast experience of human nature as seen in students. But this was not all that people felt, for they were conscious of his possessing, and expressing also without reserve, the supremest contempt and scorn for those who gave themselves airs, or assumed a wisdom they did not possess. Even great scientific men—great in public estimation—were not exempt from his scathing criticism. These are a few brief extracts from this charming and sympathetic memoir, written by Dr. W. W. Wagstaffe, of Sevenoaks.

ASTHMA AND CHRONIC BRONCHITIS. A new edition of notes on Asthma and Bronchial Asthma. By JOHN C. THOROWGOOD, M.D., F.R.C.P. Pp. i-vii., 1 to 136, 4s. London: Baillière, Tindall, and Cox. 1894.

This small volume, according to the preface, embodies work previously published by the author, together with the experience of more recent years. The evolution of modern ideas and beliefs regarding asthma are given. The author favours the view that ordinary intermittent asthma is due to reflex nerve-influence acting on the musculature of the bronchi. The views of most modern authors are referred to, but, after careful reading of the book, one is bound to feel that much of the pathology of asthma is still obscure. Berkart's view that in many cases anatomical deficiencies, due to rickets in early life, underlie the condition, and that slight bronchial inflammation and consequent plugging of bronchi and collapse of areas of lung determine the attacks, seems not to have received sufficient attention. Where conjectural pathology prevails, as it does wherever groups of symptoms such as constitute the various forms of asthma are dignified by the name of a distinct disease, treatment is apt to be of an indefinite nature. "The treatment must be aimed first at the removal of any morbid condition from which reflex spasm may arise. Naso-pharyngitis must be cured or a polypus removed. Secondly, any gouty or rheumatic tendency in the constitution must be dealt with by suitable diet and medicine. Lastly, persistent bronchial inflammation and thickening of the air-tubes, as in bronchitic asthma, must be removed by suitable treatment." These imperative preliminaries may prove more arduous than the paragraph just quoted seems to imply, but the reader must allow for limitations of space as well as limitations of art.

Correspondence.

AQUA CHLOROFORMI.

Sir,—Kindly allow me to reply to the comments of Mr. W. Martindale and Mr. Percy Wells on this subject, published in your last week's issue. The main point of my paper was the ready attainment of an automatic constant supply of a saturated aqueous solution of chloroform at ordinary temperature, the accomplishment of which, in consideration of the very prevalent use of aqua chloroformi as a diluent, I regarded as a desideratum. Attention was also drawn to the fact that such saturated solution constituted aq. chloroformi U.S.P., and that three parts of the same when diluted to four constituted the B.P. preparation. Now, Mr. Martindale's first objection is, "the time (twenty-four hours) required to make a saturated solution by Mr. Elborne's process is too long"; here after having figured the process advocated, Mr. Martindale confounds it with the preliminary experiment upon which it was based. Can "too long" be urged as an objection to the acknowledged prototype, the B.P. process for a "gallon" of camphor water, requiring an initial rest of two days? His next objection is "want of definite strength and probable variability of the product, the strength and rate of saturation varying with the temperature." To meet requirements in respect to rate of saturation I specified seven days as the initial period of rest, and as regards the want of definite strength, the solubility of chloroform in water at ordinary temperature is, like that of camphor and certain calcium compounds, of an exceptional character, namely, inversely as the temperature, but the increments of variation for a few degrees either above or below the average atmospheric temperature, 15°C., are so minute that if such refinements of temperature are to be entertained in pharmacy, we must also object to the B.P. process for so important a preparation as lime water, since it has been shown that one part by weight of CaO is soluble in—

at 770.....791.....868 parts of water
10° 20° 30° Centigrade.

Yet surely sir, from a practical point of view, and in the absence of any fundamental disparity, to so object would be straining at a gnat, but Mr. Martindale does more than this, for in his statement that "by the B.P. process the quantity of chloroform there ordered can be made by agitation in twenty seconds, and the product is definite in strength," he swallows the camel, for in the light of his own argument about temperature would not the mass of both the "fluid drachm" of chloroform and the 25 fl. ounces of water each vary according to the temperature at which they were measured? and on account of the very expansive nature of rectified spirit, would not his suggested product "*cum spiritu*" prove still more indefinite? Mr. Percy Wells will, I hope, find a sufficient answer in the above.

WILLIAM ELBORNE.

University College Hospital, W.C.

THE ATMOSPHERE OF THE SUN.

SIR,—Your correspondent, Mr. R. Goodwin Mumbray, does not appear to be very well versed in the physical and chemical constitution of the sun. To reply fully to the questions he raises would occupy very much more space than could be afforded in the Journal, deeply interesting though the subject is. Spectroscopic observations have distinctly shown that the elements existing in the atmosphere of the sun (so far as we now know them), are present there as metals and not as oxides, and even that if oxygen were present in the solar atmosphere, the

temperature is such that dissociation would inevitably follow. The light and heat emitted from the sun must therefore be accounted for in other ways than that suggested by Mr. Mumbray, i.e., that they are due to the combustion of carburetted hydrogen by oxygen. Various theories have, of course, been put forward, some physical, some chemical, and the late Sir W. Siemens enunciated at the Royal Institution a theory which, if it could be substantiated, would seem to indicate that the solar heat and light could be maintained to eternity. With regard to the flames mentioned by Mr. Mumbray, it has been shown by Mr. Lockyer that the sun is surrounded by an envelope, the chromosphere, some 800 miles deep, and from this the prominences (the flames) ascend, not for 700 miles, as Mr. Mumbray states, but from 20,000 to 100,000, or even 200,000 miles, at the rate of from 100 to 150 miles in every second. All observers agree that these effects are due to hydrogen chiefly, even if some other element, having a density still less than hydrogen, is not also concerned in the production of this wonderful phenomenon.

St. Leonard's Road, Croydon. J. H. BALDOCK.

"HABENDA RATIO VALETUDINIS."

Sir,—Mr. Hyslop and others who take an interest in the matter may like to have their attention drawn to the following passage in Cicero's 'De Senectute,' chap. xi. :—*"Pugnandum tamquam contra morbum sic contra senectutem habenda ratio valetudinis; utendum exercitationibus modicis; tantum cibi et potionis adhibendum ut reficiantur vires, non opprimantur."* "*Habenda ratio valetudinis*" is usually translated in this passage, "We must pay attention to health." The above quotation would appear to show the source from which the Society's motto was taken.

Chancery Lane, W.C.

A. H. DAWES.

. The same reference to the actual source of the quotation is given by another correspondent. [Ed., Pharm. Journ.]

AMENDMENT OF THE PHARMACY ACT.

Sir,—In view of the Law and Parliamentary Committee being called together on an early date to consider the proposed "Amendment of the Pharmacy Acts," I think the time opportune for the trade at large to bestir themselves in this matter. I venture to suggest that meetings be arranged for in the various towns, in order that chemists may consider and determine what the proposed amending Act should contain; whether it ought to deal with companies, or in what way it could best be drawn up for the best interests of the trade. That this may be done effectually, the Council could authorise the secretary and assistant-secretary to write to the local secretaries, requesting them in the name of the Council to convene such meetings of masters and assistants (whether connected with the Society or not) on an early date for the purposes already mentioned, and that the decisions of the various meetings be forwarded to the Council. I think, sir, in a question of this kind, which ultimately concerns every chemist, it would be a good plan when "light and leading" is desired on any vital subject, for the local secretaries to convene meetings of their brethren for the discussion of such questions and to report the result to the Council. In this way any ground for complaint on the part of those hitherto and at present dissatisfied with the policy of the Council might be removed, and the Council given at least a chance of doing what it has long promised to do, if only backed up by the "voice of the trade."

Dundee.

AN ASSOCIATE.

QUALIFIED ASSISTANTS ABROAD.

Sir,—I daresay this subject has been rehearsed, discussed and discussed on previous occasions, but it is all the better; it should be again brought to the notice of Minor assistants who intend to trap themselves into a foreign engagement, in most cases to better themselves. The average terms as now offered are Rs.150, Rs.180, Rs.210, Rs.250 "out-doors" per calendar month, and passage paid out for a four years' agreement. On these petty returns (it may be said for professional services rendered) one can scarcely defray the necessities of life expense; because the first year's services, after paying for board, washing and the "numerous" other minor expenses which cannot be avoided, leaves a balance that can only partly provide for climatic clothing. At the end of two years' service, after living a very economical existence, the only harvest reaped is "clear of debt," and hence it takes the most of the spare rupees of the next two years to provide the passage home, probably with a broken constitution. The above is a correct and true statement of what a minor assistant generally experiences in an Eastern engagement abroad, yet there are exceptions, and that is very often where the establishment belongs to a British principal. One thing particularly to be noted is the number of native and oriental establishments who apply to English wholesale houses for qualified assistants, and although things are represented as being a "bed of roses," they very often turn out a "bed of thorns." In concluding, I might safely say that qualified assistants have no right to waste their best days abroad unless they are perfectly assured of getting a fitting remuneration for their foreign services.

Rangoon.

DISAPPOINTED.

AQUA CHLOROFORMI AND AQUA CAMPHORE.

SIR,—The process for the automatic production of chloroform water, described by Mr. Elborne in your issue of January 12, will be likely to prove useful in institutions like hospitals and public dispensaries where large quantities are required, and where absolute uniformity of strength may not be a cardinal requisite. In retail pharmacies, however, such a process would not be likely to be followed under any circumstances; for apart from the objection pointed out by Mr. Martindale, the official process is so simple and so easily carried out that, on a small scale at least, no improvement on the process is needed. The objection raised by Mr. Martindale to the automatic process applies equally, in my judgment, to the mode of preparation of those of the other medicated waters made by distillation of the dried drug with water. Such waters as those of dill, aniseed, cinnamon, fennel, caraway, and pimento, are bound to vary in strength, and in order to ensure uniformity some process of distillation of the corresponding oil with water, or of solution and filtration, ought to be adopted. I do not say that the need of uniformity is equally urgent in every case, but it would be a distinct advantage if, as a result of the discussion of the matter by pharmacists, the pharmacopoeial authorities could be induced to deal with all the members of such a group of preparations at the same time, and as far as possible, on the same lines. I know that in some quarters there is a predisposition in favour of waters distilled from the drugs themselves, but such predisposition is mainly the result of prejudice. I quite agree with Mr. Martindale that the official chloroform water is in many cases too strong to be taken undiluted; and as it is chiefly employed as a vehicle for other remedies the strength might without disadvantage be materially reduced. On one point of interest, though not of import-

ance, my experience does not coincide with that of Mr. Martindale. In his letter, published in your last issue, he says, "We rarely have more than a fluid drachm of spirit of chloroform prescribed in a 6 and 8 oz. mixture." On referring to my own prescription book, and taking the last dozen prescriptions for 6 or 8 oz. mixtures containing spirit of chloroform, I find that the highest quantity prescribed in a mixture is 6 fluid drachms, and the lowest 2 fluid drachms. The average amount is exactly 190 minims, or slightly over 3 fluid drachms. I should be interested to know whether these figures are exceptionally high, and whether the proportion mentioned by Mr. Martindale more nearly represents the general average. While writing upon the subject of chloroform preparations, I cannot refrain from expressing a hope that the forthcoming issue of the *Pharmacopoeia* may witness the deletion of one of those preparations, viz., the compound tincture. This is not only one of the least necessary, but also one of the most unpharmaceutical of official preparations. As to aqueous camphore, I feel sure that every pharmacist of experience will agree with Mr. Martindale as to the desirability of substituting the method for its preparation recommended in his letter, for the one at present official.

Buxton.

R. WRIGHT.

CORRECTIONS.

Sir,—Will you kindly make the following corrections in the otherwise correct report of my paper in your issue of January 19:—p. 615, col. 2, line 11 for "not in" read "not as in"; p. 615, col. 2, line 14 for "Milk of Sulphur-Sulphate of Calcium" read "Milk of Sulphur plus Sulphate of Calcium"; p. 615, col. 2, line 15, delete the words "in this"; p. 617, col. 1, line 22 for "have" read "has," as the reference was only to the syrup made in April.

Pollackshields.

THOMAS DUNLOP.

Answers to Correspondents.

Stammerer.—If you had referred to the review on page 351 as directed, you would have found that the book is published by the Savoy Press, London, at 1s. Send that amount to H. Kimpton, 82, High Holborn, London, W.C., and he will supply you with the book.

Wiggin and Son.—The formula is correctly rendered from the French.

Notices to Contributors.

* * Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

Advertisements must be sent to Street Bros., 5, Serle Street, Lincoln's Inn, W.C., where copies of the Journal may be purchased, and instructions from Members respecting the transmission of the Journal to the Secretary—Mr. Richard Bremridge—17, Bloomsbury Square, W.C.; otherwise delay may be caused.

COMMUNICATIONS received from Messrs. Ainsworth, Baldock, Balmforth, Baxter, Brown, Buck, Cartledge, Cooks, Dunlop, Elborne, Everett, Hewlett, Hill, Kemp, Laing, Lawton, Mair, Matthews, Moffat, Morley, Murray, Peck, Reeve, Robinson, Russell, Schacht, Shapley, Sherborn, Simmonds, Simpson, Vaughan, Wiggin, Wright.

"THE MONTH."

The Alkaloids of Ipecacuanha.

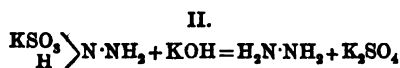
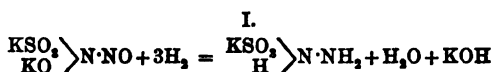
In the *Bericht* issued by the firm of E. Merck for 1894—just received—it is announced that the manufacture of the alkaloids of ipecacuanha, described in this Journal by Paul and Cownley (*ante*, p. 111.), has been undertaken by that firm, and that it is now prepared to supply both of the pure alkaloids, emetine and cephaeline, or their salts, as well as the mixed alkaloid of ipecacuanha, which has hitherto been known by the name of "emetine." This is a striking evidence of German enterprise in connection with chemical industries, which unfortunately has little corresponding manifestation in this country. In the account given of these alkaloids in the *Bericht*, it is stated, as the result of experimental trial, that the view put forward by Kunz-Krause in opposition to Paul and Cownley could not be adopted, but that the results obtained by Paul and Cownley in regard to the composition and character of emetine and cephaeline were fully confirmed in all essential particulars.

In connection with this subject it may be mentioned that Paul and Cownley have isolated a third ipecacuanha alkaloid, and they have succeeded in arriving at some knowledge of its general characters. It exists in very small amount in the root, and has been obtained by shaking the ammoniacal liquor—from which emetine and cephaeline have been separated—with chloroform, in which the alkaloid is very soluble. Ether dissolves this alkaloid very sparingly, but by evaporation of the ether solution the alkaloid has been obtained in transparent rhombic prisms, of a pale lemon-yellow colour, which rapidly darken when exposed to light. The alcoholic solution darkens much more rapidly. The very small quantity of this alkaloid obtained was insufficient for full examination, but it appears to have a higher molecular weight than emetine or cephaeline, and a melting point of about 138° C. It is distinctly alkaline, neutralises acids, and forms salts, which appear to be uncrystallisable. Solutions of the salts and of the free alkaloids appear to undergo rapid alteration under the influence of light, with production of dark yellow-brown coloured substances. In this respect the newly isolated alkaloid presents a marked contrast to the emetine and cephaeline, salts of which are unaffected by light, though the alkaloids very soon acquire a yellow colour when exposed to light.

Salts of Nicotine.

Parenty and Grasset, in a paper on the manufacture and physiological properties of the oxalate and other salts of nicotine, show that whilst the fatal dose of pure nicotine is from 20 to 21 Mgm. per kilo. of animal, that of combined nicotine is 70 Mgm., whilst that of the quadoxalate may be as much as 150 Mgm. per kilo. The physiological effects of the latter illustrate, in a minor degree, the same general character as pure nicotine—contraction of the pupils, paralysis and convulsions, salivation, etc.—but it was proved by experiments that animals could become accustomed to take larger quantities daily than the normal fatal dose (*Comp. rend.*, cxix., 1273).

The preparation of this interesting body, discovered by Curtius in 1889, has been both indirect and difficult. The methods have generally depended on reduction, or reduction and hydrolysis of complex diazo-, nitrosamin-, or nitramin-derivatives of the aliphatic series, such as amido-guanidin ($\text{NH}_2\text{C}(\text{NH})_2\text{NH}_2$), or diazo-acetic ester ($\text{CH}_2\text{N}_2\text{COOEt}$). Duden has now been able to prepare this compound from an inorganic salt by reduction. For this purpose he uses the salt obtained by the action of sulphurous acid on potassium nitrite—a compound of potassium sulphite with nitric oxide, $\text{K}_2\text{SO}_3\cdot\text{N}_2\text{O}_2$, and by reducing this in alkaline solution at a low temperature with sodium-amalgam he obtains hydrazine and potassium sulphate. The first stage consists probably in the reduction to a salt of hydrazine, which is then hydrolysed by alkali according to the following equations:—



The hydrazine was identified by the formation of the sulphate and the compound formed with benzaldehyde-benzal-azin (*Ber.*, xxvii., 3498).

Critical Point of Liquids.

Having previously shown how mere traces of alcohol in chloroform or ethyl chloride cause a notable variation in the temperature of the critical points of those liquids (*ante*, p. 626), R. Pictet now deals with the influence of solids in a similar direction when dissolved in the liquids. Borneol, cineol, terpineol, phenol, guaiacol, and iodine were each dissolved in pure sulphuric ether (c.p. 189°), alizarin was dissolved in alcohol, and borneol in ethyl chloride (c.p. 181°), and the following results are recorded:—

Substance.	Weight of		Temp. of Critical Point.	Variation	
	Solvent.			B.P. C.P.	
Borneol .. 0.5 Gm.	Ether....	25 Gm.	197°	0.2	8°-0
Cineol 0.5 "	"	25 Gm.	198°	0.2	4°-0
Terpineol. 0.5 "	"	25 Gm.	197°	0.2	8°-0
Borneol .. 45.0 "	"	155 Gm.	296°		107°-0
Phenol 0.5 "	"	25 Gm.	201°	0.1	12°-0
Guaiacol ... 0.5 "	"	25 Gm.	195°	0.3	6°-0
Iodine 1.0 "	"	80 Gm.	198°	0.2	6°-0
Borneol .. 1.0 "	Ethyl chloride	50 Gm.	191°	0.2	10°-0

Borneol was found to remain dissolved in ether vapour, alizarin in alcohol vapour, etc., etc., at temperatures below the fusion points of the respective solids (*Comp. rend.*, cxx., 64).

Illicene.

Schneegans and Bronnert report on a new hydrocarbon, illicene, which they have found in combination with fatty acids in young holly bark. The body crystallises from alcohol and melts at 182°-183°; ultimate analysis indicated the empiric formula C_7H_{12} , and determinations by the Raoult-Beckmann method the molecular formula $\text{C}_{33}\text{H}_{60}$. Young dry bark contains about 2 per cent., the leaves much less. The authors are prosecuting their investigation of this interesting body (*Archiv.* cxxxii., 532).

Assay of Zinc Salts.

Barthe has described a method of determining the purity of the salts of zinc, either by determining the excess of acid or the actual amount of zinc. The process depends on the use of standard alkali and of the two indicators—tincture of holly-hock (*rose trémière*) and phenol-phthalein. The analysis is conducted in two stages, and is as follows:—The salt under examination, the sulphate, nitrate, etc., is dissolved in water, and the excess of acid, if any, determined by titration with decinormal potash, using tincture of holly-hock as an indicator. The reaction is complete when the colour changes to green, but it is necessary to work with very dilute solutions to obtain accurate results. With another portion of the salt a solution is made and alkali added till the red colour of phenol-phthalein is permanent. The amount of alkali required to react with the zinc is now obtained by subtracting the volume of alkali used in the first operation from that of the second, and then calculating for the formation of the salt $(\text{ZnO})_4\text{ZnSO}_4$, or every cubiccentimetre of $\frac{N}{10}$ potash used will represent $\frac{0.00325 \times 5}{4}$ grammes of pure zinc (*Bull.*, xiii., 82).

A New Element.

Dr. Bayer thinks he has discovered a new element among the bye-products left after the extraction of aluminium from red bauxite. The liquors contain chiefly sodium carbonate and sulphate, together with chromic, vanadic, molybdic, silicic, arsenic, phosphoric, and tungstic acids, as well as alumina, magnesia, lime, etc. The supposed element exists in the liquors in the form of an acid, which is soluble in water and forms yellow crystals. The solution is not precipitated by sulphuretted hydrogen, but may be obtained on evaporating its solutions as a bluish-violet oxide, which subsequently becomes further oxidised and lemon-yellow in colour. The latter compound, which probably corresponds to the formula R_2O_6 , has marked acid tendencies, and forms characteristic compounds with different bases. The spectrum of the new body exhibits characteristic lines in the green, blue, and violet, and it is suggested that Dr. Bayer has discovered one of the missing elements predicted by Mendeléeff in the nitrogen-phosphorus group (*Bull. de la Soc. Chim.* [3], xi., 1155).

The Protomorphic State.

A. Villiers has previously suggested (*ante*, p. 608), that nickel and cobalt sulphides may, at the moment of their formation, be in a different condition to that in which they normally exist, and this condition he now proposes to term the "protomorphic state" (*état protomorphique*). It appears also in the case of other sulphides, and is more evident in some than with nickel or cobalt. Recently precipitated zinc sulphide, for example, does not change immediately in the cold, though very rapidly when heated, and it is probable that manganese sulphide may also be found to illustrate protomorphism (*Comp. rend.*, cxix., 97).

Melanthin.

W. v. Schulz reports upon the physiological action of the body melanthin isolated by Greenish from the seeds of *Nigella sativa*. This substance has been shown by Robert to resemble the saponin of quillaia bark, and by Schulz to be a member of the homologous series of saponins of the formula $\text{C}_n\text{H}_{2n-8}\text{O}_{10}$. The

experiments made showed that melanthin exhibited the typical physiological action of the most poisonous saponins (sapotoxin, cyclamin); the lethal dose for cats was determined to be about two milligrammes per kilogramme (*Pharm. Zeitschr. f. Russland*, xxxiii., 51).

Silver Sulphide.

A. Ditte describes how silver sulphide, kept cool and in the dark, changes in a short time in the presence of a saturated solution of potassium sulphide. From black it turns red, forming small crystals, which are but little soluble in the solution, and have, when dried in an atmosphere of carbon dioxide, a composition which may be represented by the formula— $4\text{Ag}_2\text{S} \cdot \text{K}_2\text{S} \cdot 2\text{H}_2\text{O}$. The same compound is formed on boiling together silver and potassium sulphides. It is altered by light and decomposed by water, the latter reaction allowing the silver sulphide to be obtained in the form of greyish-black crystals. A double silver and sodium sulphide can also be prepared, though not in the cold, the red crystals having the composition— $3\text{Ag}_2\text{S} \cdot \text{Na}_2\text{S} \cdot 2\text{H}_2\text{O}$, and being at once decomposed by water (*Comp. rend.*, cxix., 91).

Preparation of Amorphous silicon is prepared by Amorphous Vigouroux by the reaction of magnesium with silica, thus— $\text{SiO}_2 + 2\text{Mg} = \text{Si} + 2\text{MgO}$.

The silica (180 Gm.) and magnesium (144 Gm.) are mixed with magnesium oxide (81 Gm.), and heated in a furnace previously heated to a red heat. The reaction occurs in two or three minutes, raising the temperature to 540° , and a mass is obtained which, after drying, yields a brownish, homogeneous powder, containing from 99.09 to 99.60 per cent. of silicon, when pure materials are employed (*Comp. rend.*, cxix., 94).

β -Oxycinchonine. By the prolonged action of 50 p.c. sulphuric acid on cinchonine, at 120° , α -oxycinchonine and β -oxycinchonine are formed. Jungfleisch and Léger describe the latter as occurring in small prismatic needles when crystallised from strong alcohol. These are colourless, anhydrous, and strongly dextrogyre, melt at 273° (corr.), but at about 250° become slightly coloured. The compound is almost insoluble in water, but soluble in cold alcohol and very soluble in warm. It is an energetic base, and its formula is $\text{C}_{38}\text{H}_{28}\text{N}_2\text{O}_4$. It forms two classes of salts with monobasic acids— $\text{C}_{38}\text{H}_{28}\text{N}_2\text{O}_4\text{A}$, and $\text{C}_{38}\text{H}_{28}\text{N}_2\text{O}_4\text{A}_2$. Most of the salts are distinctly crystalline (*Comp. rend.*, cxix., 1268).

Caffeine and Cheap Tea.

Caffeine, for which there seems to be a considerable demand, is chiefly made from the sweepings of tea warehouses, which can be purchased at about 4d. or 5d. per lb. Recently some enterprising Germans have hit upon a method of getting their caffeine for next to nothing. The tea sweepings have been bought in the London market, taken to Germany, all the actual dust tea removed by sifting, and the coarser particles of tea, after passing over a magnet to remove particles of iron, have been returned to the London market and offered as drinkable tea. The character of this tea was detected by the use of a lens, which revealed the particles of wood arising from the opening of tea chests in dock warehouses. These it is impossible to remove from the tea sweepings. The residual dust serves as the source of caffeine.

Purity of Drugs, etc. L. F. Kebler has examined samples of honey which contained an excess of chlorides and was supposed to have been adulterated with glucose, in the preparation of which hydrochloric acid had been used. On inquiry it was found to have been accumulated from a "salt marsh," and a complete examination was therefore made to determine whether the environment might not account for the excessive proportion of chlorides. The result was as follows:—Average percentage of water, 16.13; ash, 0.25; reducing sugar, 68.19; pollen-grains in abundance; sulphates, a trace; chlorides, excessive. It was considered, therefore, that the samples represented natural products. Three samples of pyrogallol examined by the same writer had the following melting points—116°–118°, 116°, and 117°, respectively. They were probably mixtures of pyrogallol (m.p., 131°) and catechol (m.p., 111°). Of four samples of light oil of wine, varying in price from 80 cents to \$4.50, one was entirely fusel oil, two were mixtures of ether, alcohol, and small quantities of heavy oil of wine, and the fourth was approximately a mixture of equal parts of commercial ether and heavy oil of wine. Four out of ten samples of oil of sassafras approximately complied with the U.S.P. requirements, one consisted of commercial saffrol, and the remaining five of "artificial sassafras oil," produced by fractionating camphor oil. Finally, examination of two samples of ipecacuanha root by Kebler's process showed that the thick annulated or "fancy" root (1.67 per cent. alkaloid found) is frequently not as valuable as the "wiry" root (2.39 per cent. alkaloid found), whilst titration with volumetric acid solutions gave most encouraging results (*Am. Journ. Pharm.*, lxxvii., 26).

Piper Clusii. Herlant has contributed to the study of useful plants from the Congo territory, by examining the fruits known as "Poivre de Clusius." He finds that they contain 11.5 per cent. of volatile oil and 5.0 per cent. of piperine, either free or in the form of a compound which is decomposed by solvents. The detection and localisation of the latter body can be best effected, according to the author, by the persistent yellow colour it produces in contact with hydrate of chloral; it exists only in the albumin. In assaying it the solvent action of sodium salicylate was utilised to separate resinous matters; the amount of piperine thus determined proved to be less than is present in black pepper, but Herlant thinks they could be used either as a source of piperine, or, if deprived of part of their volatile oil, as a condiment. Although its structure resembles that of cubebs the fruit is to be classed with the peppers containing piperine (*Acad. Roy. de Méd. de Belgique*, 1894, 115).

Tolu Balsam. P. Oberländer has subjected balsam of tolu to chemical examination, and finds the resinous portion to consist of tolu-resinotannol in combination with cinnamic and benzoic acids, the latter in small proportion only. In addition the balsam contains 7.5 per cent. of an acid, aromatic, oily liquid, principally benzyl benzoate, with a little benzyl cinnamate and .05 per cent. of vanillin. Neither styracin, free benzyl alcohol, or phenyl-propyl cinnamate could be detected. The balsam is a pathological product, and in this respect, as well as in

its chemical composition, resembles balsam of Peru. The lamina of the leaf of the *Tolulifera balsamum* L. contains schizogenous ducts just on the boundary between palisade and spongy parenchyma, and in the midrib. Small twigs exhibit a number of such ducts, but during the secondary growth they are completely thrown off and no new ones formed. The bark of older stems, which is entirely free from schizogenous ducts, was found to contain phloroglucin, tannin, phlobaphene, traces of wax, sugar, and coumarin, but none of the constituents of the balsam (*Archiv.*, ccxxxii., 559).

Paraffin and Theobroma. Pfister draws attention to a paraffin oil that is being offered to chocolate manufacturers as a substitute for oil of theobroma. A sample examined by him was white with a slightly yellow tinge and distinct blue fluorescence, possessed a specific gravity 0.869, and boiled at over 300° C. An adulteration with such a body could readily be detected by the usual saponification methods (*Forschung's Berichte*, I., 543).

Arabino-chloralose and Xylo-chloralose. It has been found by Richet that by substituting for the glucose used in preparing chloralose other sugars such as arabinose or xylose, similar compounds to the soluble and insoluble varieties of glyco-chloralose may be obtained in each case. The arabinose combination possesses but one half the toxic power of glyco-chloralose, and the convulsions produced by the latter, resembling those occurring in cases of strychnine poisoning, are not observed when poisonous doses of arabino-chloralose are administered. On the other hand xylo-chloralose causes similar convulsions to glyco-chloralose but possesses no hypnotic power. It would appear possible, therefore, by combining chloral with various sugars, to prepare a series of chloralose-like bodies, of which the hypnotic and stimulant effects are dissociated and varied within extensive limits (*Répertoire* [3], vii, 29).

Activity of Digitalin. Dr. G. Bardet has compared the therapeutic activity of crystallised digitalin with digitoxin, and concludes that the former is the only product obtained from digitalis possessing a really definite, constant, and well-known action from a therapeutic point of view. Digitoxin differs both from crystallised and amorphous digitalin, and is described as an indefinite mixture, with variable activity. Amorphous digitalin probably resembles digitoxin in containing a glucosidal body possessing considerable activity, which, however, may vary. It is recommended that crystallised digitalin alone should be prescribed (*Journ. de Pharm.* [6], I., 27).

Solubility of Strontium Bromide. M. Fonze-Diacon finds that the solubility of anhydrous strontium bromide in ethylic alcohol is practically constant between 0° and 40°, 100 Gm. of absolute alcohol dissolving about 64.5 Gm. of the salt, and forming a solution of which the density is 1.210 at 0°. Saturated solutions allowed to stand in stoppered bottles deposited in the course of several months fine crystals belonging to the orthorhombic system. On analysis these were found to contain 488/100 of alcohol, and composition is probably represented by the formula— $2Br_2Sr, 5C_2H_5O$.—(*Journ. de Pharm.* [6], I., 59).

Randia dumetorum. M. Vogtherr has subjected the fruits of *Randia dumetorum*, which are used in the East Indies as an emetic and as a remedy for dysentery, to chemical and microscopical examination. The poisonous properties of these fruits he attributes to a saponin, randia saponin, and to an acid, randic acid, which he has isolated from the pulp. The former of these bodies does not appear to stand in any near relation to Kobert's saponins; it resembles quillaia-sapotoxin in many respects, but differs in the proportion of sapogenin, yielded by its decomposition. Randic acid resembles Kobert's quillaic acid. The fruits were also found to contain a tannin and fat (*Archiv.*, cxxxiii., 489).

Structure of Sanguinaria Canadensis. In some further notes on the structure of this plant, Professor Bastin states that the red or orange-coloured secretion found in the rhizome is chiefly contained in distinct cells, which are either isolated or connected into irregular chains and distributed among the parenchymatous tissues of the middle bark and large pith. In the inner portion of the middle bark, however, and in the inner bark, occur chains of cells which are longer, more regular, and contain a yellow rather than an orange-red secretion. The cells composing the chains are also much narrower and more elongated than are the ordinary secretion cells. In most instances there is no apparent communication between the cells of these rows, the transverse partitions between the cells being imperforate. "In a few instances, however, particularly in the inner layer of the bark, there is demonstrable connection between the secretion cells of the chains, which thus form a true laticiferous tissue, essentially like that occurring in many other of the Papaveraceae, though of course much less complex in its development." These milk-tubes are seldom more than a dozen cells long and are seldom branching, the reticulate form of laticiferous tissue being found only in the most rudimentary stage of its development. The secretion cells contain resins as well as alkaloidal principles, and it seems probable that the salts of sanguinarine are more abundant in the large orange-red secretion cells of the pith and outer portion of the middle bark, while those of chelerythrine are more abundant in the smaller yellow cells and laticiferous tubes of the inner bark and inner part of the middle bark (*Am. Jour. Pharm.*, lxvii., 4).

Stamens in Saffron. Dr. F. Ranwez directs attention to the adulteration of saffron by the addition of the stamens from the same flower. Their detection is easy when the saffron is whole for, though the stamens are yellow like the styles, the stigmas are red and usually attached to the styles, and in addition the form of each part is very characteristic. In powdered samples, however, detection of the adulteration is not so simple. When stamens are present to any extent the reddish tint of the powder is, of course, diminished, but there is no principle in the stamens that can aid in their detection by chemical means. It is necessary, therefore, to depend upon the anatomical structure, which is completely different in the male and female organs of the flower. The inner surface of the anther is formed of a layer of large cells the walls of which are thickened by characteristic spiral bands. Such

bands occur in nearly all stamens, but their form and size varies with the species of plant. Again, though saffron normally contains a little pollen, when stamens are present the proportion is greatly increased (*Ann. de Pharm.*, l., 6).

Pectase and Pectic Fermentation. Bertrand and Mallèvre conclude, as the result of investigations they have undertaken, that pectase exists in solution in the cell-sap of acid fruits as well as in the roots of carrots, insoluble pectase being absent. But in the juice of acid fruits the presence of the ferment may be masked by the acidity of the fluid, its action being rendered apparent after neutralisation only. Pectic fermentation is considered to depend upon the relative proportions of ferment, calcium salts, and free acids (*Comp. rend.*, cxx., 110).

Volatile Oil of Abies Balsamea. C. G. Hunkel gives the results of a re-determination of the physical constants of the oil distilled from the fresh leaves and a few cones of *Abies balsamea*. Analytical results indicated the presence of a large amount of an oxygenated compound. The specific gravity of the oil was 0.8892, and rotatory power $[\alpha]_D = -32.66$ (100 Mm. tube), the determinations being made at 20° C. The boiling point was unstable, and the first fractions obtained on distillation had an acid reaction, the decomposition of an ester being thus indicated. After saponification of the mixed fractions and distillation of the alkaline liquid with aqueous vapour, oil came over clear at first, but subsequently the distillate crystallised. M.p. of crystals, 198°-199° in a sealed tube; s.g. of oil, 0.8759, and $[\alpha]_D = -30.22$. On re-fractionation this oil congealed in the condensing tube, crystals having a m.p. of 201°-202° being formed. The fraction of oil distilling at 160°-165° had s.g. 0.8798, and $[\alpha]_D = -30.86$. It yielded but little pinene nitroso-chloride (crystals melting at 101°), but from the mother-liquor, after freezing for twenty-four hours, three separate crops of crystals were obtained, melting as 134°-5, 135°-136°, and 136°-5-137°-5, respectively. The total quantity was too small, however, for further examination. The fraction of oil distilling at 165°-168°, had a more distinctly terebinthinate odour than the preceding one, and had s.g. 0.8719, whilst $[\alpha]_D = -31.58$. The crystals melting at 201°-202° consisted of large shining plates, and were found to correspond with borneol, the same product being yielded by the fractions distilling at 168°-172°, and 172°-185°. The acid present was proved to be acetic, and it would appear that the oil contains pinene and bornyl acetate, both being levogyrate (*Am. Jour. Pharm.*, lxvii., 9).

Oils of Spike and Lavender. G. Massol has had an opportunity of determining and comparing the rotatory power of genuine oils of spike and lavender. The determinations were performed at 15° with a Laurent's polarimeter, a 100 Mm. tube being employed, and yielded the following results, the calculations being based on the

$$\text{formula } [\alpha]_D = \frac{c}{ld} -$$

	Rotation	Density
Oil of Lavender	-3°-70	0.930
" Spike	+9°-66	0.935

It is pointed out that these figures differ from those

formerly recorded, Buignet having published the following :—

Oil of Lavender	Rotation	Density
„ Spike	– 21° 20	0·886
	+ 3° 30	„

whilst Bruylants' figures were equivalent to—

Oil of Lavender	Rotation	Density
„ Spike	– 2° 29	0·876
	– 0° 35	0 908

Samples of oil kept by Massol in well-stoppered bottles, and exposed to diffused light for thirteen months, showed no variation in rotatory power. He concludes that Flückiger's statement that the rotatory power of essential oils must vary with their extremely variable composition is correct, and that, in view of the differences in the results published by different observers, the physical constants referred to cannot be depended upon to discriminate between the oils of two such closely allied species as *Lavandula vera* and *L. spica* (*Journ. de Pharm.* [6], I., 49).

A. Renard finds that 66 p.c. of the products of pine tar, distilling between 200° and 220°, correspond as to boiling point with ordinary creosote. The portion distilling between 200° and 210° consists of monophenols, 40 p.c.; guaiacol, 20·3 p.c.; cresol and its homologues, 37·5 p.c.; whilst the loss is 2·2 p.c. The fraction passing over between 210° and 220° does not contain guaiacol. Generally, the composition of pine creosote may be regarded, with reference to its guaiacol strength, as intermediate between that of the creosotes of beech and oak (*Comp. rend.*, cxix., 1276).

The influence of vegetation on the formation of atmospheric ozone, has occupied the attention of several observers from time to time, but the results of their investigations are more or less contradictory. As the result of more than 700 observations conducted during the months of July, August, September, and October of last year, J. Peyron has definitely formed the opinion that the production of ozone is favoured by vegetation. His experiments were performed at different times and in different places, with iodised starch paper, and he finds that the quantity of ozone produced is greatest when the surrounding vegetation is most active. During the whole course of the experiments, ozone was found to be present continually, both day and night, in country districts; but in Paris, during October, it was only detected during stormy weather with its accompanying atmospheric disturbances (*Comp. rend.*, cxix., 1206).

Some time ago G. J. Peirce showed how the haustoria of different parasitic plants penetrate the living tissues of the host plants (*Ph. J.* [3], xxiv., 345), and he has more recently shown that the same power exists in the roots of the pea, bean, turnip, and white mustard (*Bot. Zeit.*, lii., 169), seeds of the two latter enclosed between halved potato tubers forcing their roots through the substance of the potato, and even piercing the external cork layer in twelve days. No root-hairs were developed and no corroded starch grains were found, but the passage made by the root was surrounded by torn, dead, brown-walled cells, and it was concluded that the penetration must be due to mechanical pressure

and not to the action of a diastatic ferment. The external tissues of branches of an *Impatiens*, leaves of *Echeveria* and of an aloe, a leaf-stalk of rhubarb, and a stem of *Euphorbia* were also penetrated by the roots of seedling peas. The editor of *Natural Science* recalls an instance recorded by Rendle (*Journ. Bot.*, 1893, 193), in which shoots had grown inwards from the base of the eyes of a potato tuber, penetrating its substance and giving rise to thread-like roots and small tubers, the latter eventually bursting the skin of the mother tuber by their growth. The layer of cells lining the channels and cavities formed in the old potato lost their contents and their walls became corky, while layers of cork cells were formed on the surface of the young shoots and tubers.

Experiments are described by E. Assfahl that seem to indicate the possibility of glycerin affording nutrition to plants under certain conditions. Filaments of *spirogyra*, previously deprived of starch by being kept from the light for a prolonged period, on being immersed in a solution of glycerin, produced fresh starch in 2½ hours. This change, however, was only effected in the presence of light. The strength of the glycerin solution employed (0·2 per cent.) enabled the experiments to be continued for a prolonged period. A stronger solution (0·5 per cent.) was used with advantage for experiments of brief duration, but the presence of more than 1 per cent. of glycerin was found to cause ill-effects, whilst if the proportion were below 0·001 per cent., no appreciable alimentary effect was produced (*Ann. agron.*, and *Journ. de Pharm.* [5], xxx., 558).

Professor A. M. Edwards dispenses with the use of a funnel in cases of a difficult filtration through paper, replacing it by a piece of celluloid, in which numerous holes have been punched. This is bent into the shape of a funnel and supported in a retort stand ring. When not in use the celluloid can be washed and put away flat like a piece of paper (*Chem. News*, lxxi., 40).

A. Bach describes a new re-agent for demonstrating the presence of hydrogen peroxide, or other peroxide acting in a similar manner, in green plants (*ante* 173). The reaction is based on the fact that perchromic acid in ethereal solution readily converts aniline, in the presence of free acid, into a violet colouring matter. The best results were obtained with a solution containing 0·03 gm. of potassium bichromate and 5 drops of aniline per litre. On adding to a mixture of 5 C.c. of this solution and 5 C.c. of a dilute solution of hydrogen peroxide, equivalent quantities of different acids, and noting the time that elapsed before the coloration appeared, oxalic acid was found to act most decidedly and rapidly. The method adopted, therefore, was to mix 5 C.c. of the solution to be tested with the same quantity of the bichromate and aniline solution, and then add 1 drop of a 5 per cent. oxalic acid solution. A rose-violet coloration is produced in the presence of hydrogen peroxide, and readily contrasted with the result of a blank experiment, in which 5 C.c. of the re-agent, 5 C.c. of water, and 1 drop of the acid solution are mixed. The leaves of plants were treated with 1 per cent. oxalic acid solution, and the liquid subsequently tested as

above. Of twenty-five species of plants thus examined, eighteen gave a positive reaction (*Comp. rend.*, cix., 1218).

Iodine Disinfecting Box. Sir B. W. Richardson considers iodine to be one of the readiest and best of disinfectants, and describes anew his methods of using it. Rags dipped in an alcoholic solution of iodine may be suspended in rooms requiring disinfection, or a box containing iodine may be covered with muslin and exposed on the mantelshelf, or, again, the iodine may be quickly diffused as vapour by heating a saucer containing it. It is described as rapidly destroying the organic products which are the cause of disagreeable odours, acting in the same manner as chlorine, bromine, or ozone, being nearly as powerful as the first-named (*Asclepiad*, xi., 157).

Compact Portable Battery. What is probably the smallest, lightest, and most compact practicable galvanic cell, made is the Capo-Farad Battery, which yields a current of 2 amperes at a voltage of 1.1. It consists of a zinc cell 11/16 inch in diameter and 2 3/4 inches long, closed with a hard rubber stopper, and containing an electrode of fused silver chloride cast upon a zigzag silver wire, one end of which extends through a stuffing box in the cover and forms one pole of the battery. The zinc cylinder forms the other pole. Hard rubber discs hold in position the silver chloride rod, which is enclosed in textile material, while the space between it and the zinc is filled with fibrous material saturated with the electrolytic liquid used. A four-cell battery with case weighs but five ounces and is capable of performing useful work (*Scient. Amer.*, lxxii., 43).

Powdered Cinnamon. Pfister observes that of late years the quality of the lower grades of cinnamon bark and of powdered cinnamon, which is largely produced from the broken bark and siftings of such grades, has been very low. An attempt at improvement has recently been made by adding to such cinnamon the stalks of cassia buds which possess an unusually powerful odour of cinnamon. In the powdered drug such an admixture can be recognised by the small conical thick-walled hairs, long sclerenchymatous cells with large lumen, and the small spiral vessels. Pfister considers that such addition of cassia stalks to powdered cinnamon is admissible inasmuch as by the comparatively large proportion of volatile oil they contain, they tend to raise rather than lower the quality of the powdered drug (*Forschung's Berichte*, I., 540).

Boron Carbon Battery. Under the sensational title of "A Revolution in Voltaic Electricity," H. N. Warren publishes somewhat scanty details regarding a new form of voltaic cell, which is described as possessing special advantages in certain cases. It is made flat, with sliding carbon plates which have been previously impregnated with boron, soaked in solution of platinum oxalate, and heated to redness in an atmosphere of hydrogen. The plates are enclosed in a teak-wood box, and a flat porous cell encloses the zinc element. The only information given respecting the exciting agents is to the effect that the outer cell contains a "specially prepared manganic salt in admixture with other substances." The battery (one cell) is said to be "capable of producing 3 volts, and giving a constant current

from 2 to 2.5 for almost unlimited duration." The cells are arranged in series of three, and with twelve small ones arranged in series an arc was produced between carbon points, "more than the naked eye could bear," whilst "over two feet of platinum wire was raised to incandescence," and "the heat from the arc produced readily fused titanium, chromium, and tungsten, and volatilised platinum in quantity." The conclusion of the all too brief description states that the new cells are unrivalled as a lighting agent for lamps, and give off no fumes, whilst one usually suffices to drive a motor, and three for the entire electro chemical work of a large laboratory (*Chem. News*, lxi., 2).

Determination of Starch. P. L. Hibbard describes a modification of the method of starch determination which depends upon the use of diastase, that renders it much shorter and easier, as well as fairly accurate, whilst a further slight modification renders it the most accurate method known. The substance in which starch is to be determined is finely powdered, and enough to contain at least half a gramme of starch is placed in a flask with about 50 C.c. of water, and 1 or 2 C.c. of aqueous malt extract, prepared by covering powdered dry malt with water containing 15 to 20 p.c. of alcohol and filtering off the infusion after a few hours. The mixture is at once heated to boiling, with frequent shaking to prevent the formation of clots of starch. After boiling for a minute, cool to 50°-60° C., and add 2 or 3 C.c. malt extract, then heat slowly for 10-15 minutes till boiling, partially cool, and test with iodine solution. If there is any blue coloration, the treatment with malt extract must be repeated, but if all the starch is changed, cool the mixture, make up to a definite volume, and filter through linen or muslin. An aliquot part of the filtrate, containing 0.2 Gm. to 0.3 Gm. of starch, is placed in a 100 C.c. flask with 50 C.c. HCl (30 per cent.), and water to make up 60 C.c. Boil moderately for thirty minutes on a sand bath. Complete conversion will now have taken place, and on cooling the solution and nearly neutralising with sodium hydroxide, the dextrose is determined by Fehling's solution. The whole operation is said to occupy less than two hours (*Journ. Am. Chem. Soc.*, xvii., 64).

Kino in Wines. Kino has of late risen to the unusually high price of about 14s. per lb., in consequence of the demand that is stated to have arisen for it in giving colour and "edge" to port and Burgundy wines. As a consequence of its scarcity other varieties of kino are coming into the market, notably Bengal or Pulas kino (*Butea frondosa*), which is distinguished by having particles of bark always attached to it and by its ruby colour. African or Gambia kino (*Pterocarpus erinaceus*) has also been imported. It is smaller, brighter, and of a more purplish red than ordinary kino. This kind is the original kino, deriving its name from the African name of the tree "Kano," and its importation appears to date from about the year 1811. It is somewhat singular that it does not more frequently enter commerce, since the tree grows from Senegambia to Angola, and the tincture of this kino has the reputation of not becoming gelatinous when kept.

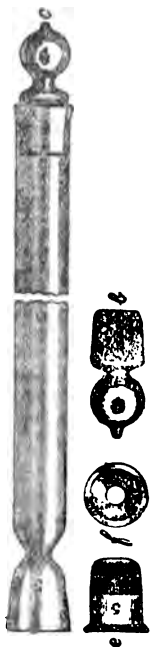
NOVEL LABORATORY DEVICES.



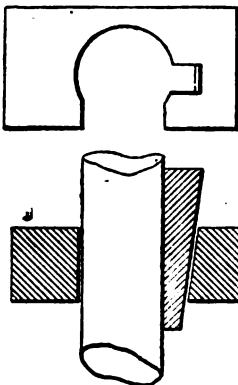
AUTOMATIC PIPETTE.—The pipette here illustrated has been devised by Emil Greiner (*Journ. Am. Chem. Soc.*, xvi., 643) for use when it is required to take a great number of samples of a given liquid in succession, and all of the same volume. The construction of the pipette, which automatically takes up the exact volume of liquid required, is sufficiently evident from the illustration, and it has been found practicable to make it in all sizes required up to 50 C.c. The necessity of drawing up the liquid by the mouth and watching the mark is entirely obviated, and the instrument would appear to be peculiarly adapted for use in cases where pipettes are used often and accuracy is desired.

LYSIMETER FOR DETERMINING SOLUBILITIES.—The lysimeter

(*lysis*, solution) has been found very serviceable by Charles Rice (*Journ. Am. Chem. Soc.*, xvi., 715) in determining the solubility of substances at high temperature, when the solvent is highly volatile. The idea upon which it is based is the separation from the original solution, which usually contains an excess of the substance in suspension, of a filtered portion at the same temperature as that of the former. The glass tube *a* is 15 Cm. long and 1 Cm. in external diameter, and is provided at one end with a well-ground stopper *c*, while the other end is cup-shaped and connected with the main tube by a contracted neck. A carefully ground glass bell *e*, having a perforation, *f*, at the bottom, is made to fit this cup, as is also the stopper *b*. Assuming that the solubility of morphine in boiling alcohol is to be determined, enough liquid must be provided to allow of at least one-half the tube *a* being immersed. The stopper *c*, and glass bell *e*, the latter filled with absorbent cotton and fastened in with thin platinum wire, having been placed in position in the tared tube, alcohol is boiled in a beaker or test-tube, and saturated with morphine, after which the prepared tube is immersed. When the apparatus has acquired the temperature of the boiling liquid the stopper *c*, is removed, whereupon the liquid filters upward through the cotton. To secure uniformity in the liquid, the filtered portion should be allowed to flow back once or as many times as may seem necessary. The stopper *c* is then re-inserted, the tube with-



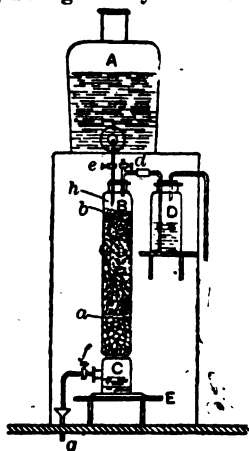
drawn and inverted, and the glass bell removed and replaced by the stopper *b*. After cleaning the tube with alcohol, it is allowed to cool, and the weight of the contained solution then determined. On transferring the contents to a tared beaker or capsule and evaporating, the weight of the dissolved morphine will be found.



CONVENIENT BURETTE CLAMP.—A convenient form of burette clamp is made by Clarence Quinan (*Journ. Am. Chem. Soc.*, xvi., 719), in accordance with the accompanying sketch, a simple wedge holding the tube in position. The holder is made, preferably, of maple, and the wedge of hickory or other hard wood. The surface of the latter should be slightly curved to en-

sure accurate contact, and cork is found unnecessary on the bearing parts, since very slight pressure on the upper end of the wedge causes the tube to be held with great rigidity.

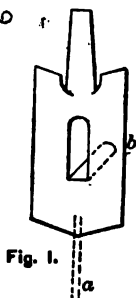
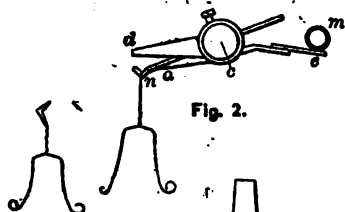
HYDROGEN SULPHIDE GENERATOR.—The apparatus described by H. G. Schanche (*Journ. Am. Chem. Soc.*, xvi., 868) has been proved, during seven years of use, to furnish always an absolutely uniform supply of gas. From the reservoir *A*, the acid passes into the generator *B*, which contains ferrous sulphide *a b* resting on coarse pebbles at *a*. The ferrous chloride formed collects in *C*, whence it may be removed easily from time to time by opening the cocks *d* and *f*, and so allowing the solution to flow through the lead pipe *g*, into a drip pan under the table on which the apparatus



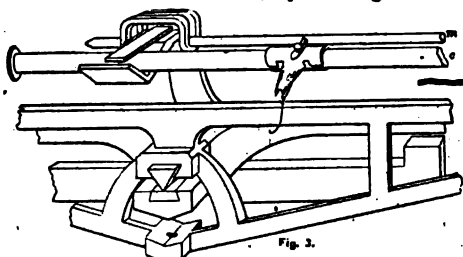
stands. The quantity of gas supplied is controlled by regulating the flow of acid by means of the cock *e*, and the supply is kept uniform by the height of the column of ferrous sulphide. As the acid percolates through this it is completely neutralised. *D* is an ordinary wash-bottle, and the shelf *E*, on which the generator stands, is easily slipped off its bracket, so that the generator can be readily removed for cleaning or re-charging.

SAFETY ATTACHMENT FOR RIDERS.—An arrangement, devised by Chas. E. Parker (*Journ. Am. Chem. Soc.*, xvi., 764), appears to possess advantages as regards simplicity, lightness, and adaptability, over others employed in manipulating the weighing riders of balances. A light glass rod *m* (Fig. 3), is fixed

parallel to the beam, behind and slightly above it. Then a piece of sheet brass—to which a piece of hair-spring from a watch, *a*, is soldered—(Fig 1, *b*) is bent,



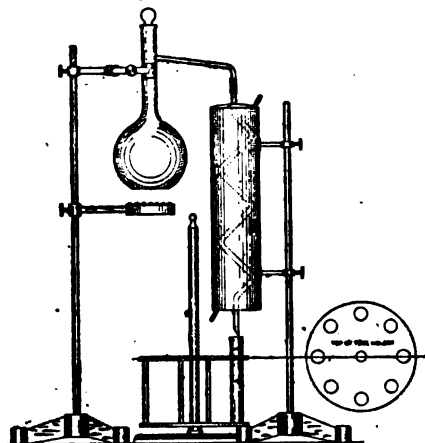
as shown in Figs. 2 and 3, to form a sleeve upon the rod *c*, together with a prong *d*, in opposition to the hook *n*, Fig. 2, by which the rider is usually lifted, and an extension *e*, under the rod *m*, which thus limits the rotation of the sleeve and prong in one direction. The usual hook arrangement is thus converted into forceps, which are normally closed by the spring *a*, and secure the rider. When, by turning the rod *c*,



the rider is lowered, contact between *m* and *e* checks the corresponding motion of the sleeve, thus opening the forceps, and, on continuing the movement, the rider is left hanging free upon the beam. The tension of the spring should be sufficient to close the orceps upon releasing the rod *c*. If it should be, at any time, desirable to leave the rider upon the beam, all that is necessary is to bend its loop as represented in the side sketch, Fig. 2.

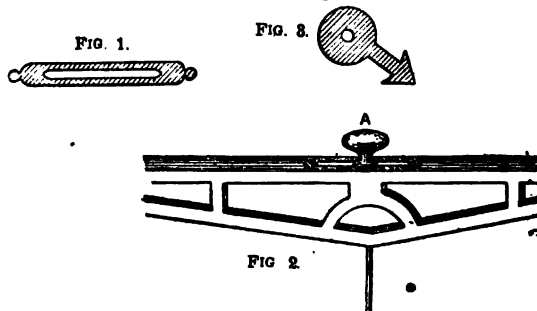
CONDENSER, AND REVOLVING NESSLER STAND.—In the condenser adapted by E. W. Martin (*Journ. Am. Chem. Soc.*, xvi., 871), and here illustrated, the three-eighths inch block tin pipe forming the condenser tube is bent in a zigzag shape, as affording a more even flow of the distillate than the conventional helix. The cylindrical copper jacket enclosing it is about fifteen inches long and four inches in diameter, and is closed at both top and bottom with discs that are arched upward. The effect of this at the lower fend is to prevent contamination of the distillate with any drip from the outside. To ensure the more certain delivery of the distillate the lower end of the tin tube is cut aslant. In the case of water analysis

distillations, etc., a stoppered glass flask with side-neck is used, the end of the latter being bent vertically downward, as shown, and thrust deeply into the condenser tube, being held in position by a short piece of rubber tubing. Martin's revolving Nessler rack is represented in the same illustration, and, as will be seen, consists simply of two circles of thin board connected by light strips of wood, the upper



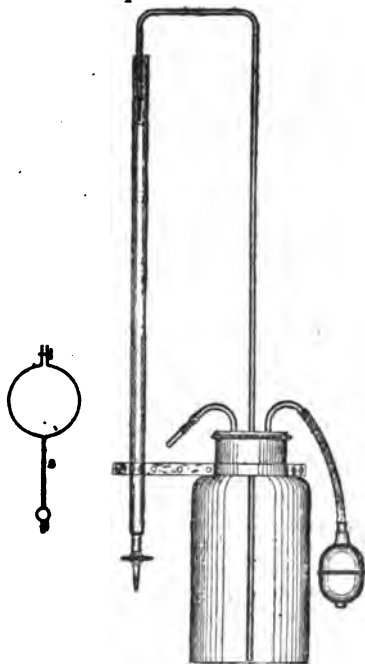
circle being perforated for eight or ten tubes, and the lower one partly perforated to form shallow sockets. The whole revolves about an upright set in a base, and if one tube in the rack be placed in position to receive the drip from the condenser, the others can be brought successively into the same position, and the order in which the fractions of the distillate are taken is easily preserved.

BALANCE-ADJUSTING DEVICE.—Balances used for analytical work are sometimes, and prescription scales generally, lacking in means of adjustment, and to remedy this defect, where it exists, Frank T. Green (*Journ. Am. Chem. Soc.*, xvi., 899) suggests a plan which is extremely simple and does not require special skill in its application. It is assumed that the beam has a centre screw (Fig. 2, *A*) on top, but



if not one can easily be added. The strip of brass (Fig. 1) is fixed beneath this screw in such a manner as to slide either to the right or left as required. When the point of adjustment is reached the brass strip is firmly clamped by means of the centre screw. An alternative plan is to employ an arrow-shaped piece of brass (Fig. 3), which is also fixed by means of the centre screw, the method of adjustment being simply to turn the arrow to the right or left.

BURETTE FILLER, AND NESSLER COMPARATOR.—In this arrangement for filling burettes, designed by Dr. A. P. Hallock (*Journ. Am. Chem. Soc.*, xvi., 870), a bottle containing at least 2 Lit., is fitted with a rubber cork and a brass collar which carries a burette clamp, the collar and clamp being made of two strips of brass, bent as shown to the left of the illustration, and soldered or riveted together at *a*. The ends are turned outwards and fitted with thumb-screws that serve to firmly clamp the circles. To fill the burette a finger is placed on the opening of the short bent tube to the left, and the indiarubber bulb is then squeezed so that the air in the bottle is compressed and the solution forced into the burette by means of the long tube. The latter is kept in position by a cork with a small slit on one side, or fitting loosely in the burette, and the end of it is slightly constricted and cut off at the zero line of the graduation. When the burette is full the air pressure is released by removing the finger from the short tube, and all the liquid above the zero mark then



syphons back into the stock bottle. The Nessler comparator, as improved by Hallock, has the form of a large black test-tube rack with ten or twelve holes. A strip of milk glass extends from end to end at the bottom, being held in place by small pieces of indiarubber fastened at each side by small screws, and so close to the base that the glass can just be forced in between. A similar strip of clear glass rests on cleats at the side of the rack, about two inches above the milk glass, being fixed in the same manner as the latter, and upon this clear glass the Nessler tubes stand. The standards are placed in alternate holes in the rack, the intervening spaces serving for the tubes to be compared, which need not be raised in order to make the comparison, whilst the whole apparatus is very readily cleaned and kept in order.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, FEBRUARY 2, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, — 17, Bloomsbury Square, London, W.C.

DEATH BY POISON.

THE Registrar General's Report for the year 1893 has just been issued, and as usual it contains a mass of detailed information on the subject of poisoning of a fatal nature, both accidental and suicidal. Other forms of death by poison are so few in number that for the purposes of review in this Journal they might almost be overlooked. The cases recorded as referred to manslaughter are five in number. In two of these carbolic acid was the cause of death; in two others deaths are attributed to ptomaines; and in the fifth case death is attributed to a drug used to procure abortion. There is only one case of murder in which poison was the cause of death, and the poison employed is stated to have been prussic acid and oil of bitter almonds.

The number of suicidal deaths by poison were 370, amounting to 14.23 per cent of the total number of recorded deaths by suicide. Out of the whole number in which poison was found to be the cause of death, there were 45 cases in which the nature of the poison is not stated, and 32 cases in which death was caused by one or more of eleven different kinds of poison, most of which are not included in the poison schedule of the Pharmacy Act. There were 128 cases where death was caused by carbolic acid and various acids not in the poison schedule. Of the remaining 165 cases in which death was caused by a scheduled poison, 67 are attributed to opium, morphine, etc., 40 to oxalic acid, 25 to prussic acid, 19 to strychnine, 5 to vermin killers, 5 to arsenic, 2 to mercury bichloride, and 2 to chloroform and chloral.

The number of deaths by poisoning caused accidentally or by negligence were 597, amounting to 3.48 per cent. of the total number of deaths caused by accident or negligence. Of that number the kind of poison causing death is not stated in 23 instances. In 206 instances death was attributed to one or other of thirty-eight poisonous substances not included in the poison schedule of the Pharmacy Act. There were 49 cases in which death is attributed to carbolic acid and various acids not in the poison schedule. This leaves 219 cases of deaths caused by scheduled poisons. Among these, 107 deaths are attributed to opium, morphine, etc., 65 to chloroform, 10 to chloral, 9 to ether and other anæsthetics, 7 to oxalic acid, 7 to strychnine, 6 to prussic acid and potassium cyanide, 4 to arsenic, 2 to ergot, and the remaining 2 to vermin killer and mercuric chloride.

QUESTION AS TO SUGAR IN NORMAL URINE.

THE controversy upon this subject promises to become still more interesting. In a letter to the *Lancet* Sir GEORGE JOHNSON criticises the tests employed by Dr. PAVY to furnish proof that normal urine contains sugar. He refers to the statement of Sir WILLIAM ROBERTS that according to his experience urine containing as much as 0.5 per cent. or 2.5 grains of sugar in the ounce gives no sign of the presence of sugar by that test. The formation of crystals in the phenylhydrazine test is also considered by Sir GEORGE JOHNSON to be fallacious evidence of the presence of minute proportions of sugar in urine. Hence he concludes that while the absence of sugar from normal urine has been established by positive and indisputable evidence, the supposed indications of its presence cannot be relied upon. We understand that further experimental results are likely to be produced in support of this view, and in any case, Dr. PAVY may be expected to offer a stout defence of the position he has taken.

THE TREATMENT OF DIPHTHERIA BY ANTITOXIN.

MR. LENNOX BROWNE gave his final lecture on diphtheria before a very full audience at the Central London Throat, Nose, and Ear Hospital on Tuesday, the 29th ult. Having detailed the treatment until recently pursued, he proceeded to discuss the antitoxin remedy. Stress was laid on two essential conditions for estimating its value; first, that every case so treated should be certified by bacteriological examination to be true diphtheria; and, secondly, that a post-mortem examination should be made in every fatal case so as to ascertain whether there was any truth in the suggestion that the serum treatment is in any degree capable of inflicting harm. In the meantime, taking the figures of one of the Asylums' Board hospitals, he showed that of forty-five cases of true diphtheria treated by antitoxin

since the commencement of the year, only two deaths had resulted, as against fifty cases with seventeen deaths in the same hospital in the corresponding period which immediately preceded. This result—which far transcended any previously attained—was due to the circumstance that antitoxin had been used, not as a substitute for, but as supplementary to, the former measures of treatment, especially those of an antiseptic and stimulant character. Mr. LENNOX BROWNE deprecated the teaching that the serum was to be used to the exclusion of all other remedies, on the ground that otherwise its full value could not be accurately estimated; remarking that it was not in consonance with the humane character of the British medical practitioner to make the saving of life in the slightest degree subordinate to a fair trial of a new remedy, and he ventured to prophesy that antitoxin would be acceptable and successful in proportion to its adoption as an auxiliary, and not as a competitor.

DISPENSING APPRENTICES.

UNDER this heading the *British Medical Journal* mentions a communication received from a correspondent, stating that he has a message boy who is giving him great satisfaction and would like to be apprenticed to the drug trade. In answer to the question whether, with the qualifications L.R.C.P. and S.E. and L.F.P.S.G., he could take the boy as an apprentice and give him a certificate at the end of his apprenticeship, our contemporary very properly replies that "such an apprenticeship would not confer any special qualification either as chemist or druggist or otherwise."

ARGON.

A LARGE and representative meeting of the Royal Society was held in the hall of the University of London on Thursday afternoon, to hear Lord RAYLEIGH and Professor RAMSAY give the results of their most recent work on the supposed new constituent of the atmosphere. Mr. WM. CROOKES had also been announced to give a description of the spectrum of the new "element." A full report of the proceedings will be given in next week's *Journal*, but, meanwhile, it may be as well to recapitulate the information on this interesting subject that has already been published. Lord RAYLEIGH and his colleague found that when electric sparks were passed through air containing an excess of oxygen, and the resulting nitrous fumes were absorbed by potash, a residue was left which consisted neither of nitrogen nor oxygen, and showed a special line in the spectrum. The gas has since been obtained in quantity by passing nitrogen obtained from air over red-hot magnesium, which gradually absorbs the nitrogen and leaves behind the "argon," which is said to constitute one per cent. of the atmosphere. Its existence, however, is said to be doubted by "orthodox" chemists, between whom and the "spectroscopists" or physicists the issue was raised at the meeting on Thursday.

Indian Medical Congress.

[FROM OUR SPECIAL CORRESPONDENT IN CALCUTTA.]

The first Indian Medical Congress, lately concluded at Calcutta, has been in every respect a brilliant success, having been attended by about 500 medical men from all parts of the empire and from different parts of the world—the total membership having reached close on 900. The only section of special interest to the readers of the *Pharmaceutical Journal* is that of

PHARMACOLOGY AND INDIGENOUS DRUGS.

The first of the two presidential addresses delivered in this section, was by Dr. George Watt, whose position as Economic Reporter to the Government of India affords him peculiar facilities for the prosecution in the most practical fashion of the Indian *Materia Medica*, of which, as indicated in his address, there is still a great deal to be learned. He strongly recommended students in this department to turn from books to the bazaars, and showed an interesting collection of drugs which he had lately made in the course of a short tour in the Kangra Valley, purchased chiefly from the native herbalists, and he was not surprised to learn that there were quite a number concerning which even the best informed on these matters were remarkably ignorant.

The most interesting of Dr. Watt's own recent discoveries in this department was a vegetable ferment "Mathosan" which he had found was sold largely in some parts of Northern India in the form of small cakes, and he was confident that it would be found very useful in place of yeast in bread-making and in the brewing industry. His suggestion that Himalayan gentian might be much more utilised than it is ought to receive the attention it deserves, especially in India. He advocated *Podophyllum emodi* once again as worthy of notice on the part of European pharmacognosists, and reminded the section that a research made some years ago showed that the Indian root was rich in podophyllin resin.

Several practical suggestions of great interest were embodied in the address of Dr. Watt's colleague in the Presidency of the Congress—Rai Bahadur, Dr. Kanny Loll Dey, C.I.E. It will seem inexplicable to many readers that the great Medical Store Departments of India rely but little on the medicinal resources of the country, but the suggested provision of suitable preparations ready for immediate use in the Government hospitals and dispensaries should result in some practical step being taken towards their utilisation. The great obstacle, however, to the more general adoption of the indigenous drugs, in place of medicines at present imported from England, in the great system of charitable medical administration in India, seems to lie in the fact—which was quite overlooked at the Congress—that no study of them is included in the *materia medica* of the Indian medical schools, which at the best is meagre and limited to the more prominent of the pharmacopoeial medicaments.

Dr. Kanny Loll Dey's suggestion that a drug emporium which would be central to the great markets of

the world should be established at Calcutta ought to be hailed with satisfaction by all who desire to see the standard of quality of medicines maintained. *Cannabis indica* grown in the Panjab—to give one important example—has suffered in quality, and consequently in reputation, through the necessity of sending it by rail to the Bombay markets, where it is very frequently mixed with the inferior hemp cultivated in Western India, instead of direct from the hills to Calcutta, where at present there is no proper mart for drugs on a commercial scale.

Dr. Dey's recommendations of drugs deserving of inclusion in the proposed Imperial Pharmacopoeia will be regarded as of some importance, coming as they do from an Honorary Member of the Pharmaceutical Society, and one who has made a study of Indian pharmacognosy for forty years. The herb *Adhatoda vasica* has a popular reputation all over India as an expectorant, and is deserving of more attention. The comparatively recent experience of the decided efficacy of the "Kreat" (*Andropogon paniculata*) in influenza may add weight to the recommendation for its being made official. The "Mudar" leaves and fresh plant of *Calotropis gigantea*—was the subject of a special paper (by Dr. John Morton, Mussorie) in the Indigenous Drugs section. It has vesicant properties and is being advocated as a remedy for eczema, of which some remarkable cures were recorded. It obviously requires further trial. The *Carica papaya*, or, at least, papain, has now been perhaps sufficiently long before the world to justify its claim to official recognition. The undoubted efficacy of the "Kurchi" (bark of *Holarrhena antidysenterica*) was recorded in the *Pharmaceutical Journal* some time ago by Mr. Thomas Stephenson. It is now being so much adulterated by the unscrupulous natives, that it stands in some danger of losing its reputation unless some official standard is indicated. The properties of the "gurgun" and "chaulmugra" oils, also included in the Congress recommendations, are now fairly well known. The fact that Dr. Kanny Loll Dey is preparing a new edition of his work on the 'Indigenous Drugs of India,' which is likely to embody the results of his extensive researches in this department, was recently referred to.

The other papers read in the Indigenous Drugs section were not productive of any very new facts in *materia medica*. The popular belief in the high antipyretic value of quinine was questioned by Surgeon-General Sir William Moore. In another paper by Surgeon Lieut.-Colonel F. V. Jenson, the hypodermic treatment of malaria was advocated in doses of half a grain of the neutral sulphate dissolved in water. Permanganate of potash solution was recommended in another communication as an effective preventive of danger from bites of rabid animals, the deaths from which number in India 80 or 90 per cent. of those bitten. The Eastern panacea, "Vapor Opium," was held by Dr. Camá of Bombay as worthy of adoption among the official vapours.

The presence and enthusiastic co-operation with the local committee of Mr. Ernest Hart, as delegate of the British Medical Association, added very

materially to the success of the Congress, and he delivered several most important addresses during his sojourn in Calcutta. In the course of an exhaustive review of the position of the medical profession in India, he laid great stress on the importance of scientific and practical work in bacteriology and micro-pathology. He revealed the fact that the great majority of the 10,000 medical men of India were about ten years behind the times in this respect. He advocated the establishment of research laboratories and the prosecution of preventive medicine and improved sanitation, and his recommendations have been submitted to the Government of India by influential sponsors. It was significant that the leaders of the Congress were inclined to favour such advanced medical conceptions as the antitoxin treatment of diphtheria, anti-choleraic inoculations, and the Pasteur system generally.

In the section of Medico-legal Medicine the Chemical Examiners to the Government for Bengal made a strong representation, which will be transmitted to Government, urging the necessity for restriction in the sale of poisons in India, particularly with regard to the sale of opium and arsenic. It is well known that the most dangerous poisons may be purchased with impunity in all the native bazaars.

A small but very successful

EXHIBITION

of medical and pharmaceutical specialties was held while the Congress lasted. The principal exhibitors were Messrs. Burroughs, Wellcome and Co., Messrs. Allen and Hanbury, Messrs. Smith, Stanistreet and Co., Calcutta, and the Mellin's Food Company for India, Limited. The next Indian Medical Congress will probably be held at Bombay in the "cold weather" of 1898.

Proceedings of Societies in London.

ROYAL INSTITUTION.

On Tuesday, January 29, Professor Stewart delivered his third lecture on the internal framework of plants and animals. After recapitulating the structure of *Actininosphaerium* and *Acanthometra*, he proceeded to describe a variation from the latter in which the capsule enclosing the central protoplasmic mass is provided with one aperture only, whilst numerous solid siliceous rods, often armed with spines, lend support and perform other functions, in addition to which the creature is furnished with pseudopodia. In another form a network of filaments distributed in layers through its whole substance affords efficient support; in this case swimming movements are effected by a flagellum. A number of such units sometimes aggregate to form a colony, examples of which can be found in *Sphaerocodium*. In one of these a central mass of vacuolated protoplasm is surrounded by groups of denser nucleolated protoplasm, each of which is encircled by spicules.

Under the name *Metazoa* were grouped those forms of life in which the egg-cell divides and gives rise to a number of others which fulfil different functions.

Some form a skin, some an internal lining, others again a middle layer performing the function of muscles.

Professor Stewart then proceeded to deal with the sponges, showing that between the outer layer of cells or ectoderm and inner lining or endoderm there is a middle layer or mesoderm; one of the chief constituents of which is a jelly-like substance or mesogloea. Certain of the cells of the endoderm assume a rounded instead of flattened form, and develop cilia by the action of which a current of water is drawn through the small pores and ejected through the large ones. Certain of the cells of the ectoderm appear to migrate into the mesogloea; from some of them proceed filaments which protrude between the cells of the ectoderm, the latter also sending accompanying threads. Such filaments may be regarded as a very rudimentary sensory apparatus; change in the environment is frequently followed by movements of the sponge mass, closing of the pores, etc., the impulse being apparently communicated through these projecting filaments. Other cells that have migrated into the mesogloea produce calcareous or siliceous rods.

Professor Stewart afterwards described the structure of *Grantia compressa* and explained the means by which a current of water could circulate through it, as well as the form and nature of the spicules, and the manner in which they acted as a support. Venus's flower-basket (*Euplectella*), was dealt with in a similar manner, particular attention being drawn to the means by which the spicules were cemented together.

Amongst the objects exhibited under the microscope were specimens of horny sponge (*Chalina*), siliceous sponge (*Meyerina*), spicules of *Labaria*, and *Sphaerocodium*, calcareous sponge (*Grantia compressa*), *Euplectella*, and a horny sponge (*Stannophyllum*), in which dead shells of *Radiolaria* formed part of the skeleton.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, January 24, the following paper was read:—

VOLUMETRIC AND COLORIMETRIC ANALYSIS.

BY W. H. SYMONS, F.I.C.

Sutton defines volumetric analysis as "quantitative chemical analysis by measure," and he says "it depends upon the following conditions for its successful practice:—

"1. A solution of the re-agent or test, the chemical power of which is accurately known, called the 'standard solution.'

"2. A graduated vessel from which portions of it may be accurately delivered, called the 'burette.'

"3. The decomposition produced by the test solution with any given substance must, either in itself or by an indicator, be such that its termination is unmistakable to the eye, and thereby the quantity of the substance with which it has combined accurately calculated."

I shall accept this definition and these conditions, and shall also deem it quite unnecessary to point out the advantages which volumetric methods possess over gravimetric in certain cases, for we are all convinced of the extreme accuracy, rapidity, and sim-

plicity of the operations required. Neither shall I bring forward any new methods, but I shall content myself by enlarging upon the conditions necessary for the successful practice of every-day operations, and I shall follow the order in which these have already been stated, viz., Standard Solutions, Appliances used in Volumetric Analysis, and End Reactions.

Standard solutions.—Standard solutions in the common and loose acceptance of the term are really standardised solutions, and not necessarily solutions of standard strength. Sutton in his 'Volumetric Analysis' recommends "that no attempt should be made to attain rigidly exact standard solutions, but that their strength should be accurately ascertained and the necessary factors marked upon the bottles in which they are kept. Thus he writes, "Suppose that the acid is too strong, and that 35.2 C.c. were required

instead of 35.85, $\frac{35.85}{35.2} = 1.0184$; 1.0184 is therefore the factor by which it is necessary to multiply the number of C.c. of that particular acid in order to bring it to normal strength. This plan is much better than dodging about with additions of water or acid."

"Under all circumstances it is safer to prove the strength of any standard solution by experiment, even though its constitution has been accurately weighed in the dry and pure state."

Now, personally, I prefer to use in all cases when dealing with an unalterable substance a rigidly exact standard solution; it saves so much time in calculation and is otherwise much more satisfactory, and I fall to see any necessity for dodging about. What can be easier, for example, in the case quoted than to make 1000 C.c. of the solution up to 1018.4 C.c. with water and so make the solution strictly comparable with any other of normal strength? These measurements can with care be done to 0.05 C.c., and hence the error with two measurements need not exceed 1 in 10,000. I am going to try to demonstrate this to you by mixing a litre of normal acid with a litre of normal alkali, and, adding methyl-orange, seeing how much of a deci-normal solution is required to restore neutrality. Now these solutions were not made as laboratory experiments but for every-day work in a factory. I should make no special virtue of this if I did not know that in many cases chemists were satisfied with a much lower standard, and that solutions are sometimes sold as standard solutions which vary as much as 1 per cent. from normal. I may be asked what is the use of making solutions to agree so nearly one to the other when perhaps the absolute value of either cannot be ascertained with anything like the same degree of accuracy, and when even an error of one per thousand may be usually disregarded?

I reply that errors easily become multiple. Thus, in determining ammonium carbonate, two errors in weighing and four in titrating, if all the same way, might mean an error of 0.5 per cent., or, if the 1 per cent. standard were adopted, of no less than 5 per cent. The knowledge that in titrating one solution with another no appreciable error is introduced by variance of the solutions is worth far more than the little care it takes to measure accurately and adjust in

the first instance. The secret of success really consists in measuring quantities of liquid accurately by using narrow-necked flasks and pipettes for measuring in place of the official cylinder, and in working on fairly large volumes of liquid when titrating. We get the same error in measuring 5 C.c. as in measuring 50 C.c., being open to an error of 0.1 C.c. in reading the burette; this alone in the former case means no less than 2 per cent., whereas in the latter case it is only 0.2 per cent.

Furthermore, I do not think that much good is done in attempting to standardise the solution of any substance which can be obtained in a dry and pure state, for example, silver nitrate. It is difficult to imagine any substance purer than pure silver nitrate, and in making its volumetric solution all that is necessary is to weigh and measure accurately.

I shall this evening frequently use the word normal as indicating the strength of a solution; one would think that with a word in such common use there could be no ambiguity, but, unfortunately, in pharmaceutical circles such ambiguity does exist. Sutton is very clear, and says "Normal solutions as originally devised are prepared so that one litre at 16° C. shall contain the hydrogen equivalent of the active re-agent weighed in grammes (H=1)," and as far as my experience goes, it is in this sense that the word normal, as regards volumetric solutions, is commonly applied, but on turning to 'Atfield's Chemistry,' we find "Normal solutions contain one molecular weight of substance in grammes per litre," and no mention is made of any different opinion being held. Many text books contain similar teaching. This is most unfortunate. Semi-normal, quinti-normal, and deci-normal are also common terms for the weaker solutions, di-normal is used for solutions of double normal strength, and I have proposed the terms penta-normal and deka-normal for stronger solutions which serve as common re-agents. I find it a great advantage to keep solutions of equivalent values rather than on the percentage system.

Appliances used in volumetric analysis. Most important among these are measures, and here we are at once met with a difficulty as to what we mean by a cubic centimetre. Do we mean the volume of a gramme of water at its greatest density, or do we mean something else?

Fresenius advocates the use of the true cubic centimetre. Mohr takes the C.c. as the volume of a gramme of water at 17° 5, which makes his litre flask hold 1.2 C.c. more than the strict litre. Sutton advises the use as the C.c. of the volume of one gramme of water weighed at 16° C. really 0.999 C.c., his reasons being the difficulty of reducing the temperature to 4° C. and the number of wrongly graduated instruments in use.

I prefer to use the strict cubic centimetre and do not see the necessity of cooling to 4° C. if we know the specific gravity of the water at the temperature at which we weigh, and this has been accurately determined by Despretz and others.

A cubic centimetre of water at 16° C. (60.8°F.) weighs 0.99898 gramme, and at 15° C. (59°F.), which in

many books on physics is taken as the standard temperature, 0.999125 grammes.

For everyday purposes the P.B. temperature, $15^{\circ}5\text{ C.}$ ($59^{\circ}9\text{ F.}$), may be taken, and the specific gravity of water as 999.05. If it is wished to standardise a flask, it should be weighed when quite dry, then 999.05 grammes of water introduced, taking care not to wet the upper part of the neck of the flask. When the temperature has been adjusted to $15^{\circ}5\text{ C.}$, this weight of water will be exactly one litre, and the mark opposite the bottom of the meniscus of the liquid will be the fiducial mark. The flask should then be emptied, drained for thirty seconds, and again weighed. This will give the weight of the residuum and enable us to calculate the mark on the neck, to which it will be necessary to fill the flask when it is required to deliver one litre.

The result of six weighings by Mr. Stephens and myself will show what accuracy may be expected:—0.90, 0.98, 0.85, 0.92, 0.83, 0.89, giving as a mean 0.9 and a variation of less than 0.10 C.c. Of course the residuum will vary with every liquid. Thus with strong hydrochloric acid Mr. Stephens obtained a mean 1.10 C.c. The liter flask should have, in addition to the supposed fiducial mark, graduations above and below in terms of 0.10 C.c.; these may conveniently extend down to 998 and up to 1010 C.c. or more, and will be found extremely useful in many ways. I have had my flasks pipettes, and specific gravity bottles so marked with millimetre divisions for the last fifteen years.

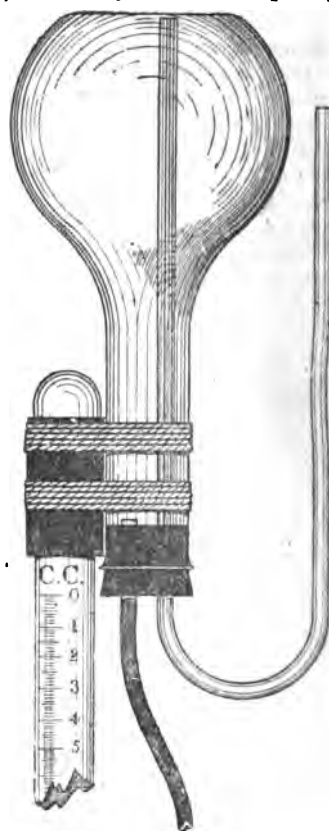
Pipettes are the most accurate form of measures of capacity. They are bulb and graduated to deliver or contain fixed volumes, or they are cylindrical and graduated to deliver various volumes at the discretion of the operator. The former if used as containing so much, *i.e.*, if rinsed out with the solution of the substance, then filled up to the fiducial mark with the solution of known temperature, and washed out with distilled water, the washings being added to the solution, are instruments of extreme precision and rival the balance in accuracy. If used to deliver certain quantities they are not quite so accurate, and their shape becomes a matter of some importance. They must always be emptied in the same way and drained for a definite time. It is a good plan to allow them to drain for half a minute, holding the bulb in the closed hand, and finally touching the sides of the vessel with the delivery point, but not blowing the residual liquid from them. That form made with a tube of some length below the bulb are convenient for taking liquids from bottles, but do not deliver so well.

We are now able to obtain burettes and pipettes guaranteed as "normal" by the German Physical Society. I have carefully examined one of these burettes and can find no error in it. Mr. Stephens has also thoroughly tested a complete set of "normal pipettes," varying in capacity from 2 C.c. to 100 C.c., and in no case was any error found. Any one who has been in the habit of standardising the instruments as purchased will know what an immense improvement this is.

Floats.—There can be no doubt that the use of proper floats increases the accuracy of reading the quantity of fluid delivered by a burette, and Fresenius

says that by their use we may read to 0.02 C.c. This may be possible to an expert, but I am persuaded that, as commonly used, floats are a source of error rather than an aid to accuracy. They are usually much too large for the burette. Several other devices are in common use, such as a thick straight line behind the burette, but these devices are accessories, the value of which one must personally determine for oneself. The limit of accuracy being the size of the drop of the liquid, I think it is far better to trust to reading from the bottom of the meniscus, taking care when exact results are needed to use so much substance that nearly a buretteful of volumetric solution will be needed to bring about the end reaction.

Store Bottles for Volumetric Solutions.—Where a large number of analyses have to be made, nothing can be more satisfactory than the time-honoured aspirator; when analyses are less frequently but regu-



STORE BOTTLE— $1/4$ ACTUAL SIZE.

larly called for, then a store bottle, forming the foot of the burette stand, from which the solution may be blown into the burette is extremely useful, whereas, for a single series of analyses an ordinary wash bottle about 150 C.c. capacity may be filled with the solution which may be blown into the burette, or the bottle being attached to a strong test tube, may be placed above the burette as shown in the illustration, the T-piece and two taps being as usual.

Jena Glass.—Germany has conferred another great boon on the world by giving us a nearly insoluble glass.

Its more general introduction is likely to mark a distinct epoch in water analysis. Water standing for a few days in ordinary blue-stoppered Winchesters becomes contaminated with silica to a notable amount, and as the difference of a few tenths of a grain of silica per gallon may have considerable influence on the action of the water on lead, this matter is of great importance. The analytical data as to the amount of silica in many natural waters will probably need correction. For so far waters for analysis have invariably been collected in vessels capable of yielding from one to two grains per gallon of soluble substance, and re-agents have also been stored in vessels of similar material. In quite the early days of chemistry this was recognised, and glass vessels were discarded in prolonged operations, and especially where water had to be concentrated.

Jena glass does not yield a tenth of a grain of solid substance to a gallon of distilled water, even when this is evaporated to a small bulk in the vessel. Jena glass flasks are therefore very useful for evaporating large volumes of water, and Jena glass tubes for condensing distilled water.

I have asked the makers to supply me with stoppered flasks, or Winchesters, so that waters for analysis may be collected in them, but although I made the request early last year, I have been unable to obtain them from Germany; Messrs. Gallenkamp and Co., however, have been kind enough to have those on the table specially ground for me in England.

(To be continued.)

Provincial Transactions.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

ADDRESS BY MR. MICHAEL CARTEIGHE.

A meeting of the members of the Manchester Pharmaceutical Association was held on Wednesday week at the Albert Memorial Hall, Manchester, to hear an address from Mr. M. Carteighe, President of the Pharmaceutical Society of Great Britain. There was a large attendance. Mr. G. S. Woolley, President of the Manchester Society, was in the chair, and with him on the platform, besides Mr. Carteighe, were Messrs. G. S. Westmacott, W. Bowden, F. B. Bengier, J. R. Young, W. Wilkinson, W. Kirkby, A. J. Pidd, and H. Kemp (Secretary).

THE CHAIRMAN, opening the proceedings, said the Council of the Manchester Pharmaceutical Association could not allow the opportunity afforded by the visit of the President of the Pharmaceutical Society of Great Britain to Manchester to pass without inviting him to meet the members, in order that they might hear from him words of advice and encouragement. The Council was quite alive to the importance of availing themselves of every opportunity of enabling the members to make the personal acquaintance of their leaders, and of those leaders there was none more capable and fitted to speak to them on trade politics than Mr. Carteighe. No leader had devoted a larger

share of the best years of his life to the furtherance of their interests. Since Mr. Carteighe last addressed them in Manchester, Mr. Woolley continued, he had noticed an increased amount of interest taken by the members of the district in pharmaceutical politics, and he was not without hope that the remarks of that day would tend to increase the interest. Mr. Carteighe had promised to speak on the things that it was possible to attain in the way of pharmacy legislation, and might refer to the way in which the Manchester district could assist the efforts being made to improve the legislation which governed their trade.

MR. CARTEIGHE said it was a special privilege to be allowed to address a Manchester audience once more. He remembered that, as a result of some observations which he made in Manchester three or four years ago, and of the discussion that ensued, several men who had felt themselves antagonistic to the Pharmaceutical Society had joined it and become useful members. He was glad to hear of the increased activity locally. Obviously it was one of his duties, as President, to bring himself and the Council as much as possible in touch with every part of the country. The Pharmaceutical Society was not a London association. It was a corporate body representing Great Britain in its entirety, and there should be an endeavour, as far as practicable, to unite the wishes of those in the north with those in the south.

Coming to a consideration of the questions, "What it is we want?" or "What do we think we want?" he thought they must all feel, having regard to their education and training (though some of them thought that was not so effectual as it should be), that they were entitled to ask, and he thought the public was entitled to ask, that the compounding of prescriptions, and not simply the compounding of poisons, should be left in the hands of registered chemists and druggists. There were some who thought that the sale of all preparations compounded in the pharmacy should be so limited, and he was distinctly of that opinion himself. But he could not help feeling that in this free trade country, where legislation was much more difficult to accomplish than it was in a new country, or even in Ireland, it was desirable that they should proceed step by step instead of trying to get to the top of the ladder all at once by means of a rope. The chances were that if they were too precipitate they would lose some of the privileges they already possessed. The Council had been obliged to carry out the Act of Parliament during the last few years in a manner which some persons—not on the Register of Chemists and Druggists—considered rather drastic. The Council had to take many proceedings at law, and the meeting would readily understand that a certain section of the community, whether called the grocer section or the huckster section, would not be particularly anxious to increase the powers of pharmacists.

They would have to consider how far they could overcome the opposition of those who, like themselves, had votes and influence in the House of Commons. In Ireland, the compounding of prescriptions was restricted to registered men, and it was fair and reason

able to ask Parliament to make a 'similar restriction in Great Britain. He believed this would have been granted years ago if it had not been for the unfortunate differences that existed between the Pharmaceutical Society on the one hand and those not connected with that body. Originally, the Pharmaceutical Society never intended to go to Parliament for a Poisons Bill. Its intention was to go for the restriction of the compounding of medicines, and it was want of sympathy very largely, and differences of opinion upon what were, after all, minor matters, that prevented the draft Bill of 1866 being carried into law. All they could do in the future was to amend the Act they had on safe lines. Whatever their condition was in 1868, they could claim now that they had in every district a class of men fully competent to dispense every prescription that any medical man could write. He had grave doubts whether in 1868 that was the case. In outlying parts of the country, where dispensing was done by general practitioners, very many chemists had not had much experience in dispensing at that time. Now they had a special claim on the Legislature, inasmuch as the Society had created a class of young educated men, spread throughout the country, who were ready at a moment's notice, when doctors would give up dispensing, to do it—should he say as well—perhaps he ought to say much better than the doctors did it themselves.

The question of company trading had not been lost sight of, and could not, of course, be overlooked. They must remember that the judges had held that a corporation was not a person, and that corporations were not provided for in the Pharmacy Act, and were not within it. As President he had to make himself more or less disagreeable by pointing out that this judgment was due to the fact that in the Pharmacy Act they had inserted a special clause, which differed in principle from every other part of the Act. It began by asserting the necessity—for the safety of the public—that every person who dispensed poisons, etc., should be qualified and registered, and then immediately set to work to undo that by saying that in the event of the death of a registered person, the qualification which was vested in his person should pass to executors, or his widow and children, providing a registered assistant was kept. The insertion of that clause was a grave mistake. He and another member of the Council tried to exclude it from the draft Bill, but were unsuccessful. The Bill created on the one hand a sort of statutory professional title, which was to be purely personal in its character, and, on the other hand, tacked on to it something which simply applied to the conduct of a mere business which went like machinery. If chemists and druggists really believed that it was right and proper that their widows, administrators, or executors should have power to carry on business in the way now provided, it was hopeless and illogical to ask any Legislature to deal with company trading. At the time of the passing of the Act it was said that time must be allowed for the estate of a deceased chemist and druggist to be wound up, and that,

during the short period allowed, the danger to the public would be limited to a year, or a few months at the outside. Trusts went on for very long times, and it was possible to obtain all the personal privileges conferred upon them individually by the Pharmacy Act of 1868, as readily through the executors' clause as by the provisions of the Companies Acts. The position of chemists and druggists would be assailable always as long as that clause remained. He was not prepared to say that even if the company question had not been settled in the way it was, means would not have been found, through the executors' clause, of carrying on the business of chemists and druggists by registered persons. There never was a law through which a coach and four could not be passed. It was true there was one considerable difference between the position of a company and the position of executors. The Council of the Pharmaceutical Society could sue the latter if they did not keep a registered assistant, but could not sue a company. What the Council had to do, therefore, was to sue any unregistered person in the employ of a company who actually handed over poisons. It had been very successful in many cases where a man who owned nearly all the shares was carrying on the business; it had recovered several penalties, and produced a salutary effect. It would be open to the members of the Society to say whether they thought companies should be made liable for the acts of their assistants, and whether they would do anything that would tend to legalise company trading so long as the company employed registered persons. Hitherto the Council had refrained from doing anything in that direction. After further arguments on the same subject, Mr. Carteighe stated that the loophole given to companies by the executors' clause was a difficulty which must be faced before the Council could draft any clause dealing with the companies.

He next spoke of the question of erasing from the Register the names of persons who had been guilty of offences, stating that it was very important that the Council of the Pharmaceutical Society—of course, with the approval of the Privy Council—should have this power. He was not suggesting a code of ethics, because under present conditions, and taking into account the battle everyone—principal and assistant—had to engage in to earn his bread and butter, it would be an extremely improper and dangerous thing to have powers of that kind. He did not suggest that a man who had been employed at a store or by a company should be struck off on that account. He would like co-operation among them all to bring them all to a higher state without the pressure of the law. But when a man had committed a misdemeanour he should be erased from the Register, as lawyers and doctors were erased from their registers, or they could not, as a body, claim from the public that consideration and respect which they had a right to demand. A person struck off, however, should have the right of appeal for reinstatement after a certain number of years.

With regard to educational matters and examination matters, he should like to see—and he thought hi

Brethren in the trade were beginning to realise its necessity—a preliminary examination imposed upon all who wanted to enter their craft, the examination to take place when the candidates were 16 or 17 years of age. Then they wanted what had been recently obtained in Barbados, the provision of an intermediate examination not less than a year after the preliminary, and a final examination when the pupil became 21. He considered also that three years' service of some kind, using the word service under the old conditions, was part of a proper training, courses of instruction—which an employer could not give—going on at the same time. Under this system there was an advantage to those who were already in the trade. They did not reject the competent; the incompetent they did not want. Some of the candidates who came before examiners were nearly 40. They never passed, and how did they earn their living? By poaching upon the craft into which they could not legally enter. If they gave their young men a proper and a distinct course of training, he hoped and believed that 95 per cent. of them would pass, instead of about 40 per cent. When that could be done, every chemist and druggist in business would be a financial gainer. To encourage a lad who had been picked up in the street, taken into a pharmacy, and engaged as bottle-washer for three or four years, to try and get into an occupation for which his education did not fit him was not only bad for the trade, but a delusion to the lad. An uneducated person who by a fluke succeeded in passing the examination could not succeed in business in these days.

He confessed he was one of those who believed, when the Pharmacy Act was passing through Parliament, that most of the young men would go in for the higher qualification—would equip themselves for the Major examination. He regretted to say that he had been grievously disappointed. All over the country, and especially in Scotland, which was supposed to be a specially educated place, a relatively small number of men went in for the higher examination. He could assure all those young persons who might read his observations, that, in his belief, just as it paid to be trained for the Minor examination, so it would pay to be trained for the Major, but the Council of the Pharmaceutical Society could not compel students to enter for the Major examination, and it did not wish to use compulsion.

It remained for the Council to deal with that class of men who might be said to be the backbone of any business or profession—the men who were not specially learned, but who were learned enough to ensure the safety of the public, and many of them better men than some pharmaceutical chemists in certain respects. Those men were asked to join the body politic, and they were asked, in the exercise of their voting powers, to have some sympathy, and—if even there should be a divergence of opinion between the pharmaceutical chemist members and the chemist and druggist members—to leave something for the sake of "Auld Lang Syne" for the former. This change having

come about it must be faced and dealt with. The Council of the Society was quite willing to go to Parliament for a short Bill, with the hope that it would be non-contentious, for the purpose of altering the constitution of the Council and making more chemist and druggist members eligible for election thereto.

Proceeding, Mr. Carteighe said the title of his observations was "The Possibilities of Legislation." He had mentioned at considerable length the legislative wants of chemists and druggists, but it might be said to him, "You have not been able to point out all the remedies. You have not been able to tell us how we are going to get all these wrongs redressed." He confessed that he had not. Until the President of the Pharmaceutical Society had at his back a majority of the chemists of the country, until he and his colleagues could go to the House of Commons with that statement, he had grave doubts whether they would get anything. If, therefore, they meant business in Manchester and elsewhere, they should begin at once to consider that point and to rally round the Pharmaceutical Society. Let them not criticise what was done in the past, many of them did not know the reasons why certain things were done. He could talk for a week giving very good reasons for many things that must appear somewhat absurd. They had to deal with the subjects of to-day, and if they were to succeed, the Society must have all or a great majority throughout the country at its back. More than that, chemists must begin to do as other bodies did; they must consider the interests of their craft in connection with the great political interests of the country. They ran a risk of being squeezed out entirely if they did not make some terms with their representatives. He had tried to dissuade himself from the notion, but he was not quite sure that they would not be driven, by the force of circumstances, to consider at the election of every member of Parliament, in every constituency, the question how far those candidates should be questioned in regard to matters pharmaceutical. Members of Parliament wanted educating, and governments required educating. Since he was a boy they had been dealing with measures, some of them, no doubt, of extreme importance, and not a few of them—if he might say so, with all respect to their august chiefs—not a few of them largely sentimental.

As for domestic legislation in its widest sense—legislation affecting the great masses of the people—governments had not done a single thing, except when the classes had driven them to do it. Therefore they should consider whether they should not adopt, at the next general election, in a proper and a deferential way, some sort of proceeding which would serve as an object lesson to all the candidates. Candidates should be shown that there was a class of men throughout the country, fairly well educated and some of them influential, who were called chemists and druggists, and that they had a claim to consideration at one time or another. Personally, he should make it very uncomfortable for one candidate who had obstructed them, unless, when he had been educated—and his education should not take more than five minutes—he came

to a right frame of mind. The Pharmaceutical Society was powerful for defence; it would undertake to stop measures that would do them harm, but was hardly inclusive enough or influential enough to put pressure on governments to take up its measures, and never would be until the Council had the great majority of the trade at its back working in one direction. He did hope that what he had said might be the means of stirring some enthusiasm among those who had not hitherto considered it a part of their life to consider these matters. Chemists and druggists were a product of true technical education which everybody was concerned in now, and there was no better time to talk to members of Parliament of the desirableness of certain privileges being given to a class of technically educated men, not wholly for their own personal gain, though that must be considered, but because such a policy would conduce to the welfare and the safety of the community.

The CHAIRMAN proposed, "That the Pharmaceutical Society is deserving of the support of the trade in its efforts to carry out the existing laws and to promote further legislation." He remarked that so long as it could be said that only one-fourth of the members of the trade belonged to the Society so long they had a very difficult question to answer. As regarded enrolling chemists and druggists who had commenced business since the passing of the Act of 1868 as members of the Pharmaceutical Society, he for one would be strongly in favour of the passing of an Act that would confer that privilege on the trade, and he should be strongly in favour of allowing the trade to elect any proportion of such members that they thought fit on the Council of the Society. The "Widows' Clause," in his opinion, had been largely instrumental in making poor widows. When consulted he had always advised widows to sell their business, and when this advice had been disregarded it had ended in disaster nine times out of ten.

Mr. TAYLOR (Bolton) seconded the motion. It was a surprise to him, he said, not that so few young men went in for the Major examination, but that so many did so. All the privileges of the trade were granted to those who passed the Minor examination, and why then should they submit themselves to a further examination? As to the "Widows' Clause," one of the leading trade journals had said that the majority of chemists and druggists were in favour of maintaining that clause, but he disagreed with that opinion, and he was strengthened in his disagreement by an editorial admission that most of the letters which that journal received were in favour of abolition. He would be bound to say there were not ten widows and executors carrying on businesses in Lancashire, and there was no doubt that the best thing a widow could do, in the majority of cases, was to sell the business as quickly as she could. As regarded company trading, he should never be satisfied until the Council had introduced a Bill aimed directly at this method of business. Such a Bill simple justice demanded. The law said, "No man shall be allowed to carry on the business of a chemist and druggist unless he is regis-

tered," and then it said that seven men, banded together, could become chemists and druggists. The only way to arouse public opinion on the question was by an Act of Parliament, and he agreed that it was of little use striving for anything unless the trade could present a united front.

Mr. H. KEMP, speaking in support of the motion, said they ought to strive for the exclusive right of compounding medicines as well as compounding poisons. The public health was as much endangered by the unskilful dispensing of medicines, non-poisonous in the ordinary sense of the word, as by the dispensing of poisons. The public needed more protection from the incompetent dispenser. He quite agreed with the president that the "Widows' Clause" should be removed or remedied. He did not say for one minute that a man's establishment should be closed the day he died. A reasonable limit—two or three months or more—should be put upon the time during which a business could be carried on by executors. And the Council should have power to extend the time where they thought it desirable. He also believed that it was disastrous in most cases for a widow to carry on business, but to force a sale immediately after a man's decease was a very much greater disaster. At the same time, he could not accept Mr. Taylor's estimate of the number of widows and executors who carried on business in Lancashire. He knew more than ten in Manchester alone. One reform which he should like to see was compulsory notification of changes of address of chemists and druggists who were on the Register. That matter should not be left to Local Secretaries. Under the present system, men who were dead or who had removed to other parts of the world might be allowed to remain on the Register for ten, twelve, or fifteen years, and that led to deception, and to trouble in the identification of those who were covering or assisting to cover bogus companies. He knew a man on the Register who gave as his address the address of a bogus company which he was covering, and never mentioned the address at which he really carried on business on his own account. Concluding, Mr. Kemp said the Pharmaceutical Society was deserving of much more support than it secured. They wanted all chemists and druggists to join, not only because they paid a humble subscription, but because their moral support was valuable.

Mr. SAUNDERS said it seemed singular to him that chemists and druggists should have to submit to all this legislation in reference to the dispensing of poisons. The system made fish of one and flesh of another. Why should medical men be exempt from provisions by which chemists and druggists were bound, hampered, fastened and tied as if they were children? Much more poisonous matter came out of surgeries every day than came out of chemists' shops, and it was only regulated by rule of thumb. He knew the trade before the Pharmacy Act was passed, and it was five times as good then as it was now. The Act had been the ruination of the trade. What did chemists want with regulations when medical men were free?

Mr. CARTEIGHE said it was true that a medical man could dispense any medicine he chose in his private establishment, but he was liable under some of the provisions of the Act. It was also true that a medical man could not be compelled to keep a registered person to dispense his medicines, and he had heard that in many surgeries the dispensing was not as it should be. He would remind Mr. Saunders that the Act was passed to provide that persons keeping open shop for the sale of certain things should be registered. When a doctor kept open shop, the conditions under which that doctor had to carry out his selling and dispensing were precisely the same as the conditions under which the registered chemist and druggist carried on business. They might think it undesirable that medical men should dispense their own prescriptions, but it was not the best way to get that branch of dispensing into their hands to abuse many men who were quite as hard-worked as they were themselves.

The resolution was carried with but two dissentients.

Mr. KIRKBY proposed "That this meeting, while acknowledging the efforts of the Council to consolidate the Pharmaceutical Society, thinks that end will be greatly furthered by the removal of the limit as to the number of chemist and druggist members upon the Council."

Mr. J. R. YOUNG (Warrington) seconded the motion, which was supported by Mr. Phillips and carried unanimously.

The thanks of the meeting were voted to Mr. Carteighe on the motion of Mr. Kemp, seconded by Mr. Wilkinson, and the proceedings then ended.

BRISTOL PHARMACEUTICAL ASSOCIATION.

The annual meeting of this Association was held on January 21 at University College, Mr. Berry (President) in the chair.

The HONORARY SECRETARY (Mr. Keen) read the report of the Council for the year 1894 as follows:—The number of members constituting the Association continues nearly the same as it has been for the last five years; and the property of the Association, that is its library and its collection of materia medica, is now housed and cared for in the buildings of the College. A general desire having been expressed for the promotion of some systematic teaching in the subjects of materia medica and pharmacy, in addition to those of chemistry and botany, which are well provided at University College, the matter was carefully discussed by the Council, and it was finally determined to accept a very kind offer on the part of Mr. Keen, pharmaceutical chemist, to make the experiment for one session of holding a weekly class for "Readings and Illustrations of the Pharmacy and Materia Medica of the Pharmacopœia." A fee of 7s. 6d. was to be required from each student towards the expenses of the course, but Mr. Keen declined to receive any remuneration for his work. Arrangements were fortunately made with the Council of University College, who very kindly allowed the use of a room for those meetings, and Messrs. White and Towerzey (Giles, Schacht and Co.) had been good enough to allow the class to meet occasionally in their laboratory and

witness processes of pharmaceutical interest. The experiment has been distinctly successful, and the students attending were showing satisfactory appreciation of what was offered them. The demand for the books of the Library continued to be fairly good; a few of the books had had to be re-bound, and the collection of materia medica was being turned to good account by Mr. Keen.

The statement of accounts submitted by the Treasurer (Mr. Stroud) showed a balance in hand of £9 14s.

The CHAIRMAN, in submitting the proposition, "that the report and statement of accounts be received and adopted," referred to the satisfaction all present must have felt at hearing that Mr. Keen's kind and generous offer was being so well appreciated. He had long hoped for a complete School of Pharmacy in Bristol where apprentices and assistants might qualify themselves in full for the examination room without the intermediate London crammer, and he still continued to indulge that hope. Perhaps, however, the obtaining of a compulsory curriculum was a first step, then a well-organised scheme of instruction would become a comparatively easy matter, but that time had not yet come. In the meanwhile they felt very grateful to Mr. Keen for so kindly volunteering to fill that most conspicuous void. Young pharmacists could get very good systematic teaching in both chemistry and botany at the courses of lectures at the University College, and elsewhere, but in mat. med. and pharmacy there was no teaching to be had except at the Medical School, and that was scarcely of the kind pharmacists required, therefore Mr. Keen's offer was of great value, and he hoped sincerely that the experiment, as he termed his labours, would be thoroughly satisfactory and lead to something perhaps still more complete. He thought that upon the whole the Association was doing some good work, though undoubtedly with a little more enthusiasm they might do better.

The proposition of the Chairman was seconded by Mr. Chandler and carried. The new Council was then elected, and the officers appointed Mr. Allen, President; Mr. Stroud, Vice-President and Treasurer; Mr. Keen, Hon. Sec.; Messrs. Berry Chandler, Pitchfold, Plumley, Richards, Sechacht Towerzey, Warren, and White.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting on January 24, Mr. John Foster, vice-president in the chair, a most pleasant and profitable night was passed with Mr. J. Rutherford Hill, who brought with him an interesting collection of specimens, mostly related to the vegetable kingdom and materia medica, which he gave short accounts of.

Cinnamomum zeylanicum.—A branch with leaves, grown in the Botanic Gardens at Edinburgh, showed the tri-costate veined leaf. The cinnamon gardens at Colombo were described as being arranged like an oak coppice, as seen in parts of England and Scotland, and the manner in which the quills

of commerce were obtained was also described.

Asafoetida.—A sample of essential oil obtained as a bye-product in straining crude asafoetida. 6 to 9 per cent. is obtained of the oil, which is a mixture of sulphide and bi-sulphide of allyl in varying proportions.

Cocaine benzoate, crystallised from a strong aqueous solution at a few degrees below normal temperature. The crystals were in very large, fine acicular needles. From Messrs. Duncan, Flockhart and Co.

A glass pestle was shown which had exploded spontaneously. It had been in use many years, was last used in dissolving ammonium carbonate, cleaned, dried, and set aside. The fragments presented a curious structure like crystals radiating from a centre. The core of the pestle was fractured so as to resemble a series of minute cones arranged in a spiral. It was suggested that molecular tension between the inner and outer parts of the glass had existed, and the outer portion being worn away a molecular disturbance occurred resulting in disruption, as in the case of a Rupert's drop.

Chinese Oil of Peppermint.—Three small phials holding about half a fluid drachm, put up in small oblong cardboard boxes with Chinese label attached. Bought in a Rangoon bazaar for about 1½d. each.

Dryobalanops aromatica from Jahore.—A piece of the wood showing particles of camphor *in situ* in longitudinal interstices of the stem, crude camphor, and the pure product were also shown. Borneo camphor is stated not to volatilise at ordinary temperature, and to sink in water. The specimen showed crystals on the shoulders of each bottle, and of three pieces put in water one sunk, which, however, after a while was found floating on the top. Mr. Hill said it was an exceptional case to find a piece sink.

Acacia Gum.—Three good samples sent by Messrs. Brignardello, of Genoa. They resembled the finest varieties of Egyptian gum, now not commonly met with, and were valued at 186s., 110s., and 81s. per cwt. respectively. Lithographers said that substitutes for acacia gum had an injurious effect on lithographic stones, blurring the fine lines in delicate work, as they seemed to contain an acid which destroyed the stone, making it what they called "rotten."

Salicylic acid physiologically pure, made by Schering, of Berlin, and bearing certificate of Professor Charteris. The B. P. standard would be raised in the revised Pharmacopœia, as carbolic acid would have a higher degree of purity.

Chinese wax obtained from the twigs of *Ligustrum lucidum*, but whether deposited by an insect, *Coccothraupis*, or exuded from punctures made by it, was not rightly known.

Indian Blistering Fly (*Mylabris phalerata* and *M. cichorii*).—Large black, yellow-winged beetles, which yield about one-third more cantharidin than the Spanish fly.

Scammonium.—It had been attacked by a small reddish beetle, and was completely honeycombed. It contained much starchy matter, which had probably attracted the beetle.

Azalia ouangensis.—A large brown pod of a leguminous tree of South Africa. It contained a number of black beans about an inch long, surrounded for a third of their surface by a brilliant red arillus.

Stick Lac.—A twig deeply incrustated with the resinous secretion produced as a result of irritation caused by punctures of the insect *Coccothraupis*. Mr. Hill described the collection and production of lac dye and shellac.

Guarana.—A cylindrical piece showing how the crushed seeds are put up by the South American Indians known as guaranis.

Pilocarpus micophyllus, gurgun gbalsam, and a specimen of mannite, extracted from dandelion roots grown in East Princes Street Gardens, Edinburgh, given by the late Mr. Thomas Smith, founder of the firm of T. & H. Smith. Orpiment, a fine crystalline mass, sent from Persia, and several other specimens were exhibited and described.

Afterwards several questions were addressed to Mr. Hill in relation to the exhibits, chiefly as to the value of the asafoetida oil as a therapeutic agent, and a hearty vote of thanks was accorded.

A committee was appointed to draw up suggestions for the Revised Pharmacopœia, consisting of Messrs. Boyd, Dunlop, and Laing. A circular was received from the Faculty of Physicians of Glasgow asking for suggestions on the following points:—

1st. The drugs or preparations which might with advantage be omitted from the Pharmacopœia.

2nd. New drugs or new preparations of old drugs which ought to be introduced.

3rd. Generally, any other alterations thought desirable in reference to the revised Pharmacopœia.

The matter was remitted. The annual supper was fixed for Thursday, February 28, and business concluded.

Notices to Contributors.

* * Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

Advertisements must be sent to Street Bros., 5, Serle Street, Lincoln's Inn, W.C., where copies of the Journal may be purchased, and instructions from Members respecting the transmission of the Journal to the Secretary—Mr. Richard Bremridge—17, Bloomsbury Square, W.C.; otherwise delay may be caused.

COMMUNICATIONS received from Messrs. Balmforth, Bottle, Browne, Coull, Dott, Hill, Johnson, Keen, Kellogg, Mair, Muller, Mumbray, Pollard, Powell, Proctor, Thompson, Rideal, Robinson, Shapley, Stainer, Symons, Tallis, Warrell, Wheelton.

[The publication of several communications is unavoidably deferred until later.]

DISCOVERY OF THE COMPOSITION OF THE ATMOSPHERE.

EARLY OPINIONS AND INVESTIGATIONS.

Air was regarded by the ancients as one of the so-called elements or primitive principles, but the term implied the qualities of wetness and heat rather than any material substance, since all matter was then supposed to be of one kind, and the variety observed in Nature was attributed to the greater or less proportion in which the properties of dryness, coldness, wetness, and heat were present. At a later period, however, this conception became more and more materialised, until at length air, earth, fire, and water came to be considered as substances which entered into the composition of all other bodies, and could not by any known method be decomposed into simpler substances. This idea prevailed until the latter part of the eighteenth century, though it had by that time become considerably modified, lack of exact knowledge alone preventing the formation of truer conceptions. Thus, Macquer states that the four substances, "although reputed simple, may possibly not be so, and may even result from the union of several other more simple substances; but as experience teaches us nothing on this subject, we may, without inconvenience, and we ought to consider, in chemistry, fire, air, water, and earth as simple bodies, because they really act as such in all chemical operations."

Robert Boyle, in 1661, had denied that it was then possible to state the exact number of the elements, which he defined as bodies not capable of further separation, but from which the compounds yielding them could be again prepared. A step in advance was taken by Hooke, in 1665, who noted the similarity in the action of air and nitre, in certain cases, and suggested that combustion is probably effected by that constituent of the air which also exists in nitre. Hooke's results were confirmed and amplified by John Mayow, who, in 1669, published a paper in which it was clearly demonstrated that he had recognised the heterogeneous nature of air. He concluded that it consisted of a body heavier than air, which supported life and combustion, combined with a substance that did not possess those properties. A considerable time now elapsed before further definite information was forthcoming, as it was not until 1772 that Dr. Rutherford removed from a closed volume of air, in which animals had breathed, the fixed air formed, and proved that the residual air (nitro-

gen) extinguished a burning candle, and would not support life. About the same time Priestley obtained a similar result by burning carbon in a closed bell-jar, and absorbing the fixed air by milk of lime. The "phlogisticated air" remaining, however, was not considered by Priestley to be a constituent of the atmosphere, and it was Scheele who first definitely stated that "air must be composed of two different kinds of elastic fluids."

At the same time it is not quite clear from Scheele's writings that he recognised nitrogen as other than impure or phlogisticated oxygen or "fire-air," and the credit of identifying it as a simple body seems to belong to Lavoisier, who termed it azote (from a, privative, and $\zeta\omega\gamma$, life). Cavendish, however, in 1784, attributed the recognition of the fact that dephlogisticated air and phlogisticated air "are quite

distinct substances, and not differing only in their degree of phlogistication, and that common air is a mixture of the two," to Lavoisier and Scheele jointly. Priestley and Scheele having previously discovered and described oxygen,* and Lavoisier having confirmed their results, Cavendish was now able to make the first exact determination of the relation existing between the two constituents of the atmosphere.

HENRY CAVENDISH.

The Honourable Henry Cavendish was the son of Lord Charles Cavendish, brother of the third Duke of Devonshire. He was born at Nice on October 10, 1731, and at the age of eleven became a pupil at a private school in Hackney, where he remained until 1749, when he matriculated at Peterhouse, Cambridge.

Three years later he left the University without taking his degree, and, having been left a large fortune by an uncle, he seems to have devoted that portion of his life, concerning which information is available, entirely to scientific investigations. He gained a widespread reputation for his scientific attainments, and in 1760 he was elected a Fellow of the Royal Society, but he was always morbidly sensitive, and shrank from society, manifesting a particular aversion to women. When over seventy years old he was elected one of the eight foreign associates of the Institute of France, and he died on February 24, 1810.

Cavendish possessed exceptional clearness of comprehension and acute reasoning powers, and was an

* See papers on "The Discovery of Oxygen," pages 521 and 621 of the present volume.



HENRY CAVENDISH.

excellent mathematician, electrician, astronomer, meteorologist, geologist, and chemist. Equally learned and original, he was in the fullest sense of the term a natural philosopher. His first appearance before the public was as a writer on chemistry, but it is said that he could, with the greatest ease, change his subject of study, and constantly carry on together widely dissimilar investigations. During almost fifty years he constantly contributed to the *Philosophical Transactions* interesting and important papers, which were distinguished by the precision of the experimental demonstrations involved, as much as by the mass of scientific facts disclosed. He thus aided the progress of chemical science considerably, and from the extent and exactness of his work on gases, is generally regarded as the founder of pneumatic chemistry.

In a paper on factitious air, he gave the results of his investigation of the inflammable air (hydrogen) evolved when dilute acid acted upon zinc, tin, or iron. He determined the specific gravity of the gas, finding it to be about one-eleventh that of common air. He also ascertained the solubility of fixed air (carbon dioxide) in water, olive oil, and spirit of wine, respectively, besides showing that it rendered atmospheric air unfit to support combustion when present in the proportion of ten per cent. It was, further, shown to be identical with the gas produced by fermentation and putrefaction. His papers on the composition of water and of nitric acid deal with two of the greatest chemical discoveries on record, besides which the investigations led him to definite conclusions regarding the composition of atmospheric air. He performed much other useful work on gases, invented the eudiometer, since associated with his name, formulated a theory of electricity, and investigated several problems of importance in physics.

CAVENDISH'S EXPERIMENTS ON AIR.

In a paper read before the Royal Society on January 15, 1784, Cavendish described experiments which seemed to determine "the cause of the diminution which common air is well known to suffer by all the various ways in which it is phlogisticated, and to discover what becomes of the air thus lost or condensed; and . . . also to throw great light on the constitution and manner of production of dephlogisticated air" (oxygen). He repeated several times an experiment of Warltire's, in which, on exploding a mixture of common and inflammable air by electricity, in a closed copper or glass vessel, water was produced. The diminution in bulk of the mixed gases was carefully noted; and it was found that 423 measures of inflammable air nearly sufficed to completely phlogisticate 1000 of common air, whilst the bulk of the air remaining after the explosion constituted little more than four-fifths of the common air employed; Concerning this he remarks, "as common air cannot be reduced to a much less bulk than that by any method of phlogistication, we may safely conclude that, when they are mixed in this proportion and exploded, almost all the inflammable air, and about one-fifth part of the common air, lose their elasticity, and are condensed into the dew which lines the glass." This dew was subsequently proved to consist of pure water only

and the same product was obtained on exploding inflammable air (hydrogen) and dephlogisticated air (oxygen) together, though it was accompanied in the latter case by a small proportion of nitrous (nitric) acid. This acid, however, was shown later to be produced only when phlogisticated air (nitrogen) was present, and the dephlogisticated air was in excess of the quantity of inflammable air requisite to combine with it. When the inflammable air was in excess the whole of the dephlogisticated air naturally entered into combination with it, rather than with the phlogisticated air and, consequently, no acid was formed. It is here noted by Cavendish "that phlogisticated air appears to be nothing else than the nitrous acid united to phlogiston, for when nitre is deflagrated with charcoal, the acid is almost entirely converted into this kind of air."

THE COMPOSITION OF WATER.

The formation of the nitrous acid, he pointed out, might be explained in two ways, either by assuming that the dephlogisticated air consisted partly of nitrous acid; or that part of the phlogisticated air present was deprived of its phlogiston and converted into nitrous acid, when the dephlogisticated air was more than sufficient to consume the inflammable air. The second explanation was favoured by Cavendish, who observes that if it be true, it must then be allowed "that dephlogisticated air is in reality nothing but dephlogisticated water, or water deprived of its phlogiston," and that "inflammable air is either pure phlogiston . . . or else water united to phlogiston," the union of dephlogisticated air and phlogiston thus resulting in the formation of pure water. On the other hand, if the first explanation were the correct one it must be supposed that "dephlogisticated air consists of water united to a little nitrous acid and deprived of its phlogiston."

An "almost decisive argument" in favour of the explanation preferred was supplied by the fact that the purer the dephlogisticated air was the more acid was the water formed by the explosion, when a little phlogisticated air was also present. This experiment was performed quantitatively, and as a result there seemed "the utmost reason to think that dephlogisticated air is only water deprived of its phlogiston, and that inflammable air . . . is either phlogisticated water, or else pure phlogiston, but in all probability the former." In other words, water was apparently composed of what we now term oxygen and hydrogen, the latter being identified with phlogiston.

Having arrived at this conclusion, Cavendish proceeds to say that "there is the utmost reason to think that dephlogisticated and phlogisticated air, as M. Lavoisier and Scheele suppose, are quite distinct substances, and not differing only in their degree of phlogistication." Accordingly, "it follows, that instead of saying air is phlogisticated or dephlogisticated by any means, it would be more strictly just to say it is deprived of, or receives, an addition of dephlogisticated air."

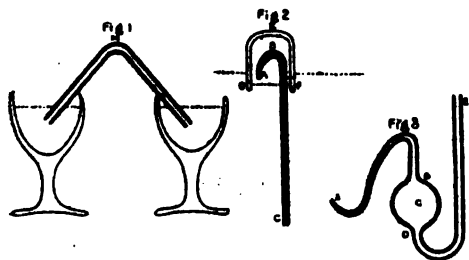
A number of Priestley's experiments were next repeated by Cavendish, and he found amongst other matters "that mercurius calcinatus and red precipitate, though prepared in a different manner, are very nearly the same thing." The phlogiston

theory, however, pervades all the work here recorded, in such a manner as to give rise to wonder that any definite results whatever were arrived at. Thus it is stated that "vegetables seem to consist almost entirely of fixed and phlogisticated air, united to a large proportion of phlogiston and some water, since by burning in the open air, in which their phlogiston unites to the dephlogisticated part of the atmosphere and forms water, they seem to be reduced almost entirely to water and those two kinds of air." Further confirmation is here afforded, however, of the recognition of the fact that water is composed of two distinct substances, and also that one of those constitutes a portion only of atmospheric air.

Reference to Lavoisier's disbelief in the phlogiston theory and his explanation of phenomena by attributing changes in compounds to the absorption or expulsion of dephlogisticated air, is followed by the remark that the foregoing experiments may be equally well explained by the new theory. "According to this hypothesis, we must suppose that water consists of inflammable air (hydrogen) united to dephlogisticated air (oxygen); that nitrous air, vitriolic acid air, and the phosphoric acid are also combinations of phlogisticated air (nitrogen), sulphur, and phosphorus with dephlogisticated air, and that the two former, by a further addition of the same substance, are reduced to the common nitrous (nitric) and vitriolic (sulphuric) acids." At the same time, Cavendish remarks that, since "the commonly received principle of phlogiston explains all phenomena, at least as well as M. Lavoisier's," he prefers to adhere to the former.

FURTHER EXPERIMENTS ON AIR.

Having thus determined the composition of water, Cavendish next proceeded to study the constitution of atmospheric air. In a paper read before the Royal Society on June 2, 1785, he announced that he now found that the phlogistication of air by the electric spark did not proceed from phlogiston so communicated, but that it depended upon the conversion of phlogisticated air (nitrogen) into nitrous (nitric) acid. The apparatus employed in his experiments was as follows:—



APPARATUS EMPLOYED BY CAVENDISH.

The bent glass tube M (Fig. 1), was filled with mercury and inverted into two glasses containing the same, and the air to be experimented upon was then introduced into it by means of a bent thermometer tube A B C (Fig 2). The bent end of this tube, after being previously filled with quicksilver, was introduced, as represented in the figure, under the glass D E F, which was filled with air and inverted into water. The end C of the tube was kept stopped by the finger, on removing which the quicksilver descended in the leg B C, and was re-

placed by air from the glass D E F. The end C was then again closed by the finger, the tube inverted, and the small end A introduced into one end of M (Fig. 1). On removing the finger the pressure of the quicksilver in B C forced the air into M. Liquids could be manipulated in the same manner.

When it was desired to introduce air into the tube many times a small-bore tube A B (Fig. 3), connected with the bulb C and large-bore tube D E, was filled with quicksilver. Air was then introduced into C and A B by introducing the end A under a glass inverted into water and containing air, as in Fig. 2, the quicksilver in E D being meanwhile extracted by means of a syphon. The apparatus filled with air was then weighed, and the end A introduced into one end of M (Fig. 1) and kept there during the experiment. By thrusting down the tube E D a wooden cylinder of almost the same size as the bore, and adding quicksilver from time to time to replace that pushed into C, the air was forced out of the apparatus. At the conclusion of the experiment the apparatus was again weighed and the amount of air forced into M thus determined, "it being equal in bulk to a quantity of quicksilver, whose weight was equal to the increase of weight of the apparatus."

THE CONSTITUTION OF NITRIC ACID.

When the electric spark was passed through common air enclosed in this apparatus, between short columns of litmus solution, the latter became red and the air was diminished. Using lime water instead of litmus solution, the air was reduced to two-thirds of its original bulk, and a similar result was obtained when the air was replaced by impure dephlogisticated air. It was concluded, therefore, that the lime water was saturated by some acid formed during the operation. "When good dephlogisticated air was used the diminution was but small; when perfectly phlogisticated air was used no sensible diminution took place; but when five parts of pure dephlogisticated air were mixed with three parts of common air, almost the whole of the air was made to disappear. It must be considered that common air consists of one part of dephlogisticated air, mixed with four of phlogisticated; so that a mixture of five parts of pure dephlogisticated air and three of common air is the same thing as a mixture of seven parts of dephlogisticated air with three of phlogisticated." Absorption of the acid formed by soap-lees resulted in the formation of nitre, and the amount of salt formed was ascertained to be "pretty equal in weight to the nitre which that quantity of soap-lees would have afforded if saturated with nitrous acid."

The fact that when nitre was detonated with charcoal the nitrous acid was converted into phlogisticated air, was considered to prove that phlogisticated air was nothing but nitrous acid united to phlogiston. By depriving it of the latter, therefore, it ought to be reduced to nitrous acid, "but as dephlogisticated air is only water deprived of phlogiston, it is plain that adding dephlogisticated air to a body is equivalent to depriving it of phlogiston and adding water to it; and, therefore, phlogisticated air ought also to be reduced to nitrous acid by being made to unite to, or form a chemical combination with, dephlogisticated air;

only the acid formed this way will be more dilute than if the phlogisticated air was simply deprived of phlogiston." The conclusion drawn, therefore, was that dephlogisticated air (oxygen) was able to deprive phlogisticated air (nitrogen) of its phlogiston and convert it into nitrous (nitric) acid, when assisted by the electric spark. The discovery of the composition of nitric acid was therefore complete.

THE CONSTITUENTS OF ATMOSPHERIC AIR.

The experiments already recorded had confirmed the opinion of Scheele and Lavoisier that atmospheric air virtually consisted of two distinct gases, and that these constituted a mixture and not a compound body, but Cavendish proceeded to point out that as far as the experiments previously published went, but little was known of the nature of the phlogisticated part of the atmosphere, beyond that it was not diminished by lime water, caustic alkalies, or nitrous air; that it was unfit to support fire or maintain life in animals; and that its specific gravity was not much less than that of common air. Though nitrous (nitric) acid, therefore, by being united to phlogiston was converted into air possessed of those properties, and consequently, though it was reasonable to suppose that part at least of the phlogisticated air of the atmosphere consisted of this acid united to phlogiston, yet it might fairly be doubted whether the whole was of that kind, or whether there were not in reality many different substances confounded together under the name of phlogisticated air. He therefore "made an experiment to determine whether the whole of a given portion of the phlogisticated air of the atmosphere could be reduced to nitrous acid, or whether there was not a part of a different nature from the rest which would refuse to undergo that change."

Former experiments were considered to have, in some measure, decided that point, but a mixture of dephlogisticated air and common air was now operated upon, in the same manner as before, till it was reduced to a small part of its original bulk. Cavendish, in order to decompose as much as he could of the phlogisticated air which remained in the tube, next added some dephlogisticated air to it, and continued to pass the electric spark till no further diminution took place. Having by those means condensed as much as he could of the phlogisticated air, he admitted some solution of liver of sulphur to absorb the residual dephlogisticated air; "after which only a small bubble of gas remained unabsorbed, which certainly was not more than 1/120 of the bulk of the phlogisticated air let up into the tube; so that if there is any part of the phlogisticated air of our atmosphere which differs from the rest, and cannot be reduced to nitrous acid, we may safely conclude that it is not more than 1/120 part of the whole."

RESULTS OF CAVENDISH'S EXPERIMENTAL WORK.

The practical outcome of the experimental work of Cavendish, therefore, was to establish the facts that water is a compound of inflammable air (hydrogen) and dephlogisticated air (oxygen), and also that nitrous (nitric) acid is formed by the union of dephlogisticated air (oxygen), and phlogisticated air (nitrogen) in the presence of water. Further, he proved that the air is virtually a mixture of four parts of phlogisticated air and one part of dephlogisticated air, the equivalent of 1/120 part of the former, however, being incapable of conversion into nitrous

acid.* These results are remarkable inasmuch as they are in complete accord with those of the most recent modern researches, in spite of the crudity of the apparatus with which Cavendish worked, and the manner in which he was hampered by a fallacious theory. Though he made comparatively few discoveries, his work was distinguished by its exactness and completeness. He was one of the first chemists to regularly employ quantitative methods, and Sir Humphry Davy said of his researches "that they were all of a finished nature, and though many of them were performed in the very infancy of chemical science, yet their accuracy and their beauty have remained unimpaired."

THE APPROACHING REVISION OF THE BRITISH PHARMACOPOEIA.†

I.

FROM A PRESCRIBER'S POINT OF VIEW.

BY T. LAUDER BRUNTON, M.D., D.S.C. EDIN., LL.D. HON. ABERD., F.R.C.P., F.R.S.

Lecturer on Pharmacology and Therapeutics, and Assistant Physician to St. Bartholomew's Hospital, London.

The Scope and Objects of the British Pharmacopœia.—Redundancies and Deficiencies.—Solubility and Compatibility.—Prescribing Difficulties and the Increase of Proprietary Preparations.—Pills and Granules.—A Complicated Poultice.—Dosage.

The announcement that a new edition of the British Pharmacopœia is in preparation naturally leads everyone who is interested either in the administration or preparation of medicines to ask what changes are likely to be made in it so as to make it more useful or more convenient. The object of the Pharmacopœia is thus stated in the preface to the edition of 1867. "It is intended to afford to the members of the medical profession, and those engaged in the preparation of medicines throughout the British Empire, one uniform standard and guide whereby the nature and composition of substances to be used in medicine may be ascertained and determined." From the definition thus given by the General Medical Council, it is evident that the scope of the British Pharmacopœia is very wide indeed, whether we regard the number of practitioners and chemists whom it is intended to help, and who must be numbered by tens of thousands, or the extent over which its influence will spread—and this is no less than an empire on which the sun never sets, or the number of people whose health and lives it is intended to safeguard—and these are to be numbered by hundreds of millions.

It is not my intention here to speak of the British Pharmacopœia in its relation to the enormous part of the British Empire which lies outside of Great Britain

* Cavendish appears to have been satisfied that this small residue differed both from dephlogisticated air and phlogisticated air, though he did not examine it further. The result of Rayleigh and Ramsay's recent work, therefore, has been to confirm his indication.

† From the *British Medical Journal*.

and Ireland, nor of its use by pharmaceutical chemists and dispensers, but only of its use to the prescriber. The medical profession has much cause to thank the General Medical Council for the unification of the London, Dublin, and Edinburgh Pharmacopœias; but, notwithstanding the time and labour that have been expended upon the British Pharmacopœia in successive editions it is still far from perfect, and much more may still be done in the way of rendering it useful to the medical man. He it is for whom the book is primarily intended. It is a work issued by the General Medical Council as a standard and guide to the members of the medical profession, and only secondarily to chemists and pharmacists. This is seen by the fact that the latter have no direct voice in the preparation of the Pharmacopœia, and have only been called in to give advice when required. Yet in the consulting rooms and libraries of doctors in general the British Pharmacopœia is generally conspicuous by its absence, so much so that one is often tempted to ask who have bought up the thousands of copies issued by the General Medical Council.

But while comparatively few medical men possess a British Pharmacopœia, nearly every one has got either Squire's 'Companion' or Martindale and Westcott's 'Extra Pharmacopœia,' or both, and it may be worth while to inquire why it is that these works enjoy so much greater a popularity than the British Pharmacopœia. One reason probably is that they give less, and another that they give more than the official publication. They give less because they leave out the methods of preparing the various substances which no medical man or dispensing chemist ever dreams of making, and they give more, inasmuch as they supply useful information about the preservation of medicines and different modes of prescribing them in a more or less agreeable form, as well as hints, or even fairly full, statements about their action and uses. Thus, if we turn to such a common article as chloroform in the Pharmacopœia, we find that the greatest part of the space allotted to it is taken up by an elaborate description of how to make it. This is of no use to either dispensing chemists or to medical men, for they both purchase their chloroform from well-known firms who manufacture it on a large scale. But no hint is given of the advisability of keeping it in a dark place, although the advisability of keeping it cool is mentioned. On turning to ether we again find a long process for making it, but not a word is said about keeping it in a cool place away from lights or fire, so as to avoid the possibility of an explosion or conflagration. Under collodion we find mention of the inflammability of the liquid, but nothing about the necessity of keeping it at a distance from fire or light on account of the inflammability of its vapour, although the neglect of such a precaution has before now cost an unfortunate patient her life. This precaution is brought prominently forward by Martindale, and is also mentioned in the American Pharmacopœia. There are only a few examples from a very large number, and the constant occurrence of directions for preparing substances which no medical

man is ever likely to prepare not only makes the work more bulky, but is the actual annoyance to many men who consult it and find there the presence of so much that they do not want, along with the absence of what they do want. It might therefore be suggested that a useful alteration in the new edition of the Pharmacopœia would be to omit directions for the preparation of substances which are never prepared by medical men or by dispensing chemists, and at the same time to give fuller directions than at present for the proper keeping of medicines, so that they may not lose their efficacy or become actually harmful by keeping in stock, although originally they may have been perfectly good.

As the Pharmacopœia is intended as a guide whereby the nature and composition of substances to be used in medicine may be ascertained, it is only fair on the part of the medical practitioner, for whose benefit it has been compiled, to ask that it should give certain directions as to the result of mixing various drugs. Thus, under the headings of perchloride of iron and iodide of potassium we find long descriptions of their mode of preparation, but there is no suggestion that the practitioner who combines these two ingredients for the benefit of a rheumatic and anæmic patient will get free iodine produced by the mixture, and thus, in all probability, irritate the stomach of his patient. It is natural also that he might like to know that borax, although it has got a faintly alkaline reaction, may act as an acid, and that the mixture of glycerin of borax and bicarbonate of sodium may cause such effervescence as to blow out the cork or burst the bottle either in the patient's pocket, or in transit through the post, to the great damage of Her Majesty's mails. A similar remark may be made about the sub-nitrate of bismuth. It is quite fair to expect a man to know that if he mixes bicarbonate of sodium with a strong solution of sulphate of magnesium he will very likely convert the whole into a paste, for these drugs have been in use for centuries; but a table of solubilities would be most valuable, not only in the case of remedies of recent introduction, but of old remedies where the solubility of unusual compounds is not known so well. One may know in a general way that alkaloids are precipitated by tannin, but it is almost impossible for anyone to be certain, without actual experiment, whether the tannin in a vegetable infusion will be sufficient to precipitate a small quantity of an alkaloid. For example, most men do not know whether the strychnine out of ten drops of tincture of nux vomica will be precipitated by the tannin in an ounce of infusion of gentian, nor can this knowledge be obtained from ordinary textbooks. A body such as the General Medical Council, entrusted with the preparation of the Pharmacopœia, is the proper body to have experiments made to settle such questions.

Another important point in solubility, and one which would be very useful were the Pharmacopœia to give it, is the quantity of various substances contained in cold water after they have been once dis-

solved by heat; for example, sulphonal dissolves in 500 parts of cold water and in 15 of hot; but I cannot find any information as to whether a quantity of it remains in solution after it has once been dissolved, or whether it all separates out on cooling. The same information regarding other solvents would be very useful. Thus Squire mentions under the head of compound tincture of chloroform that "The original British Pharmacopœia instructions read 'dissolve the hydrochlorate of morphine and oil of peppermint in the spirit,' and when it was discovered that it would not dissolve the word was changed to 'diffuse,' but by gently warming the three together a solution is at once obtained which does not precipitate on the addition of the other ingredients."

A second useful alteration in the Pharmacopœia, then, would be the introduction of a very complete table of solubilities, not only of substances actually contained in the Pharmacopœia, but of those likely to be formed by admixture with other drugs, and also of the amount of substances which remain in solution in a cold solvent after they have once been dissolved by heat.

But one of the great advantages, and perhaps the chief advantage, which the two books I have mentioned possess over the British Pharmacopœia is that they give the practitioner some idea of how to administer the medicine he desires in a form in which it can be taken by the patient. On looking up *copaiba*, for example, we find no directions regarding its administration in the Pharmacopœia, except that its dose is $\frac{1}{2}$ to 1 drachm, and the directions regarding the oil are equally scanty. The probability is that the practitioner who trusted entirely to the British Pharmacopœia for his preparations of the drug would administer either the one or the other in a form that his patient could not or would not take, so that the patient would either fail to be cured or would go to seek advice elsewhere. In Squire's 'Companion,' on the other hand, we find ample directions for covering the disagreeable taste, and also the information that both balsam and oil can be put into capsules. It would be a great boon, both to practitioner and patient, if the new edition of the Pharmacopœia could utilise some of the space which might be gained by cutting out useless directions for making drugs by putting in useful directions for prescribing them. Such directions are becoming all the more necessary on account of the old system of apprenticeship falling into disuse and of many men writing out prescriptions which are dispensed by the chemist instead of dispensing their own medicines. The practical knowledge which medical men formerly gained, either in the course of their apprenticeship or by making up medicines in their own dispensary, enabled them to put together mixtures which were by no means unpalatable to the patient. But one who simply prescribes is handicapped by not knowing whether the components of his mixture will not produce a heavy precipitate, a disagreeable colour, or an abominable taste, and he has no chance, like the dispenser of his own medicines, of rectifying his mistake when the medicine is made up, for it goes

direct to the patient instead of being seen, tasted, and approved of by the doctor himself. It is to a great extent in consequence of these difficulties that so many proprietary preparations are now prescribed, because such preparations, containing, as many of them do, useful drugs, are made up in such a way as to be not unpleasant, even if not actually agreeable to the patient. It would be a great benefit to the prescriber if the General Medical Council were to help him in his difficulty, and give him some directions to guide him in the way of making his medicines agreeable. We have already in the Pharmacopœia several syrups intended for this purpose, but we might have also an elixir, such as that of the United States Pharmacopœia, and perhaps other aids as well.

But it is often almost impossible to make the taste of medicine agreeable, and if they are in solution the patient feels on his palate the full force of their disagreeable taste. The only way of getting over this difficulty is to give the medicine in the form of a pill or capsule or cachet. We have in the Pharmacopœia no mention whatever of wafers or cachets, nor are capsules official, although all these are most useful aids in the administration of disagreeable medicines. Their introduction would surely be a step in the right direction.

Another complaint that patients make when the pills of the Pharmacopœia are prescribed (dozed as most of them are to 5 grains) is that the pills are so large that they cannot swallow them. It might be worth while for the Pharmacopœia Committee to consider whether it might not be advantageous to increase the standard strength of the pill mass so that $2\frac{1}{2}$ grains at the outside would be a sufficient dose. But even pills of $2\frac{1}{2}$ grains are comparatively large, and many people will swallow granules the size of a pin's head when they will not take a pill. Especially is this the case with children and with people who are much away from home, and who object to carrying bulky medicines in their pockets. In this respect the preparations of some of the French pharmacists are worthy of imitation. These consist of small granules of sugar of milk, each the size of a pin's head, each containing a definite dose of a powerful medicine, such as half a milligramme ($1/126$ of a grain) of strychnine or atropine, or a milligramme ($1/63$ of a grain) of arsenious acid, digitalin, or morphine. As a means of prescribing active medicines these granules are most convenient, and the only disadvantage is that people may mistake them for homœopathic medicines to their own great disadvantage. Thus, a patient for whom I prescribed arsenic in this form thought the granules so innocent-looking that he took more than I advised him, and in ten days came back with well-marked symptoms of arsenical poisoning. These granules are, of course, only adapted for the administration of powerful drugs in small doses, and such drugs are already beginning to be much used in the form of small compressed tabloids, which can either be taken internally or dissolved in a drop or two of water, and injected hypodermically. The use of such tabloids obviates

one of the great difficulties of hypodermic injections, namely, the tendency to decompose, or to alter in strength. They also afford a ready means of measuring out the dose accurately. The larger tabloids, such as those of soda mint, are also so convenient for carrying about, that it would be useful to have something of this sort also in the new edition of the Pharmacopœia.

Besides omitting the description of things that are not made by medical men or dispensers, the new Pharmacopœia might be improved by the revision of the directions for things that might be made. Thus, under the head of cataplasma conii, we find that an ounce of hemlock juice is to be evaporated to half its volume, and this mixed with half a pint of boiling water and a quarter of a pound of linseed meal. I have never made this poultice myself, nor do I know of anyone who has ever made it, but if such a poultice has been made, it would be interesting to learn who evaporated the hemlock juice and who made the poultice, because if the chemist evaporated the juice and made the poultice it would be cold before the patient got it, and if the juice were evaporated at home there would probably be no proper dish to evaporate it in. Any ordinary person would simply have used a little less boiling water or a little more linseed meal and left the hemlock juice without evaporation.

The enema asafetidis is one of the most useful remedies in the whole Pharmacopœia, but probably it is very rarely indeed made by the pharmacopœial method. Instead of the asafetida being rubbed up with distilled water, a little of the tincture is simply mixed with the water and the mixture injected.

Although such an innovation would be warmly welcomed by many a medical man it is, perhaps, too much to hope that in the forthcoming edition of the Pharmacopœia we should find some indication of the actions of medicines such as are contained in the two other works I have already mentioned. But in regard to dosage it would certainly be a distinct advantage if the maximum quantity to be given in a day was indicated, as well as that for each individual dose. It might also be made compulsory, as in the German Pharmacopœia, for the medical man, when prescribing a quantity larger than the ordinary, to indicate the fact that he is aware of what he is doing by drawing the chemist's attention to this by means of a mark of exclamation. This proceeding necessarily lessens the risk of the patient getting an overdose by misadventure on the part of the prescriber.

It is very easy to suggest alterations in the Pharmacopœia; it may be very difficult to carry such suggestions into practice. Those I have made, even if they should be approved, cannot be carried out without the employment of skilled labour, and much experimental work necessitating the expenditure of a good deal of time and money. Yet what body can do this so well as the General Medical Council? And if it can produce a Pharmacopœia better than any other existing one, the medical profession, not only in the three kingdoms but over the world-wide British Empire will repay its labours with gratitude.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, FEBRUARY 9, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 6, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Broadbridge, — 17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

LAST Wednesday the business transacted by the Council was chiefly of a routine nature. After the minutes of the previous meeting had been read and confirmed, the PRESIDENT mentioned the receipt of a letter from the family of the late Mr. HOOPER, in acknowledgment of the expression of condolence sent by the Council. He also apologised for the absence of the Treasurer in consequence of ill-health, but hoped Mr. HAMPSON would soon be fully restored to health. A letter received from the Editor of the *Chemist and Druggist* communicating intelligence of the death of Mr. S. M. BURROUGHS, afforded opportunity for recalling the fact that, besides being a generous contributor to the Benevolent Fund, Mr. BURROUGHS had always sympathetically participated in the social gatherings of pharmacists. On those grounds the proposal that a letter of condolence should be sent to Mrs. BURROUGHS was unanimously responded to by the Council.

Mr. WARREN, in thanking the Council for electing him a member, and especially the country members who proposed, seconded, and supported his election, claimed to be, from his experience and early associations, pre-eminently a representative of the country members of the trade. In that position he would be proud to uphold the tradition, honour, and character of the Society, and endeavour to assist in promoting that competition for excellence in the exercise of the pharmacist's calling, which has always been the object of the Society.

The members of Council who are to retire in May were then determined and ascertained to be: MESSRS. ATKINS, GROSE, HARRISON, HILLS, MACTINDALE, NEWSHOLME, and RICHARDSON.

Those retiring by rotation are Messrs. ALLEN, BOTTLE, CARTEIGHE, GREENISH, HAMPSON, SOUTHALL, and YOUNG.

The additions to the Society comprised seven Members, thirty-seven Associates, and twenty-nine Students.

The Registrar's report for the year 1894 was then presented (see pages 670, 671).

The report of the Finance Committee mentioned the receipt of £10 from Professor MICHAEL FOSTER as a donation to the Benevolent Fund, and in moving the adoption of the report, the PRESIDENT said that a letter has been received by the Secretary intimating that the late Mr. HOOPER had left a legacy of £100 to the Benevolent Fund.

On the recommendation of the Benevolent Fund Committee, a grant of £10 and one of £5 were ordered to be paid.

The consideration of the form to be given to a Pharmacy Act Amendment Bill by the Law and Parliamentary Committee has not yet led to agreement on this subject, and the discussion of it has been adjourned.

In a communication from the Privy Council attention was called to the regulations applying to the sale of drugs in Austria-Hungary, and the Council was requested to furnish information as to whether any similar regulations were in force in the United Kingdom.

As a result of the consideration of Sir RICHARD QUAIN's request that the Council should nominate members of a Pharmaceutical Committee to take part in the work of pharmacopœia revision, and upon the recommendation of the General Purposes Committee the Council appointed, for present purposes, the members of the Committee that was engaged in 1890 in the preparation of the addendum to the Pharmacopœia, with the addition of Mr. WALTER HILLS in the place of the late Mr. GALE. The PRESIDENT mentioned that Mr. PETER W. SQUIRE had been requested to act upon the Committee, and that he regretted Mr. SQUIRE's other engagements would prevent him from devoting to the work of the Committee the amount of time it would require.

THE BRITISH PHARMACOPŒIA.

THE contemplated revision of the national medicine book appears likely to give rise to a number of questions of more or less importance, in regard to the precise nature which this official work should possess in order to satisfy modern requirements. The discussion of this subject at the late meeting of the General Medical Council, vague and desultory as it was, indicated the existence of some desire on the part of medical men to exclude from the Pharmacopœia much that it now contains, and to supply its place by the introduction of matter which has not hitherto been generally regarded as coming within the scope of such a work. It may be inferred

from remarks made on that occasion by some of the speakers that the introduction of information of a therapeutic nature is considered to be an important desideratum, at the present time, to serve as a guide to medical practitioners in the administration of medicinal agents and as an assistance to them in prescribing.

Such an alteration of the Pharmacopœia would amount to a reversion to the system adopted in the well-known though now antiquated 'Pharmacologia' of Dr. Paris, and this suggested change raises a question as to whether a Pharmacopœia is the most suitable place for furnishing information necessary for a proper exercise of the art of prescribing. That is to such a very large extent a question to be decided from a medical point of view and by medical authorities, that it may be left altogether out of consideration here. The further question whether it is necessary to provide medical men with such information as to the uses, relations, and modes of administering medicinal agents is also one more directly concerning medical men than pharmacists, though many experienced dispensers are all cognizant of the difficulties they sometimes have to deal with in the preparation of medicines whose ingredients are incongruous. On this point, however, the matter has been treated of from a prescriber's point of view by Dr. LAUDER BRUNTON in the first of a series of articles which are to appear in the *British Medical Journal*. We reproduce this article in full in this number of the Journal (see page 664) for the information of our readers, and for the present reserve any comment upon it.

PRESCRIBING BY CHEMISTS.

THE *British Medical Journal* comments with some severity on a recent fatal result of what is termed "the mischievous practice carried on to a large extent by some chemists." In reference to the chemist's excuse for supplying the medicine that he would not have done so "if the facts of the case had been known to him," it is remarked that nothing can justify such a haphazard distribution of potent medicines, which is quite as objectionable as the worst form of nostrum mongering. It is also urged that, in view of the exceptional privileges conferred upon chemists and their demand to be regarded as something more than ordinary tradesmen, the leaders of the pharmaceutical body should direct their attention to discountenancing practices which are calculated to interfere with the well-being of that body and to obstruct its progress. The *Lancet*, in speaking of this case, laments that the poorer classes make no distinction between a "doctor" and a "chemist." They are both people from whom you may get a "bottle" at eighteen pence or a "pink powder" for twopence. Unhappily that is true, but there is more reason for lamenting that doctors help to keep up such a mistaken confusion. Otherwise the *Lancet* very fairly remarks that death can but rarely be traced to the action of any drug supplied by a chemist, although the dangers arising from injudicious prescribing by chemists are very properly insisted upon.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, February 6, 1895.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT,

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT,

Messrs. Allen, Atkins, Bottle, Gostling, Greenish, Grose, Harrison, Hills, Johnston, Martin, Martindale, Newholme, Richardson, Schacht, Southall, Storrar, Warren, and Young.

The minutes of the last Council meeting were read and confirmed.

The PRESIDENT said he had to apologise for the absence of the Treasurer, who, he was sorry to say, was not well enough to come up. He was sure that all his colleagues would join in the hope that Mr. Hampson would soon be thoroughly restored to health.

THE LATE EDWARD HOOPER.

A letter had been received from the family of the late Mr. Hooper in acknowledgment of a letter of condolence recently sent.

THE LATE MR. S. M. BURROUGHS.

The PRESIDENT also said he had received from the editor of the *Chemist and Druggist* a letter, announcing the death of Mr. S. M. Burroughs at Monte Carlo, from pneumonia. Mr. Burroughs was known to many, both in business and personally, and although not a member of the Society, he had identified himself for many years with the Benevolent Fund and had contributed to the Journal and taken part in social gatherings. It was only right, therefore, that he should be allowed to send a letter to Mrs. Burroughs expressing the great regret of the Council at his premature decease. It was very pleasant to think that one who had been so successful in the prosecution of his business enterprises should have been so continuously sympathetic and generous to the Benevolent Fund. He had the opportunity of coming into close association with him at Chicago, and in other quarters; there was but one opinion expressed among his fellows—that of regard for the liberality of the man, and of appreciation of his social qualities. It would be a matter of universal regret that his career had been terminated so prematurely.

NEW MEMBER OF THE COUNCIL.

Mr. WARREN said he desired to thank the Council for the very great honour they had done him in electing him on the Council again. It was a great satisfaction to him that the proposer, seconder, and those who spoke in support of the proposal were friends from the country. If it was true that early associations made the greatest impression on the mind, and tended to mould and form one's sympathies, he might claim perhaps to be pre-eminently a country man and member, for he was apprenticed in a small agricultural town, served as a junior in a seaside place, and as a senior in the Midlands. So varied and pleasant were the interests and the friendships thus formed, and the

experience gained, that he should always strongly impress upon any he knew as about to enter their calling to keep away from London until he was thoroughly matured. His election came to him as a great surprise, and he hoped he might say, without being regarded as ungracious, that had he been made aware of what was in the minds of his friends he might not have accepted the honour; but a cheque having been drawn upon him he should do his best to honour it. The traditions, the history, and the character of the Pharmaceutical Society, whether regarded from the standpoint of a private member or a member of the Council, were of such a kind as to lead him to feel that there was no institution to which he should feel more proud to belong. He would take the opportunity whilst speaking of expressing a hope that in the excessive competition which prevailed, and the general depression of trade, this Society would never forget that one of its aims was the general amelioration of its members, and that there was a human side and a brotherhood to be considered on all occasions of their distress. He hoped that there might be such an accession of strength to their numbers as might enlarge the Society's bounds and tend to make their calling one not only worthy of following, but also one in which men might earn a decent livelihood.

On the proposition of the PRESIDENT, Mr. Warren's name was added to the Law and Parliamentary Committee, the Benevolent Fund, and the School and House Committee.

THE LOT FOR THE NEXT COUNCIL.

The lot having been taken in the usual way to determine the seven members of Council who shall retire in May next, the following names were drawn:—

Atkins.	Grose.	Harrison.
Hills.	Martindale.	Newholme.
Richardson.		

The following who remained in by lot last year now retire by rotation:—

Allen.	Bottle.	Carteighe.
Greenish.	Hampson.	Southall.
Young.		

The following seven remain in office another year:—

Cross.	Gostling.	Johnston.
Martin.	Schacht.	Storrar.
Warren.		

ELECTION OF MEMBERS.

Pharmaceutical Chemists.

The following having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Johnson, Herbert Mellor	Blackpool.
Matthews, Herbert Rouse	London.
Pickering, Walter	Darlington.
Potter, Henry Arthur	Peckham.
Robertson, William George	Cupar.

Chemists and Druggists.

The following who were in business before August 1, 1888, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Hemingway, Walter	London.
Smith, Samuel	New Swindon.
Wilford, John	Nottingham.

REGISTRAR'S REPORT.

MEMBERS, ASSOCIATES, AND STUDENTS OF THE SOCIETY FOR THE YEAR 1894.

	Life Compounders.			Annual Subscribers.				
	Members.		Associates in Business.	Members.		Associates in Business.	Associates not in Business.	Students.
	Pharm. Chemists.	Chem. & Druggists.		Pharm. Chemists.	Chem. & Druggists.			
Number in 1893 ...	232	6	23	1406	606	1544	...	...
" restored, 1894 ...	...	...	...	6	6	11	...	...
" elected, 1894 ...	16	1	2	62	21	165	...	...
	248	7	25	1474	633	1720	...	...
Deaths, Secessions, etc. ...	7	...	...	76†	30	126†	...	...
Total Strength of the Society	241	7	25	1398	603	1594	980	819
Summary:—								
1893 ...	232	6	23	1406	606	1544	995	811
1894 ...	241	7	25	1398	603	1594	980	819
Increase ...	9	1	2	...	...	50	...	6
Decrease ...	...	...	...	8	3	..	15	...

COMPARATIVE STATEMENT OF THE NUMERICAL STRENGTH OF THE SOCIETY FOR 5 YEARS: 1890-94.

MEMBERS.—PHARMACEUTICAL CHEMISTS.

	1890	1891	1892	1893	1894
Restored to Membership ...	11	14	21	12	6
Elected " ...	67	76*	72	62	62
(Total additions) ...	78	90	93	74	68
Deaths, Secessions, etc. ...	80	84	135†	89†	76†
Increase ...	...	6	...	...	...
Decrease ...	2	...	42	15	8
Total Number of Annual Members ...	1457	1463*	1421	1406	1398

ASSOCIATES IN BUSINESS.

	1890	1891	1892	1893	1894
Restored ...	7	12	36	19	11
Elected ...	123	146	175	182	165
(Total additions) ...	130	158	211	201	176
Deaths, Secessions, etc. ...	90	84	108†	100†	126†
Increase ...	40	74	103	101	50
Decrease ...	...	...	...	...	...
Total Number of Annual Associates in Business ...	1266	1340	1443	1544	1594

ASSOCIATES NOT IN BUSINESS.

	1890	1891	1892	1893	1894
Increase ...	...	161	...	...	...
Decrease ...	51	...	11	24	15
Total Number of Associates not in Business ...	869	1030	1019	995	980

MEMBERS.—CHEMISTS AND DRUGGISTS.

	1890	1891	1892	1893	1894
Restored to Membership ...	3	4	4	1	6
Elected " ...	18	9	62	37	21
(Total additions) ...	16	13	66	38	27
Deaths, Secessions, etc. ...	42	27	31†	35	30
Increase ...	...	...	35	3	...
Decrease ...	26	14	...	...	3
Total Number of Annual Members ...	583	563	603	606	603

STUDENTS.

	1890	1891	1892	1893	1894
Increase ...	...	52	...	14	8
Decrease ...	23	...	140	...	...
Total Number of Students ...	885	937	797	811	819

LIFE COMPOUNDERS.

	1890.	1891.	1892.	1893.	1894.
Members:—Pharmaceutical Chemists ...	195	186	223	223	241
Increase ...	...	...	36	10	9
Decrease ...	11	9	...	...	...
Members:—Chemists and Druggists ...	2	2	6	6	7
Increase ...	...	...	4	...	1
Associates in Business ..	...	...	14	23	25
Increase ...	...	...	14	9	2

* One of these paid as an Associate in Business, but afterwards passed the Major examination, and was elected a Member.

† Some of these paid the Life composition fee.

ANALYSIS OF EXAMINATIONS FOR THE YEAR 1894.

FIRST EXAMINATION.

Number of Candidates during the Year.	Number of successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average number of Candidates at each Examination.	Average number of Rejections at each Examination.	Percentage of Rejections.
1541	753	788	4	385.25	197.00	51.13

Number of Certificates received in lieu of the First Examination ... 106

MAJOR, MINOR, AND MODIFIED EXAMINATIONS.

ENGLAND AND WALES.

Examinations.	Number of Candidates during the Year.	Number of Successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of rejections at each Meeting.	Percentage of Rejections.
Major	136	68	68	4	34.00	17.00	50.00
Minor	970	344	626	4	242.50	156.50	64.53
Modified	One Candidate presented himself and failed.						

SCOTLAND.

Examinations.	Number of Candidates during the Year.	Number of successful Candidates during the Year.	Number of Rejections during the Year.	Number of Examinations during the Year.	Average Number of Candidates at each Meeting.	Average Number of rejections at each Meeting.	Percentage of Rejections.
Major.....	11	6	5	4	2.75	1.25	45.45
Minor.....	440	180	260	4	110.00	65.00	59.09

THE REGISTERS OF PHARMACEUTICAL CHEMISTS AND CHEMISTS AND DRUGGISTS, 1894.

Additions during the year:—				Erasures during the year:—	
Number of persons who have passed the—				Deaths	253
Minor	"	.....	524	Erased at the request of registered persons themselves	}
Major	"	.....	74*	Erased by the Registrar in pursuance of the provision set forth in Section 10 of the Pharmacy Act, 1868, after sending two registered letters, to which no answer has been received.	
Number of persons restored to the Register on payment of a fine				18	246
Number of persons registered on payment of the registration fee, having been in business before August 1, 1868				3	38

ELECTION OF ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Baker, William Weaver	.....	Brookley.
Coleman, John Harold	.....	Wolverhampton.
Davies, David John	.....	Swansea.
Evans, Daniel Thomas	.....	Margate.
Fletcher, John	.....	Ashby.
Hannah, Henry	.....	Paisley.
Hemingway, Edward	.....	London.
Hirst, Edward	.....	Colne.
Hough, Thomas	.....	Northwich.
Johnstone, James	.....	London.
Kirkpatrick, James	.....	Taunton.
Lewis, David Llewelyn	.....	Baling.
Moir, David	.....	Glasgow.
Otty, William Hare	.....	Birmingham.
Peterkin, James	.....	Loosemouth.
Richardson, Sylvester		Stockton-on-Tees.

Modified.

Bass, Charles Murflet		Rugeley.
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ELECTION OF ASSOCIATES.

The following having passed the Minor examination, and tendered or paid, as Students, their subscriptions for the current year, were elected "Associates" of the Society:—

Bennett, Sidney Bailey	.....	Widnes.
Branch, George Thomas	.....	Cambridge.
Dancy, Ralph	.....	Turners Hill.
Fisher, George William	.....	Holt.
Gordon, John Alexander	.....	Edinburgh.
Green, James	.....	Peterborough.
Greenhalgh, Edmund P.	.....	Bolton.
Gregory, John James	.....	Bredbury.
Holroyd, James	.....	Ashton-u-Lyne.
Lacy, Arthur Edward	.....	Hackney.
Marshall, Gervase Gilbert	.....	Cheadle.
Nall, Walter	.....	Rochdale.
Smith, Philip	.....	Luton.
Thomas, Hugh Wolseley	.....	Blaenavon.
Tims, Edgar Orlando	.....	Leicester.
White, Alexander Arthur	.....	Edinburgh.
Wilkinson, George Henry	.....	Dudley.
Williams, George Alfred	.....	Shrewsbury.
Wilson, William Wood	.....	Glasgow.
Wood, John William	.....	Darlington.
Wright, Charles George	.....	London.
Wyatt, Frank Leopold	.....	Manchester.

ELECTION OF STUDENTS.

The following having passed the "First" examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Aahford, Frederick Charles	.....	Northampton.
Attenborough, H. Langley	.....	Leamington.
Barnett, Henry	.....	Folkestone.
Bastow, Sidney	.....	London.
Bignell, John Henry	.....	Towcester.
Bramble, George Oliver	.....	Burnham.
Burgess, Frederick William	.....	Bradford.
Cooper, James	.....	Leicester.
Doughty, Thomas Herbert	.....	Lewisham.
Dyson, Thomas Hatfield	.....	Ilkley.
Ellis, John	.....	Leicester.
Ellul, Lawrence	.....	London.
Forster, Horace Reginald W.	.....	Chatham.
Fox, Robert	.....	Norwich.

Hardcastle, Edward	.....	Stockport.
Hardy, Thomas	.....	Sutton-in-Ashfield.
Hudson, Sidney Charles	.....	London.
Jenkins, Gwilym Reece	.....	Swansea.
Jones, John Daniel	.....	Aberystwith.
Lloyd, John Ambrose	.....	Chester.
Morrell, John George	.....	Stockton-on-Tees.
Roberts, Joseph	.....	Kingsthorpe.
Rushton, William Burton	.....	Walkden.
Saunders, Alfred Woods	.....	Maldon.
Simnett, Herbert Frank	.....	London.
Sparks, Percy	.....	Ipswich.
Spooner, William Cushing	.....	Wymondham.
Thorpe, Arthur Muxlow	.....	Spalding.
Turner, Alfred William	.....	Westbury-on-Severn.
Wilson, Harold	.....	Bridlington.

RESTORATIONS TO THE REGISTER.

The name of the following person, who has made the required declarations and paid a fine of one guinea, was restored to the Register of Chemists and Druggists:—

Thomas Broom, Sunderland Street, Houghton-le-Spring.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

REGISTRAR'S REPORT.

The Registrar's report on the numerical strength of the Society was laid on the table. It is printed at pp. 670, 671.

FINANCE COMMITTEE.

The SECRETARY read the report of this Committee, which was of the usual character, and recommended sundry accounts for payment.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report. On the Benevolent Fund £89 had been received as subscriptions, and certain ground rents and dividends, including that on the St. Paul, Minneapolis, and Manitoba Railway bond, presented some time ago by Mr. Burroughs. On the donation account £10 had been received from Professor Michael Foster.

The report was unanimously adopted.

The PRESIDENT added that the Secretary had received a letter stating that the late Mr. Hooper had left a legacy of £100 to the Benevolent Fund. He was sorry to add that Mrs. Hooper had died very shortly after her husband.

BENEVOLENT FUND COMMITTEE.

The report of the Committee included recommendation of the following grants:—

£5 to a registered chemist and druggist (51), who had two grants of £5 each in December, 1892, and February, 1894. He is quite unfitted for work, his sight and hearing being very defective. He and a daughter of fourteen rely on what the wife can earn by charring and laundry work. (Greenwich.)

£10 to the widow (61) of a member, and former subscriber. She had a grant of £10 in February, 1893, and a similar amount in February last. She is suffering from chronic rheumatic arthritis, and is able to do very little work. (Brixton.)

The further consideration of one case was deferred.

Mr. BOTTLE (as Chairman of the Committee), in moving the adoption of the report and recommendations, said fortunately the applications for relief were very light during the last month. Amongst them was the case of Mr. John Owen, an old friend of many of the Council, and a former colleague, who unfortunately had fallen into such circumstances as to require aid, but by a wise dispensation of Providence he was taken away before the application could have been considered. It would have been a very painful duty for the Committee to deal with such a case, and he really felt glad that they had been spared the task. The other cases did not call for any comment.

The resolution was carried unanimously.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received, including the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
December	Day	461	29	6	19
	Evening	109	19	1	7
Year 1894	Day	4801	36	0	17
	Evening	1665	20	1	8
Circulation of Books.		Total.	Town.	Country.	Carriage paid.
December		182	90	92	£1 2s. 2d.
Year 1894		2473	1301	1171	£14 2s. 8d.

Donations to the Library had been announced (*Pharm. Journ.*, January 19, p. 612), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

For the Library in London—

Carnegie, Law and Theory in Chemistry.

For the Library in Edinburgh—

Remington, Practice of Pharmacy, 3rd ed.
Kerner and Oliver, Natural History of Plants.
Bower and Vines, Practical Botany.
British Pharmacopoeia, with Additions, 3 copies.
Atfield, Chemistry, 15th ed.
Elborne, Laboratory Course of Pharmacy.
Journal of Botany, 1891-94, and Continuation.

Museum.

The Curator's report had been received, and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
December.	Morning	498	42	3	20
	Evening	40	6	1	2

Donations to the Museum had been announced (*Pharm. Journ.*, January 19, p. 612), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The PRESIDENT, in moving the adoption of the report, said the formal business spoke for itself. There were applications from Pharmaceutical Societies at Sheffield and Inverness for aid, and they had been deferred in order to give the Committee the opportunity of conferring with Mr. Newsholme and their friends from the North.

The resolution for the adoption of the report was carried unanimously.

LAW AND PARLIAMENTARY COMMITTEE.

The PRESIDENT announced that this Committee met and, in pursuance of the resolution carried at the last Council meeting, considered and discussed such matters pharmaceutical as came under the Committee's cognisance. In the end it was thought desirable to adjourn the discussion before presenting a report to a future meeting of the Council.

DIVISIONAL SECRETARY.

The PRESIDENT announced that Mr. Dymott, Divisional Secretary for Deptford, who was retiring from business, desired to resign his official position. He begged to move that Mr. W. Baker, of Lewisham High Road, be appointed Divisional Secretary for Deptford, in his place. He thought Mr. Baker was a very suitable man from the credentials which had been sent in.

The resolution was at once agreed to.

LOCAL SECRETARY.

Mr. Frederick Carter, of Carshalton, was appointed Local Secretary for the Carshalton District.

CERTIFICATE IN LIEU OF THE PRELIMINARY EXAMINATION.

The PRESIDENT said the Secretary had received an application from a German gentleman who desired to enter for the Minor examination, and in lieu of passing the Preliminary examination he had sent in a certificate from the Real-lyceum of Gmünden. It was a much superior examination to anything the Council required, and the Board of Examiners were perfectly prepared to accept it, but could not do so without the authority of the Council. He would therefore move that the Council approve of the certificate being received.

Mr. WARREN said he presumed one of the subjects included in the examination was English.

The PRESIDENT said it was. The gentleman in question had been some years in England.

The resolution was carried unanimously.

The PRESIDENT then said he had passed over the Benevolent Fund report somewhat rapidly, and Mr. Atkins desired to add a few words with respect to a reference in that report.

Mr. ATKINS said he thanked the President and Council for allowing him somewhat irregularly to say that he could not allow the opportunity to pass without paying his tribute of respect to the memory of Mr. Owen, who, when he (Mr. Atkins) came on the Council of this Society was doing much good and energetic work, particularly as regarded their orphans, and so anticipated the commendable and excellent efforts so ably inaugurated by the generosity of their late friend, Mr. Hyde Hills. The fact that Mr. Owen died in impoverished circumstances was no reason why they should not remember that, when in affluent circumstances, as he once was, to his knowledge he freely dispensed charity, and extended to

many a hospitality and welcome in his home. That he remembered Mr. Owen as a warm-hearted and generous man, who exerted himself in behalf of objects with which they could all sympathise, was his excuse, in presence of the rapidly disappearing number of old members on the Council, for referring with a feeling of respect and sympathy to one who would be to many now present a stranger.

SALE OF DRUGS IN AUSTRIA-HUNGARY.

The PRESIDENT read a letter from the Privy Council, forwarding copy of a letter which the Foreign Office had transmitted to the Privy Council, with copies of the regulations for the sale of pharmaceutical drugs in Austria-Hungary, and asking to be furnished with any similar regulations which might be in force in the United Kingdom. Accompanying this letter was a copy of the regulations in question, and an intimation that the Lord President proposed to send to the Foreign Office, for the information of the Austro-Hungarian Government a copy of the Register of the Pharmaceutical Society, which, it was presumed, contained all the regulations in force relating to the sale of drugs in Great Britain, and asking for a copy of the latest edition of the Register.

The PRESIDENT said this request would be complied with. Different bodies throughout Europe already had their regulations, and of course they were glad to give any assistance in such matters.

The PRESIDENT also read a letter from the Deputy-Coroner for North Derbyshire, to the effect that he had sent to the Privy Council a recommendation that carbolic acid be added to the list of scheduled poisons. The President added that the letter would be acknowledged, with an intimation that the Privy Council was the proper authority to be appealed to in the matter.

GENERAL PURPOSES COMMITTEE.

The SECRETARY read the report of this Committee, omitting the legal portion. The Committee had considered the communication from the Medical Council received last month, and recommended that the following gentlemen be appointed a committee to carry out the work in connection with the new edition of the Pharmacopœia:—The President, Vice-President, Dr. Inglis Clark, Professor Greenish, Messrs. Ekin, Walter Hills, Martin, Martindale, and Charles Umney; Professor Greenish to be requested to act as Secretary of the Committee. The PRESIDENT reported that he had invited Mr. Peter Squire to join the Committee, but owing to pressure of work he was unable to allow himself to be nominated. A case of alleged personation at one of the examinations in Scotland had been reported, and the Committee recommended that the matter be left in the hands of the President to take such action as he might deem desirable.

The PRESIDENT said he should have to move the adoption of the report later on, but before doing so he might say a word with regard to the appointment of the Pharmacopœia Committee. It would be re-

membered that the President of the Medical Council, Sir Richard Quain, addressed to him a letter which was referred to the Committee for consideration. He had also received a second communication from Sir Richard Quain, expressing his pleasure at what had been done. Although it was a semi-private letter, he thought he might say it was in complimentary terms, encouraging the Council to do what work they could to the best of their ability. The Committee, after careful consideration, felt that, as the first part of the work was the collection of statistics, it was desirable not to have the Committee too large. They consequently appointed the same gentlemen who were appointed the Committee for the preparation of the Addendum to the Pharmacopœia, with the addition of Mr. Walter Hills in the place of the late Mr. Gale. In recommending these gentlemen, the Committee was quite sensible that later on it would be necessary to strengthen them by the addition of a certain number of excellent men from the country, without whose assistance the work could not be said to be complete.

The reference in the report to Mr. Peter Squire would have been noticed. All at that table would feel that a man who had given so much time to Pharmacopœia criticism, and who had spent so much time in experiments in connection with the compilation of his well-known work, ought to be invited to join the Committee, and accordingly he had been so invited. But, as stated in the report of the Committee, he felt unable to allow himself to be nominated, in consequence of the continuous personal work involved in the preparation of the 'Companion.' They would all regret that it was not possible for Mr. Squire to act with this Pharmacopœia Committee, but knowing how much work he had in hand, he could well understand how difficult it would be for him to give the time required for continuous work on such a Committee. He need only add that he hoped this Committee would approach the work in an enthusiastic spirit, and that the result of its efforts and systematic work properly directed, and with the assistance and co-operation of the Medical Council, would be a distinct advance on any previous edition of the British Pharmacopœia.

With reference to the alleged personation case, obviously personation was one of the things with which they should deal, with the view of punishing offenders. One such case was proceeding, as many of them might have noticed; but judgment was not yet given, and the Committee thought it desirable that, as a precaution, the President should be authorised, with the advice of Mr. Morrison, the solicitor, guiding him, to take such steps as the judgment might possibly make it desirable, though of course any such steps might prove unnecessary.

The Council then went into Committee to consider the legal portion of the report.

On resuming, the report and recommendations were unanimously adopted, and a resolution was passed authorising the Registrar to take proceedings against the persons named.

REPORT OF EXAMINATIONS.

January, 1895.

	Candidates.		
	Examined.	Passed.	Failed.
England and Wales :—			
Major	34	16	18
Minor	234	82	152
Total	268	98	170

First Examination.

Examined.	Passed.	Failed.
345	158	187

Twenty-seven certificates were received in lieu of the Society's Examination.

FIRST EXAMINATION, RESULTS.

A meeting of the Board of Examiners for England and Wales was held on Tuesday, February 5.

Certificates by approved examining bodies were received from the undermentioned in lieu of the Society's examination :—

Goshawk, Alick Henry	Cheltenham.
McGhie, John Knowles	Liverpool.
Wallis, Sydney Wilson	Marlow.
Williams, Joseph Miles	Blaina.

The report of the College of Preceptors on the examination held on January 8 was received.

Three hundred and forty-five candidates had presented themselves for examination, of whom one hundred and eighty-seven had failed.

The following one hundred and fifty-eight passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students :—

Adams, Ernest Charles	Salford.
Alexander, William	Banff.
Arkle, William	Lancaster.
Arres, William	Edinburgh.
Atterbury, William Richard	Hampton.
Baker, Henry Charles	Lowestoft.
Barker, Sidney Francis	Cambridge.
Baron, Harry	Bacup.
Battershill, Frank Easton	Truro.
Beaton, Gordon	Dufftown.
Benson, Fenwick Alfred	Stockton-on-Tees.
Beresford, Arthur William	Birmingham.
Berry, Edward John	Llanrwst.
Berry, Walter	Halifax.
Blockley, Frederick George	Leicester.
Booker, Charles W. P.	Hertford.
Boon, John Harold	Atherstone.
Boothroyd, Frederick	Huddersfield.
Borthwick, George	Thornhill.
Bowie, John Alexander	Alloa.
Bowman, Edward	Bunkers Hill.
Brown, Neilson	Loanhead.
Burnhall, John William	Uppingham.
Butterworth, Alfred	Stalybridge.
Campbell, William J. F.	Nairn.
Carter, Charles Edward	Bradford.
Christie, James	Ayr.
Clark, John William	Grantham.
Clegg, Thomas Cooper	Hull.
Cleworth, John	Leigh.
Coles, Sydney Geo. Reading	Birmingham.
Cooper, Harry Percival	Wimbledon.
Crooks, Arthur Thomas	St. Helens.
Davies, John Alfred	Hereford.
Day, Victor Moore	Gt. Staughton.
Deacon, Charles Henry	Shipley.
Dring, Tom	Long Sutton.
Dunford, Albert John	Dowlsia.
Fox, Frederick	York.
Gauld, James Edward	Edinburgh.
George, Hugh Benjamin	Flahguard.
Gilmour, David	Edinburgh.
Gowans, James Horal	Belfast.
Gowland, George	Newcastle-on-Tyne.
Graham, Robert	Kirkintilloch.
Grant, George	Grantown.
Gray, Clement	Cambridge.
Green, Frederick Charles	Havant.
Greenwood, Frank	Healey.
Greenwood, Frederic	Skegness.
Grice, William Charles	Nantwich.
Haig, Henry George C.	Edinburgh.
Harrison, Sarah S.	London.
Heaton, Wallace Evans	York.
Hicks, George	Rothsay.
Hill, Lionel Watson	Lincoln.
Hitohen, Clement Farnell	Halifax.
Horton, Alfred James	Maldstone.
Houlton, Jose Leighton	Hull.
Howard, John E.	Grays.
Hughes, Albert Ingman	Beaumaris.
Hughes, Charles James Allen	London.
Hunter, Peter	Haddington.
Hutcheson, James Cameron	Lochee.
Irish, Harry Toozes	Lowestoft.
James, Edward Bourne	Liverpool.
James, Idwal	Porthcawl.
Johnson, Frank Horace	Birmingham.
Jones, David Richard	Bridgend.
Jones, Richard Owen	Clynnog.
Kay, John Hunter	Cumnock.
Keay, R. Ceol	Barrow-in-Furness.
Kendal, John William	Sunderland.
Kinder, John Henry	Manchester.
Lambeth, Herbert	Southampton.
Lancaster, Thomas Edward	Carnforth.
Langburn, Herbert John	Guisborough.
Lawrence, Edmund William	Knaresborough.
Lee, Arthur	Scarborough.
Lee, Henry Outhbert	Skegness.
Lillie, Robert	Gateshead-on-Tyne.
Linnett, Louis John	Sevenoaks.
Lloyd, Margaret Annie	Birmingham.
Loveless, John Henry Frank	Bristol.
Lumley, Harold	New Cross.
Maddox, David Crisp	Skipton-u. Wychwood.
Mallagh, Thomas Henry	Brentwood.
Manfull, Frank	Nottingham.
Marshall, Gerald Arthur	Barrow.
Mayson, Edward	Keewick.
Merry, Edward Lee	Cheltenham.
Millar, Benjamin	Darlington.
Milne, Alexander	Fettercairn.
Milne, W. Farquhar	Aberdeen.
Missen, Frederick James	Cambridge.
Mitchell, William Charles	Fowey.
Morgan, Arthur James	Pwllglas.
Morgan, Richard James	London.
Morris, John	Willington Quay.
Neill, Ernest Alfred	Didsbury.
Newey, Walter	Stechford.
Normansell, John William	Stockport.
Owen, John Edmund	Abergele.
Owen, William Hibbert	Earlestown.
Paris, William	Glasgow.
Paterson, Ernest Livingstone	Woolwich.
Paul, William	Cowdenbeath.
Plumtree, Percy Malin	Southport.
Pratt, Edgar	Lancaster.
Price, Morgan Evan	Aberdare.
Pybus, Frank Whitelock	Kirkby Fleetham.
Rennison, Thomas James W.	Kirkby Stephen.
Rigg, Harold	Lancaster.
Roberts, Alfred Henry	Bath.
Robertshaw, Henry	Burnley.

Robinson, John Newton.....	Stockton-on-Tees.
Rodwell, Henry	Glasgow.
Rome, John Anderson	Kilmarnock.
Ross, David Aird.....	Tain.
Ross, Hugh	Kilmarnock.
Rouse, William Henry Broom.....	Sidcup.
Russell, Henry William.....	Lowestoft.
Ryder, Arthur William.....	Elworth.
Salter, Francis Septimus	London.
Sellers, William Ernest	Nafferton.
Simpson, John Thos. Freebody.....	Oxford.
Simpson, William	Larbert.
Skerrett, Percy William	Newark.
Smart, Harry	Littlehampton.
Smith, Arthur Richard	Milverton.
Smith, Robert W.	Liverpool.
Smith, Walter Leslie	Oldham.
Sprott, Francis Holiday	Maryport.
Steele, Grave Irving	Carlisle.
Stevenson, George	Ardishaig.
Stratton, John Fountaine	Barton Bendish.
Sutherland, Alfred John	Aberdeen.
Taylor, John	Kendal.
Thomas, Edmund Griffith.....	Bangor.
Thompson, James William	Brampton.
Todd, Arthur H.	Belfast.
Todd, John	Cockermouth.
Treener, Joseph Maurice	Cheltenham.
Turner, Ernest Charles	Norwich.
Wadsworth, George Russell.....	Halifax.
Waldby, Harold	Margate.
Walton, Thomas Robert	Cardiff.
White, William Gillies	Berwick-on-Tweed.
Whittaker, Charles Edwin	Manchester.
Whyte, Charles Alexander	Dunblane.
Wilkins, William	Coventry.
Wilson, James Sayburn.....	South Shields.
Wilson, John Mitchell	Irvine.
Wilson, William	Blackburn.
Wilthew, Robert Ernest	Newcastle-on-Tyne.
Woolcock, W. James Uglow.....	Newport.
Wright, Ralph	Prudhoe.
Yeadon, Alfred George	Elgin.

The questions set at this examination were published in the *Pharmaceutical Journal* for January 12, p. 596.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

	Candidates.				Candidates.			
	Exam-ined.	Passed.	Failed.		Exam-ined.	Passed.	Failed.	
Aberdeen	16	5	11	Lancaster	8	6	2	
Aberystwith.....	2	1	1	Leeds	13	6	7	
Birmingham.....	16	7	9	Lincoln	3	2	1	
Brighton	5	1	4	Liverpool	16	6	10	
Bristol	9	2	7	London	38	14	24	
Cambridge	7	4	3	Manchester	28	13	15	
Canterbury	3	1	2	Newcastle-on-T. 13	7	6		
Cardiff	10	5	5	Northampton ..	4	3	1	
Carlisle	11	7	4	Norwich	7	5	2	
Carmarthen	6	1	5	Nottingham.....	10	3	7	
Carnarvon	6	5	1	Oxford	5	2	3	
Cheltenham	3	2	1	Penzance	2	1	1	
Darlington	8	5	3	Peterborough ..	6	2	4	
Dundee	5	2	3	Plymouth	3	1	2	
Edinburgh	26	9	17	Sheffield	2	0	2	
Exeter	1	0	1	Shrewsbury	3	1	2	
Glasgow	21	13	8	Southampton ..	10	3	7	
Hull	7	4	3	Worcester	1	1	0	
Inverness	6	3	3	York	5	5	0	

Proceedings of Societies in London.

ROYAL SOCIETY.

ARGON, A NEW CONSTITUENT OF THE ATMOSPHERE.

The long-expected communication on this subject by Lord Rayleigh and Professor Ramsay at a meeting of the Royal Society, was held on the 31st ult. The theatre of the University of London had been placed at the disposal of the Society by the Senate, as its own rooms in Burlington House would have been totally inadequate to accommodate an assembly which included nearly all the most eminent chemists and physicists of the day. Lord Kelvin, the President, occupied the chair, supported by Lord Rayleigh and Professor Michael Foster, Secretaries.

The abstract which was read by Professor Ramsay, resolved itself into a clear *résumé* of the whole work done on the subject. In a paper read before the Society last year, "On an Anomaly Encountered in Determinations of the Density of Nitrogen Gas," Lord Rayleigh drew attention to the fact that chemically prepared nitrogen is about $\frac{1}{4}$ per cent. lighter than "atmospheric" nitrogen. Subsequently, experiments were made with nitrogen liberated from urea by sodium hypobromite and from ammonium nitrite purified in the cold. These, with nitrogen prepared from nitric oxide, from nitrous oxide, and from ammonium nitrite purified at red heat, constitute the five sources of the chemically prepared nitrogen on which the authors' data are based. The mean of the five numbers, which were closely concordant, was found to be 2.2990. Now, it had been shown in the paper just referred to, that the mean number of "atmospheric" nitrogen prepared by passing air over red hot copper was 2.3103; therefore, when the presence of a new dense constituent in the atmosphere was suspected, this "atmospheric" nitrogen was passed over ignited magnesium, which absorbed the nitrogen, forming magnesium nitride. By the action of water this compound was decomposed, yielding ammonia, from which the nitrogen was liberated by calcium hypobromite and purified in the usual way. The mean number of the nitrogen so prepared was found to be 2.29918, which, as will be seen, differs but little from that of nitrogen "chemically prepared," but considerably from that of the so-called "atmospheric" nitrogen used for its preparation. This last experiment was modified by distilling off the ammonia, collecting in hydrochloric acid, decomposing the concentrated solution of ammonium chloride formed with calcium hypochlorite, and drying the evolved nitrogen. This result confirmed the first—that nitrogen prepared from magnesium nitride, obtained by passing "atmospheric" nitrogen over red hot magnesium, has the density of "chemical" nitrogen directly prepared. It was also shown that the ammonia produced from the magnesium nitride was identical with ordinary ammonia by converting it into ammonium chloride, and titrating with silver nitrate, which had been standardised with pure ammonium chloride.

From these experiments it was concluded that red hot magnesium withdraws from "atmospheric"

nitrogen no other substance than nitrogen capable of forming a basic compound with hydrogen. When the discrepancy in the weights of "atmospheric" and "chemical" nitrogen was first noticed, various attempts were made to account for it by the presence of various impurities. The most probable was hydrogen. However, the fact that the intentional introduction of hydrogen into the heavier gas, which was afterwards treated as before, had no effect upon its weight, negated this idea, and it was finally proved that the difference could not be due to the presence of any impurity. Again, it was obviously possible either that nitrogen existed partly in an allotropic, or partly in a dissociated form; that is to say, a difference existing in its atomic and molecular arrangements by which the comparative lightness of "chemical" nitrogen would be due to dissociation, and the heaviness of atmospheric nitrogen to allotropic condensation.

However, the fact that both kinds of gases when submitted to the action of the electric discharge retained their weights unaltered, was convincing enough that the source of the discrepancy had to be sought elsewhere. The theory of dissociated atoms was still further negated by storing a sample of chemically prepared nitrogen for eight months, when the density showed no change whatever. Had this theory been tenable, one would have expected the dissociated atoms to disappear, thus exhibiting an analogy to ozone.

It therefore appeared certain that one or other of the gases must be a mixture. But it was difficult to see how the one of chemical origin could answer this description, except upon the hypothesis of dissociation which had been already negated. Therefore, the most probable explanation was to admit the presence of another ingredient in air, from which oxygen, moisture, and carbonic anhydride had already been removed. The method universally adopted by which it is decided whether a gas is pure or a mixture, is that of diffusion. That experiment was not conducted at this stage of the research, as it would have been of no assistance in isolating the new constituent of the atmosphere. At a later period, however, when results were obtained sufficiently conclusive of themselves to prove the presence of a previously unknown gas in the air, Graham's method was utilised to prove that the diffusive power of "atmospheric" nitrogen indicated the presence of a gas appreciably heavier than pure nitrogen.

The identity of "phlogisticated air" with the constituent of nitric acid is due to Cavendish, who distinctly raised, and to a certain extent solved, with the crudest of apparatus, the question now brought forward after the lapse of a hundred and ten years (see p. 664). The existence of a second ingredient in the so-called "atmospheric" nitrogen being admitted, various substances were experimented with in order to decide upon the best absorbent of the nitrogen gas and allow of the examination of the residue. Of the substances tried magnesium in the form of ribbon was found to be the most effective, the process being to pass "atmospheric" nitrogen over magnesium heated in a hard

glass tube until all the metal was converted into nitride. In the earliest attempts made to isolate the gas by sparking air with oxygen in the presence of alkali, a Ruhmkorff coil of medium size actuated by five Grove's cells was used. When the mixed gases were in the right proportions, the rate of absorption was about 30 C.c. per hour. Finally, a residue of gas remained which no longer disappeared by combination with oxygen and removal by alkali, and constituted about 1/120th of the air used. That this was not nitrogen was argued from its resistance to the prolonged action of the spark. After repeating this experiment several times and with various modifications, it was concluded that the amount of residue was in direct proportion to the amount of air operated upon. A comparison of the spectrum with the air spectrum also proved that at any rate the residue was not nitrogen.

In the course of early experiments on the withdrawal of nitrogen from air by means of red hot magnesium, a preliminary experiment gave the residue of density, 14.88, when the gas was not passed over, but simply allowed to remain in contact with the magnesium. However, by passing "atmospheric" nitrogen backwards and forwards over the metal, at the same time adopting other precautions, the density was increased to 19.09. On sparking this product mixed with oxygen for several hours, the volume was still further decreased, the density of the remaining gas being calculated for 20.0. After giving full details of the proof of the presence of argon in air by means of atmolysis, Professor Ramsay proceeded to describe the negative experiments which showed that argon was not derived from chemically prepared nitrogen. Considerable difficulty had been experienced in conducting these quantitative negative experiments, and a long time had been required to bring them to a successful conclusion. In several cases argon was found, but only in a fractional amount of that occurring in atmospheric nitrogen, and its presence was mainly accounted for by leakage of apparatus or contamination. To prepare argon on the large scale, air is freed from oxygen by means of red-hot copper, the residue is then passed from a gas-holder through a combustion tube containing copper, which is heated in a furnace to remove any trace of oxygen. The rising gas is then dried and enters a second combustion tube containing magnesium turnings heated to redness. The process is repeated until all the nitrogen is absorbed by the magnesium, and the unabsorbed gas is free from any possible contamination of oxygen, hydrogen, or hydrocarbons.

The density of argon, prepared by means of oxygen and magnesium respectively, has been found to be 19.7 and 20.38. Determinations of the solubility in water of argon prepared by sparking gave 3.94 volumes per 100 of water at 12°. The solubility of the gas prepared by means of magnesium was found to be 4.05 volumes per 100 at 13°.9. The gas is, therefore, about two and a half times as soluble as nitrogen, and possesses approximately the same solubility as oxygen. All attempts to induce this new constituent to combine have as yet failed. It is, in fact, on account of its absolute chemical inertia that the authors have given

it the name of argon. In conclusion, discussing the probable nature of this gas, or mixture of gases, the authors consider that they are justified in concluding that argon is present in the atmosphere. They are inclined to the belief that argon is a monatomic element: for if it were di- or poly-atomic the atoms would acquire no relative motion, even of rotation, a conclusion exceedingly improbable. An important property of argon is the ratio of its specific heat at constant temperature and constant volume, which has been found to be 1.66, and it is claimed that this figure does not allow of the existence of chemical or other kinetic energy, except such as may suffice for the translatory motion of the molecules. The density has been already mentioned as approximately 20.0, and assuming that the molecule is monatomic the atomic weight would be 40. It seems to be probable that argon may prove to be elementary, but whether one element or a mixture of two is yet uncertain.

Mr. W. Crookes, after congratulating the authors upon their valuable paper, described the spectroscopic peculiarities of argon. His paper was illustrated by photographs thrown on the screen and a map in which the spectral lines of sunlight and other sources were accurately figured.

From these it seems that argon gives two distinct spectra—according to the strength of current employed—and therein resembles nitrogen, but the two are readily distinguished, as one nitrogen spectrum shows bands and the other lines, whilst the argon spectrum consists of sharp lines only at a different position upon the scale. Mr. Crookes' remarks were in favour of the hypothesis that argon is a mixture, and in this respect were opposed to those expressed in the next paper.

This was a contribution from Dr. K. Olzewski, Professor of Chemistry in the University of Cracow, whose investigation on the "Liquefaction and Solidification of Argon" caused him to be opposed to the idea that argon is a mixture, since it has a definite melting point, a definite boiling point, and a definite critical temperature and pressure, and because, on compressing the gas in presence of its liquid, pressure remains sensibly constant until all the gas is condensed to liquid. Professor Olzewski reports that by lowering the temperature of the oxygen by slow exhaustion to -190° , argon froze to a crystalline mass resembling ice. On lowering the temperature still further it became white and opaque, and melted when the temperature was raised, the melting point being determined as a mean of four experiments as $-189^{\circ}6$. He also finds that the density of liquid argon at the boiling point (-187°) is much higher than that of oxygen.

Dr. Armstrong, President of the Chemical Society, in the course of his remarks quite admitted the conclusiveness of the evidence for the existence of the new body. At the same time he was of opinion that a good deal of speculation had been indulged in as to its properties, especially as to its inertia, which did not seem compatible with its strong points of resemblance to nitrogen.

Professor Rücker, President of the Physical Society added his congratulations to those of Dr. Armstrong and pointed out the important issues that arise from argon having this particular ratio of specific heat.

After Professor Roberts Austen had made some remarks, Lord Rayleigh made some general observations on the nature of research, and the discussion was concluded by Lord Kelvin.

CHEMISTS' ASSISTANTS' ASSOCIATION.

A meeting was held on Thursday, January 31, when the evening was devoted to the reading of short papers by members. The following papers were read:—

NOTES ON FILTRATION.

BY R. G. GUYER.

The paper dealt with filtration, objects and methods, filtering media and means of expediting filtration. The object of filtration is either to obtain a clear liquid, free from solid matter, or to collect a precipitate. Great skill is required in filtration on the large scale in order to save time and to avoid loss of material by evaporation. Various media are used, as flannel, calico, muslin, paper, etc., calico and muslin being chiefly used for straining, which is an operation preparatory to filtration in which the liquid is obtained free from the greater portion of suspended solid. Flannel bags are largely used for filtering large quantities of material, and considerable skill is required in order to obtain the filtrate clear and bright, and yet to ensure rapid filtration. Filter papers vary very much, but all should be tested for extractive matter, such as iron salts, etc., and this is best done by extraction with acid and alkali and subsequent neutralisation. The chief method of expediting filtration is by use of a vessel, into which the filtrate can be received, and which is rendered vacuum by vacuum pump. The methods of adding powders, such as silica, pumice, charcoal, etc., to preparations requiring filtration were also described.

WHAT SHOULD BE DISPENSED FOR AQ. MENTH.?

BY MR. HEAP.

This question was again raised for discussion, and the author expressed the opinion that aq. menth. pip. should be dispensed, seeing that it is more universally used than aq. menth. virid.

In the discussion which followed, the opinion was generally expressed that the dispenser should be guided by the custom in the particular locality in which the prescription was dispensed, and that to save all ambiguity it was desirable that aq. menth. should be a synonym of aq. menth. pip. in the new pharmacopoeia.

RELATIVE MERITS OF DIFFERENT PILL COATINGS.

BY MR. DYSON.

The author had examined the merits of the following pill coatings with especial regard to their relative solubility. The method employed was to coat a pill containing ferrous sulphate with the par-

tioular coating in question, and then place it in a beaker containing a dilute solution of potassium ferrocyanide at the temperature of the stomach. The following results were obtained:—

With silver leaf coating there was a distinct precipitate after twenty minutes.

With sandarac or tolu varnish the coating cracked at certain places, and at those points, after twenty-five minutes, a precipitate was visible, but only at these points. The pearl coating first cracked and separated, but it was apparent that there was a varnish present underneath the pearl coating, and the precipitate appeared after one and a half hour.

With gelatin coating the gelatin at once began to swell, and a distinct precipitate was observed in one minute. The author therefore advocates the use of gelatin coating, since it is easily applied, is transparent, and dissolves readily. The pills can be coated by the pharmacist himself, and the gelatin solution is best made by adding 3 parts of water to 1 part of best gelatin, and melting in a water bath.

The pearl-coated pills are probably the worst, since they are often dried before coating, and the coating also takes a long time to dissolve.

SOME DISPENSING DIFFICULTIES.

BY G. ROE.

In dispensing the following prescriptions, certain interactions occurred which are described under each prescription. All the prescriptions occurred in actual practice.

R. Tr. ferri perch.	℥ss.
Acid carbol.	℥j.
Acid sulphurous	℥ij.
Aquam ad.	℥viii.
M. ft. garg.	

The dark colour formed on mixing becomes discharged after a short time.

R. Pot. chlor.	gr. v.
Calc. hypophosph.	gr. v.
Magnes. sulph.	gr. x.
Ferri sulph.	gr. ij.
Liq. strychn.	℥ij.
Aq. ad.	℥j.
M. ft. mist.	

Insoluble calcium sulphate and iron hypophosphite are formed.

R. Sodli salicyl.	gr. x.
Am. carb.	gr. ij.
Sp. aeth. nit.	℥xx.
Sp. chlorof.	℥x.
Aq. ad.	℥j.
M. ft. mist.	

Becomes red in a few hours. Mix am. carb. with sp. aeth. nit. first, then add the other ingredients.

R. Pot. brom.	gr. x.
Antipyrin	gr. v.
Tr. ferri. perch.	℥x.
Sp. chlorof.	℥x.
Aq. ad.	℥ss.
M. ft. mist.	

The characteristic red colour is discharged on adding five times the quantity of water.

R. Codein.	gr. ij.
Acid phosph. dil.	qs.
Acid hydrocyan. dil.	℥xx.
Tr. iodi.	℥x.
Aquam ad.	℥iv.
M. ft. mist.	

The brick-red precipitate of alkaloid is dissolved on adding the acid. hydrocyan. dil.

R. Liq. hydrarg. perch.	℥l.
Liq. arsenicalis	℥v.
Sp. chlorof.	℥xv.
Aquam ad.	℥j.
M. ft. mist.	

The alkaline solution of arsenic precipitated the mercury salt. The acid solution was substituted, when a clear solution resulted.

R. Hydrarg. subchlor.	℥ss.
Liq. calc. sacch.	℥j.
M. ft. lotio.	

To be added to each pint of water.

This was necessary because the patient required a large quantity of lotion. The decomposition appeared to be the same as in the case of lot. hydrarg. subchloridi, although after some weeks the dark precipitate began to get lighter in colour.

Now while it may be possible to use the saccharated solution of lime for the above, it becomes quite another thing when it is added in a diluted form to mercuric chloride, because in this case, providing the lime solution is added gradually, only the red oxide is precipitated, whereas if the solution of lime be added to the finely powdered mercuric chloride quickly, little, if any, precipitate results; in fact, should a solution of the mercury salt in glycerin and water (grs. v. to ℥l.) be used, and then the diluted liq. calc. sacch. added all at once, the solution remains quite clear, but will deposit a blackish precipitate after a few hours.

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PLYMOUTH, DEVONPORT, STONEHOUSE, AND DISTRICT CHEMISTS' ASSOCIATION.

JUNIOR SECTION.

A meeting of the above was held at the Foresters' Hall, Octagon, on Thursday, January 31, among those present being Mr. C. J. Park (President), in the chair, R. F. Roper (Senior Section), Dewdney, Buckner, Barber, Venn, Darke, and O. H. Westcott (hon. sec.). A letter was read from Mr. E. H. Newman resigning his position as junior chairman on leaving the town. The resignation was accepted with regret. The following paper was then read:—

PHARMACY—REAL AND IDEAL.

BY HERBERT A. HODGE.

"Comparisons are odious," and especially are they so to those who advocate and promote a system or state of affairs which, when weighed in the balances, is found wanting, and therefore must take the lower level. Pharmacy as a "profession" in this country has advanced in no little degree with regard to its educational requirements of those who would enter its fraternal circle and the commendable process of "sift-

ing" still goes on with great activity at the headquarters in Bloomsbury Square. On the other hand, pharmacy as a "trade" seems to offer a paradox, in that it appears to be slowly but surely advancing—backwards. Not that the pharmacist is slowly sinking to a lower footing in the hive of Society, or that those who are just entering the business have less advantages than their predecessors, but one by one the very principles and processes which constitute the practice of pharmacy, fail, perforce of circumstances, to find a place in the every-day routine of a chemist's business. To illustrate; taking the preparations of the British Pharmacopœia, the guide and standard of the pharmacist wherever he may be, how many of the tinctures, liquors, infusions, extracts, etc., therein enumerated, are actually made by the individual business man? How much of his time is occupied in real practical pharmacy? Circumstances have altered cases truly, and the outcome of progress has been the dividing of real pharmacy between the "manufacturer" and the "retailer."

With the bulk of the pharmacists of to-day the question is entirely, from a trade point of view, "How best to keep pace with the times?" Time is money, for the most devoted student and highest educationist must acknowledge that even the "mere dross of this world" is useful at times. Concentration is the order of the day. Space being precious, the need for a more compact method of stocking drugs is supplied by concentrating liquids into one-eighth and one-twentieth of their bulk, and compressing solids into tablet form. The old-fashioned bolus is replaced by the elegant little sugar-coated granule, and the most fastidious of the public may have no bitter pill to swallow. Could a few of our ancestors drop into one of our most modern pharmacies, what a metamorphosis they would find! To see the manipulator at the dispensing counter, the dispatch and style in which the mixture is put up, the coating of pills with sugar, gelatin, keratin, or varnish, the powders being put into cachets and so on, it would be difficult for them to realise that they were really in the modern edition of their ancient dispensaries.

The pharmacy of yesterday, to-day, and to-morrow may differ widely in detail, but the fundamental principles of its study are the same throughout. The methods of our forefathers may appear crude to our latter-day ideas, but they were adapted to and sufficient for the times in which they lived. So the pharmacist of our own time, aided by the journals of pharmacy, which week by week bring before him suggestions and experiences of his fellow-workers, keeps abreast of the times and adapts himself to the circumstances. On pharmacy in the "real"—as it is, most of us will agree that it might be better; in the "ideal"—as it should be, opinions will greatly differ.

One individual's ideal state of pharmacy may be quite contrary to that of another, and the ways and means adopted by one class of pharmacists to reach the "ideal" might be utterly distasteful to the other. All agree, no doubt, that the chemist is and should be the legitimate dispenser, but on the methods to be used to make it

un fait accompli chemists themselves seem to disagree. We hear of suggestions for the better consolidation of those engaged in pharmacy in which the ideal is prominent, but the ways to get at it are diverse. Of course combination of forces exerts the greater pressure, so in matters of pharmaceutical legislation a united effort on the part of the parent Society and kindred local societies would bring about greater success to pharmacy as a whole.

Practical pharmacy is the main study in the training of the chemist, to which the studies of chemistry, botany, and materia medica come as useful adjuncts in enabling him to become a thoroughly all-round man. It is important to enforce upon the minds of the junior members the necessity of obtaining and retaining all the advantages for study during their apprenticeship, as they will all help them on in their career.

To the man in business "Pharmacy up-to-date" is no burlesque, it is stern reality. Competition is a universal feature, and to him pharmacy as it really is must be far from ideal. The "possibilities" of pharmacy are unlimited, but the "probabilities" of the same are somewhat veiled until we know what steps our leaders are taking towards the betterment of our class as traders. As a profession—a class of men who undergo examination—monopoly should be the reward of the pharmacist, not in the mere selling of poisons only, but in everything pertaining to the importation and preparation of drugs and their compounds. It may seem early to dream of monopolies, but impracticability is not out of the question where ideas coincide. It follows, then, that to reach an "ideal," of whatever kind it may be, ambition combined with effort is essential in the individual. Combination of individuals will form an association, and combination of associations will form a body both influential and representative. When the pharmacists of our country realise to the fullest extent that "union is strength" then that point will be reached in the position of pharmacy where the "real" merges into the "ideal."

Mr. C. J. Park said that in reviewing pharmacy as it existed in this country, it pointed much towards the survival of the fittest, seeing that the conditions required of those who enter it were not so stringent as in other countries; he did not think a good all-round man would ever find much difficulty in making some headway in his profession, and advised the junior members to persevere in their studies.

Mr. R. F. Roper, whilst agreeing in the main with the views expressed in the paper, could not see how any form of monopoly in the drug trade could be brought about to suit all concerned, the progress of pharmacy depended greatly on the rising pharmacist's apprentices and assistants of to-day, who were under much better conditions than those of former years.

Messrs. Westcott and Dewdney, in the course of their remarks, endorsed the remarks of the previous speakers.

On the motion of Mr. Westcott, seconded by Mr. Dewdney, a vote of thanks was unanimously passed, also to the Chairman for presiding.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

At the meeting on Wednesday, January 30, Mr. Alex. Sutherland, President, in the chair, a debate took place on the question—

SHOULD THE SCOPE OF THE PRELIMINARY EXAMINATION BE EXTENDED?

Mr. George Coull in opening the affirmative side said, on May 11, 1841, at the introductory pharmaceutical meeting of the Pharmaceutical Society of Great Britain, a paper was read by Jacob Bell in which he contrasts the position occupied by those who follow pharmacy in Great Britain with that held in other countries, and especially in France and Germany. He shows up our deficiencies, and emphasises the need for education in comparison with the men of scientific acquirements and education who practise pharmacy in France. The paper is explanatory of the objects the founders had in establishing the Pharmaceutical Society. The first one is union of the chemists into one recognised independent body; second, protection of their general interests; and third, the advancement of the art and science of pharmacy. They consider (to use his own words) that their own interest, as well the safety and welfare of the public, demand that no person shall become an apprentice in their business who has not had the advantage of an adequate fundamental education. This shows how these men, the fathers and grandfathers of pharmacy as it is now, saw the necessity for an adequate preliminary education of all those who contemplated pharmacy as a means of livelihood. This subject of education permeates all their actions and sayings and the actions of their successors in the Council even to the present day, besides being the theme of numerous editorial notes, of many addresses by men whose names will live in pharmacy for ever, and of much correspondence in the *Pharmaceutical Journal* from that day to this.

The Royal Charter of Incorporation was granted on February 18, 1843, to William Allen and divers others of Her Majesty's loving subjects for the purpose (among others) of promoting an uniform system of education of those who should practise pharmacy. The Act of 1852 was a purely educational statute. The Act of 1868 is sometimes contemptuously termed a "mere poisons Act," but it inaugurated a new pharmaceutical era in making it compulsory for those assuming the title of chemist or druggist to have competent skill and knowledge and qualification; that is, to be adequately educated. The question now to be considered is what constitutes an adequate fundamental education, and this question must be treated as a progressive one. It is obvious that what was thought to be sufficient over fifty years ago will not satisfy our requirements now; more especially as the examination was then a voluntary one, and it was, therefore, deemed inadvisable to make it too difficult in order that candidates might not be deterred from coming forward. From an edi-

torial note on the classical examination in the *Journal* for January 1, 1848, we are informed that the Council do not think it expedient to raise the standard too high in the first examination. The examination then comprised a knowledge of Latin, sufficient to translate the Pharmacopoeia and physicians' prescriptions, and of the simple rules of arithmetic. The editor hopes that it will in process of time be found practicable and expedient to extend the course of study required for this examination, feeling persuaded that an elementary acquaintance with physics and mathematics is of great importance, and that some knowledge of the modern languages might be added with advantage. He concludes, however, that this will be subject for consideration when the examination is enforced by Act of Parliament. Again, in an article, August 1, 1857, the opinion is repeated that a knowledge of the above subjects would be advantageous, and, furthermore, parents are advised not to limit the academical instruction of their sons to what is absolutely required for this examination.

From this it is evident that at that time even as at the present there were those whose only thought was how little do I require to know in order to pass. In October, 1888, when I had the honour of addressing this Association from the presidential chair, I advocated reorganisation of the Preliminary examination, increased stringency, and its scope widened by the introduction of elementary mathematics and French or German, giving reasons for adding these. I need scarcely recall to your minds the vigorous article by Mr. J. E. Saul, a member of the London examining board, in the *Journal* for April 4, 1891. The language of Mr. Saul was rather strong at times, and while agreeing with him in most of his statements, I think he was rather hard on the minor candidates. This article was productive of a vast amount of correspondence on the subject, and elicited an almost complete consensus of opinion that the time had now arrived when the scope of the Preliminary should be widened. Following came the discussion on the Preliminary examination by the London Chemists' Assistants' Association, when a motion was unanimously carried that the Preliminary should offer a better test of a youth's general education and ability. And yet we stand almost where we were when the suggestion of increasing the scope of the examination was made in January, 1848, and it was stated it would be subject for consideration when the examination was enforced by Act of Parliament. This examination was enforced by Act of Parliament in 1868, and the opportunity of making it a real test of a fairly good education was allowed to slip, a thing, I opine, which would not have occurred had Jacob Bell been living at that time. The new regulations altered the Latin required to the first book of 'Caesar's Gallic War,' and added a knowledge of English, and of vulgar and decimal fractions. Lately we have had an addition to the schedule of numeration, the metric system, percentages, stocks, etc., with the first book of Virgil's 'Æneid' as an option to Caesar, and—there we are.

I have tried, and succeeded very imperfectly, to give

a historical sketch of the Preliminary examination, and to show that it has been the idea from the beginning to insist upon a certain educational standard, and to gradually raise that standard. Why that was not done in 1868 is a great mystery. I think I once heard that there was something in the Charter or the Acts that prevents this being done. While acquainted with the subtle meanings that can sometimes be extracted from Acts of Parliament, I yet think the matter is plain enough. Charter, line 93: "... and such associates, apprentices, and students shall first be duly examined in such manner as the Council of said Society shall deem proper." Pharmacy Act, 1852, section ii., gives the Council power to alter the bye-laws after certain formalities have been gone through. Section viii. mentions the subjects of examinations, "Latin language, botany, materia medica, and pharmaceutical and general chemistry, and such other subjects as may from time to time be determined by the bye-laws." As to the necessity for increasing the scope of the examination, and the advantages that would accrue from so doing, what can I add to what has been already said?

Speaking generally, a more rigid test of the capabilities of candidates for admission to our ranks would exclude some whose retiral from pharmacy would be advantageous to all. It is by education alone that we can raise the status of the trade, and with that will come naturally increased remuneration for our services. Speaking specifically, I can only repeat what I said before when I advocated the same cause I am addressing you about now. That nowadays even an elementary knowledge of mathematics is of great advantage to the student of chemistry, while for the proper understanding of physics it is absolutely essential. In order to read intelligently a text-book on modern chemistry one must know a great many things that were not deemed necessary not so long ago, while a knowledge of German, though elementary, is of great importance. As to the precise form the extended examination should take, it is time to offer opinions when we see the matter properly under weigh. I think a recommendation for the student in Scotland to obtain the leaving certificates of the Scottish Education Department would be attended with good results. Another idea is to vary the Latin authors prescribed (giving due notice, of course), so that a youth may not get up the whole book, and repeat any portion—parrot-like—when he gets a cue—a thing that has actually been done. I can only say that, *ceteris paribus*, it is the educated man who succeeds best in this vale of tears. I leave the case here, and I hope, for the honour of the Association, that my views will prevail.

Mr. J. McIntosh Cameron, in moving the negative, said: The subject under discussion is one which merits the serious consideration of every one of us. The question is full of difficulties, and is one on which we should not pass our final opinion till we have thoroughly exhausted the arguments to be brought forward on both sides. Mr. Coull has shown us the advantages. It will be my endeavour to point out the evident disadvantages which would

arise from an extension of the Preliminary subjects. One of the greatest disadvantages would be that an ordinary youth having left school at the age of 15 or 16 would either waste a year of his apprenticeship in getting up the additional subjects, or it would be necessary for him to undergo a special course of study for at least a twelvemonth to prepare those subjects, a knowledge of which it is almost impossible to obtain in an ordinary school. Take the suggested subjects. What time is there between the age of 9 and 15 for anyone to obtain a fundamental knowledge of these subjects? The result of their introduction would be that at the very commencement of his career he would undergo a process of cramming in acquiring a smattering knowledge of at least two subjects—a lack of the fundamental principles of which would place him on an artificial foundation.

He would then commence his training for a profession with his mind full of a lot of nothings and a small amount of somethings, which might in after life prove a curse rather than a blessing. What chemist of the old school can look upon his assistants of the present day without regret when he contemplates the process of cramming to be undergone for the all-important Minor? Then why add to the Preliminary subjects which would necessitate the introduction of this process at the opening of each apprentice's career? Do the advantages counterbalance the disadvantages? One of the principal advantages is supposed to be that a more highly educated class of men would be introduced into the so-called profession. What would be the result? They would probably be too high and mighty for their ordinary duties. A special staff would have to be engaged for such duties as the taking down of shutters, cleaning windows, sweeping floors, swabbing greasy ointment slabs, dusting bottles, and a thousand and one little items which are considered to be all important in the education of the apprentice of to-day. The apprentice of the future would be displaying always a maximum of shirt-front and a minimum of that knowledge essential in the carrying on of an ordinary pharmacy.

We then would be looked upon as the old standard of chemist is looked upon now by some—a hindrance to the profession; when, truth to tell, they are really the ornaments thereof. Speaking generally, the ornaments of our profession are the men of the old school, whose whole time was spent in obtaining a thorough acquaintance with practical pharmacy, rather than hunting for outside knowledge which would be of no material benefit to them in after life. Let us do away, once and for all, with that cant and humbug on the subject of higher education which has of late years been so conspicuous. Let us have more time taken up with the consideration of how rather to fit present pharmacy to the requirements of the pharmacist of to-day, rather than straining so far into the future and trying to fit the pharmacist of the third and fourth generation for that pharmaceutical position which may never be attained. What does the future offer to those men possessed of a standard of education fitting them for a class in society which the remuneration from their profession

will not permit them to move in? They would become discontented with their lot and seek the earliest opportunity of entering an allied profession which would offer higher remuneration and greater social advantages.

Let us consider the results of the examination as it stands at present. If it is the desire of those anxious for a higher code to debar by this means an excess of successful candidates, surely the present percentage of failures quite justifies my argument that the examination is severe enough. Which of us, on entering for the Preliminary, did not consider it, at that time, a sufficient test of our ability? If there must be a change, rather let it be in the time appointed for the passing of the examination. Make it compulsory for everyone, before starting apprenticeship, to pass the Preliminary, and thus allow him to devote all the spare moments of his apprenticeship to obtaining a gradual knowledge of the subjects necessary for the Minor. To keep the student in touch with his studies and give him a stimulus for future work introduce an Intermediate examination, so that the present gap between the Preliminary and the Minor would be done away with. The days of apprenticeship would thus become one continuous course of study rather than a period of little or no study followed by a terrific grind extending from three to an indefinite number of months, according to the luck of the candidate. It is a thorough intimacy with pharmacy which we as pharmacists require, not a general knowledge of a variety of subjects which are doubtless very useful in their own way. Therefore we should seek to regulate the examinations so that youths immediately on entering their apprenticeship may be compelled to seek after a knowledge of those subjects which are the essentials in the building up of a modern pharmacist.

Mr. Swanson seconded the affirmative and Mr. Thwaites seconded the negative, and the debate was continued by Messrs. Burns, Hill, Macpherson, McEwan, and Sutherland.

After the replies by Messrs. Cameron and Coull, a vote was taken, and the affirmative was carried by a majority of two to one.

A circular from the Federation of Associations' Committee was remitted to the Committee with powers.

Mr. McEwan gave an interesting sketch of the history of the Association prize scheme, and the following note was then read.

CHROMIC ACID AND COCAINE HYDROCHLORATE.

BY JAMES MCRAIN.

Recently the following prescription was handed to me to be dispensed.

R. Acid. Chromic. grs. iv.
Cocain. Hydrochlor. grs. vii.
Aque ℥iij.
Solve.

The acid was dissolved in ℥i. of water, and the cocaine hydrochlorate in the other ℥i. of water. On mixing the two solutions the whole became thick from the separation of an orange-yellow precipitate. The action seems similar to that of the U.S. Phar-

macopœia test, in which, on adding 5 C.c. of a 5 per cent. solution of chromic acid to 5 C.c. of a 2 per cent. solution of cocaine hydrochlorate, a yellow precipitate is produced, which re-dissolves on shaking, and again separates as a permanent precipitate on the addition of 1 C.c. of hydrochloric acid. In this case the precipitate did not re-dissolve on shaking, and the alkaloidal salt on examination was found to be slightly acid. On applying to the prescriber, he said the cocaine could be omitted, as it was intended to mitigate the pain produced by chromic acid applied as a caustic.

Mr. Hill said this was somewhat analogous to the use of cocaine along with nitric acid. Perhaps the object of the prescriber could have been attained by applying a solution of cocaine first, and after giving time for the production of local anæsthesia applying the chromic acid solution.

On the motion of the Chairman, a hearty vote of thanks was awarded to the authors of papers, and the meeting then closed.

Correspondence.

"TABLOIDS" AND THE NEW BRITISH PHARMACOPŒIA.

Sir,—In your contemporary, the *British Medical Journal* of February 2, a writer on pharmacology uses laudatory language in regard to compressed "tabloids," and says "it would be useful to have something of this sort" "in the new edition of the Pharmacopœia" (see *Pharm. Journ.*, p. 664). Can the writer be aware that the word "tabloid" is a registered trade-mark of a firm of Americans, who can claim neither originality nor superior excellence for the manufacture of medicines compressed into this form, English houses having been makers of these for nearly fifty years to my knowledge? Is the English word "tablet" or its Latin equivalent not expressive enough, that we need to have a word coined which is a hybrid of Latin and Greek? The use of even the word "tablet" was challenged by them. The way in which prescribers are led by the nose by the advertisements of monopolists, who assume to themselves the right to influence the mode of medical prescribing, is intolerable, as we cannot dispense a compressed tablet of antipyrine if it has been prescribed as a "tabloid" without interfering with the trade-marks of two foreign firms, if we give anything but that of the manufacture of one and the compressing of the other. To give an instance; in my pharmacy to-day (Feb. 4) a prescription ordering "tabloids"—not in stock—of a drug wanted immediately, was presented. On sending post-haste to the firm referred to above, I learnt such tabloids had never been prepared by them; another maker's "tablets" had, therefore, to be supplied. This instance is not solitary.

From a writer of such eminence as Dr. Lauder Brunton might we not expect less tendency to quackery, or rather monopoly, and a closer adherence to our mother tongue than is shown in using the word "tabloid" in place of "tablet"? We have "antifebrin," "phenazone," and "lanoline" admitted into the Pharmacopœia. I trust the Medical Council will be more watchful of British interests than to admit a further series of these preparations manufactured under patents and vended under trade-marks, else there will be a greater protest than there has been from home manufacturers. Again, the writer I have referred to says the British Pharmacopœia is primarily in-

tended for the use of the medical man. "It is a work issued by the General Medical Council as a standard and guide to the members of the medical profession, and only secondarily to chemists and pharmacists. This is seen by the fact that the latter have no direct voice in the preparation of the Pharmacopoeia, and have only been called in to give advice when required." Is this the fact? If the medical man, instead of having his prescription dispensed by the chemist, supplies his own medicines, he may prepare them as he likes. It is only when he writes a prescription that the necessity of a pharmacopoeia becomes apparent. If we accept the position of being the physician's cook we may claim at least to be the joint compilers of the cookery book. If he selects the dishes we must, if we have to follow his orders, direct how they are to be prepared. It is time that pharmacists in Great Britain struck for that conjoint right which they possess in most civilised countries.

GALEN.

THE MANCHESTER MEETING.

SIR,—I shall be pleased if you will allow me space to draw more attention to an important resolution passed at our Manchester meeting on the 23rd ult. than is likely to have been attracted thereto by your necessarily condensed report. The resolution dealt with the question of unrestricted equality on the Council of the Pharmaceutical Society, and was intended as an indication to the Council that the proposal of last year respecting the number of chemist and druggist members on the Council was not approved by the subscribers to the Society. This is, I believe, the first time that this point has been raised in a large and representative meeting of the trade, and the most pleasing feature in connection therewith, and one deserving of special note, is that the mover, seconder, and supporter of the resolution are all Pharmaceutical Councilors, the last having been a student contemporary with Mr. Carteighe. That this resolution was carried without a dissentient voice is a fact that should weigh with our esteemed members of the Council in future attempts at legislation. I would add that with one solitary exception every Pharmaceutical Councilor with whom I have discussed this question during the past month has approved most heartily of the suggestion to remove this one single obstacle to a united Society, a Society having one qualification and no disabilities.

Manchester.

HARRY KEMP.

Sir,—I had hoped some abler pen than mine would have been wielded in support of the President's remarks at Manchester, and am much surprised and disappointed at the small amount of criticism and controversy his address has evoked. It may be that we are all so much in accord with Mr. Carteighe's contentions that we do not feel called upon to say anything pro or con. But if that be the case his trouble in giving his address would amount to little more than expression of personal opinion, and the chief object of its delivery would remain unachieved. I gather from the President's remarks that we are in search of some method of improving the status of chemists as a class, and of making it possible for them to earn a living by the exercise of their legitimate calling; that these desirable ends can only be arrived at by approaching Parliament, and that to do this successfully we must be united and present a bold front. How is this union to be brought about? I, personally, think there ought to be sufficient *esprit de corps* in every man who voluntarily adopts a calling to induce him (without any consideration of £ s. d.) to rally round its standard

and do his level best for the general weal. Unfortunately our calling seems to be an exception to this salutary proposition. The majority are either lukewarm and stand aloof, or they are in more or less active opposition. Minor men are said to grumble because they are not admitted to membership, and the existing chemist and druggist members because they are not sufficiently represented on the Council. As a pharmaceutical member I say admit to membership all who pass the qualifying examination, and remove the restriction on the number of chemist and druggist members eligible to sit on the Council if this will satisfy the outsiders and induce them to join the Society. I don't think the pharmaceutical chemist members would object to this, provided it was the means of attaining the desired result. A few might think it would destroy the distinction in the eyes of the public between the Major and Minor qualification; perhaps to some extent it would, but, for myself, I am willing to risk that. I think it a great pity that Major men have not cultivated the title pharmacist in preference to that of pharmaceutical chemist; it is one of the titles distinctly reserved by the Pharmacy Act to Major examinees, and its use since 1868 would long before this have educated the public to recognise two classes of dispenser of medicines, the pharmacist and the chemist; instead of which, we usually find the former title used in its generic, instead of its specific sense, and applied to the whole craft, instead of a comparatively small section of it. There are many other important points in the President's admirable address one might dilate upon; but these questions of membership and of representation on the Council seem to be the fundamental difficulties. With these out of the way we may get into line, so to speak, become unanimous in the conviction that we want something, arrange later on what that something shall be, and then work unitedly to make that something an accomplished fact.

St. Mary's Pharmacy, Manchester. CHAS. SWINN.

A SUGGESTION.

Sir,—It has often struck me that the public are not sufficiently reminded of the "why and the wherefore" of our position as an exclusive trade. May I throw out as a useful suggestion that chemists should keep conspicuously in their windows and elsewhere the preamble of the Pharmacy Act, 1868—"Whereas it is expedient for the safety of the public, &c.," appending thereto a copy of their certificate of examination, which is of much too modest a character. If some enterprising printer took up the idea there is money in it.

202, Caledonian Road, N.

E. WARRELL.

DIASTASIC OR DIASTATIC?

Sir,—As you are aware the expressions "diastasic" and "diastatic" are both in use among chemists, the latter being the more common. I have been kindly granted a conjoint opinion of the Professor of Chemistry and the Professor of Greek in Edinburgh University, that the more correct form is "diastatic."

Edinburgh.

D. B. DOTT.

Answers to Correspondents.

W. A. Roberts.—You will find Maisch's work very suitable for your purpose, and as reliable as any work of its class.

COMMUNICATIONS received from Messrs. Austen, Bayley, Cocks, Coleman, Cross, Dott, Hill, Kemp, Kirkby, Line, Messter, Mitchell, Nicholson, Perry, Roberts, Swinn, Wellcome, Wootton.

THE HISTOLOG OF IPECACUANHA.

BY HENRY G. GREENISH.

Professor of Materia Medica to the Pharmaceutical Society of Great Britain.

The ipecacuanha plant, *Cephaelis ipecacuanha*, is described by Martius* as producing a perennial root, simple or divided into a few divergent branches, which enter the earth obliquely, are winding, 4 to 6 inches long, rarely longer, and mostly narrowed a little at base and apex. The stem exhibits a disposition to bend downwards and creep along the ground; here and there it is nodose, and at the nodes it produces roots.

This description agrees well with the appearance of the drug received from Brazil, and from a consideration of the habit of the plant and the manner in which the root is collected it is evident that we must expect to find in the commercial drug, which should consist of root alone, portions of both prostrate and erect stem. As a matter of fact, almost

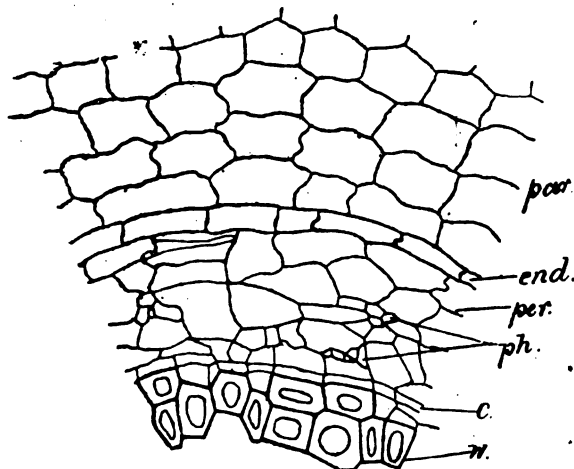


Fig. I.—Ipecacuanha; Young Brazilian Root.
Trans. S. x500.

every bag of Brazilian ipecacuanha that reaches the London market contains both prostrate and erect stem mixed with the root in varying proportion; it is even by no means uncommon to see bags of the drug consisting almost entirely of stem.

The root is usually dark brown in colour; occasionally it is brick red; in this case the colour is partially removable by washing, and is due partly at least to adhering particles of red earth. When well developed, the root is characterised by marked transverse annulations; under a lens the transverse section exhibits a slender wood surrounded by a thick mealy or horny cortex.

The erect stem is paler in colour, uniform in thickness, and longitudinally striated. Its section shows a comparatively thin cortex and a wood enclosing an oval or rounded pith. The prostrate stem is frequently intermediate in appearance between root and erect stem; the colour is sometimes dark and the surface rough.

In the very young root the stele is diarch or, according to Holfert,† sometimes triarch. The pericycle consists of a single layer of cells, and is

separated by a well-marked endodermis from the extra-stelar parenchyma, which usually numbers about four rows of cells. The primary phloems groups are small, and the primary xylem consists of tracheides. All the cells of the central conjunctive tissue subsequently develop also into tracheides, so that in mature roots there is no trace of pith. During the further growth of the root a phellogen forms in the pericycle (Fig. I.), which now appears to consist of two rows of cells, and the whole of the extra-stelar parenchyma, including the endodermis which has then collapsed, is thrown off. A rapid development of parenchymatous tissue now takes place, largely by division of the parenchymatous cells of the medullary rays in the secondary bark. The tissue so produced may remain comparatively limited in extent, in which case the root retains

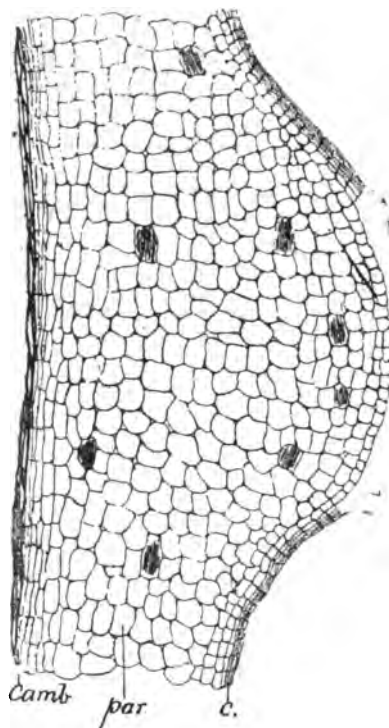


Fig. II.—Ipecacuanha; Young Brazilian Root.
R.S. x60.

its fibrous character. Such fibres may be found in the ipecacuanha of commerce, although being easily broken, the majority of them are probably lost; occasionally they form a considerable portion of the drug. On the other hand, the parenchyma may increase considerably in thickness, and this it frequently does locally, at points where rootlets have been attached (Fig. II.). In this manner a swelling is developed on one side of the root. Usually a number of such swellings are produced in close proximity to one another and occupying the same position as the rootlets; in a diarch root, therefore, on alternate sides of the root or in a triarch root in the form of a spiral. In this way the annulations of the root are eventually produced. Careful examination of a well-developed root will show that these annulations are not strictly discs, but

* 'Spec. Mat. Med. Bras.', p. 4.

† Archiv. d. Pharm., cccxvii., 493.

rather slightly elliptical wedges, the wood occupying approximately the position of the axis of the thinner ends of the wedges; the latter almost invariably alternate with the thicker ends in which traces of the rootlets can be found.

If a transverse section of a well-developed root be examined under the microscope the whole of the cortical parenchyma and many cells in the wood will be found to be filled with starch grains. These can be removed by clearing and the following structure can then be observed :—

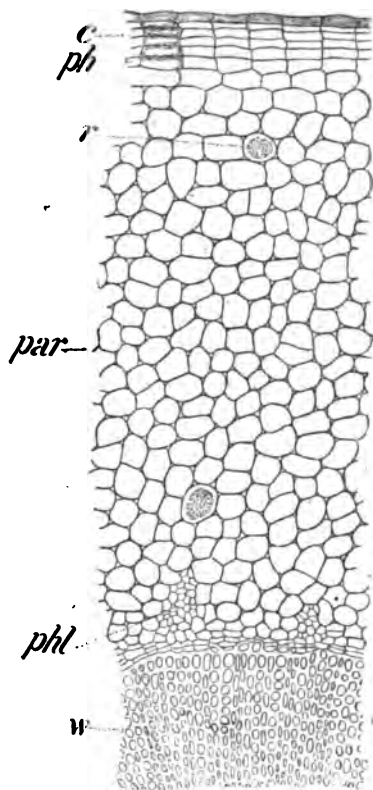


Fig. III. Ipecacuanha; Brazilian Root. Trans. Sect. (Tschirch).

The tegumentary tissue (Fig. III., c.) consists of several rows of thin flattened cork cells containing a brown granular substance to which the normal dark brown colour of the root is due. The cork cells of the red root contain a similar colouring matter. Viewed from the surface they exhibit an irregular polygonal outline (Fig., IX. p'); they are produced by a single phellogen layer formed from the cells of the pericycle.

The parenchymatous tissue that follows the cork consists of rounded or polygonal, frequently axially, elongated cells with few intercellular spaces; here and there a cell filled with raphides is conspicuous; mucilage, in which such raphides are often embedded, I have not been able to detect. This parenchyma is developed partly from the pericycle, partly from the medullary rays of the secondary bark into which tissue it passes without any visible line of demarcation. The phloem forms wedge-shaped groups of cells, the apex of the wedge directed of course, towards the cork. They

are not conspicuous, but may be detected by the small size of the cells and the irregularity of their walls. In the phloem parenchyma raphides are frequently found.

The wood consists entirely of small elements. The medullary rays are not conspicuous, all the cells of the wood showing about the same radial elongation. If, however, a fresh section is stained with iodine, more or less regular radiating lines of cells containing starch can be distinguished; these lines of cells undoubtedly correspond to, and perform the function of, medullary rays. A tangential section shows that the cells of which they are composed are much axially elongated, and not strikingly different from the rest of the tissue.

After separation by one of the usual methods into its constituent elements, the wood, including the medullary rays, will be found to consist principally of two forms of cells (Fig. V.). On the one hand tracheides (tr.) with more or less pointed ends, and consequently oblique transverse walls, in which a perforation is commonly to be seen. In these tracheides the pores are usually oval, right, or sometimes left, oblique and areolated (compare

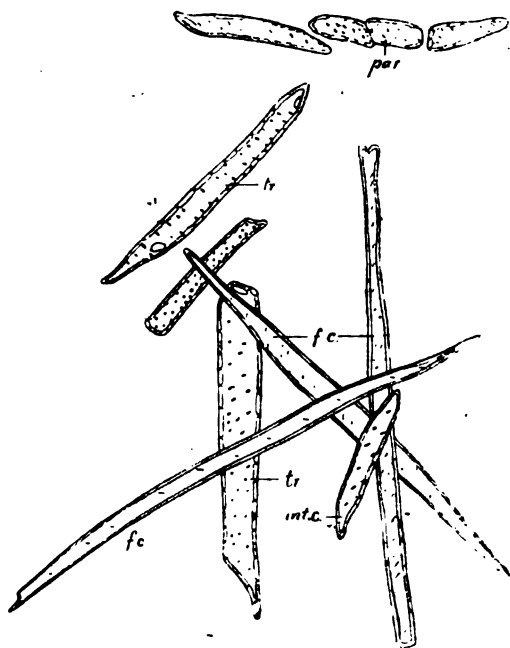


Fig. V.—Ipecacuanha; Elements of Brazilian Root-wood. x160.

Fig. VIII., tr.). Such perforated tracheides are not confined to this drug; they have been recently figured and described by Boodle and Worsdell* from *Casuarina*, *Carpinus*, and *Gnetum*.

On the other hand, fibrous cells (f. c.) are frequent; in these the pores, which are usually right oblique, are less numerous and not areolated. Practically they differ from ordinary wood fibres only in their pores and in the fact that they contain starch, and hence are not solely mechanical in their function. True wood fibres have left oblique pores and never con-

* 'Comparative Anatomy of the Casuarinæ.' (Annals of Botany, viii., 231.)

tain starch. In addition to these two cell forms, true wood parenchyma cells (*par.*) can be found, as well as intermediate forms, such as Sanio's "ersatzfaserzellen," which Professor Vines translates "intermediate cells (*int. c.*)." True vessels are invariably absent.

A tangential section shows that the tracheides are the only elements free from starch; the medullary rays are seldom well defined, the elements of which they consist usually exhibiting strong axial elongation (compare Fig. VIII).

The starch grains (Fig. VI.) are mostly compound.

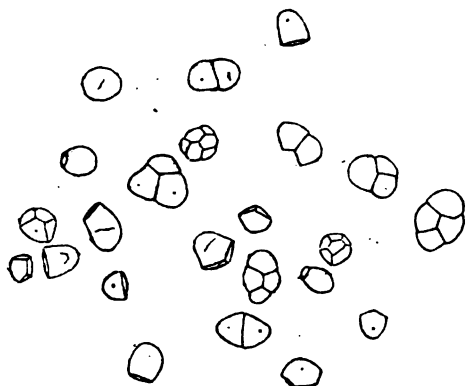


Fig. VI.—Ipecacuanha; Starch of Brazilian Root. x500.

The component grains number commonly from two to four, occasionally as many as eight or even more, and are most frequently muller shaped, with one or two flat surfaces. The hilum is usually a distinct point; or its position may be indicated by a simple

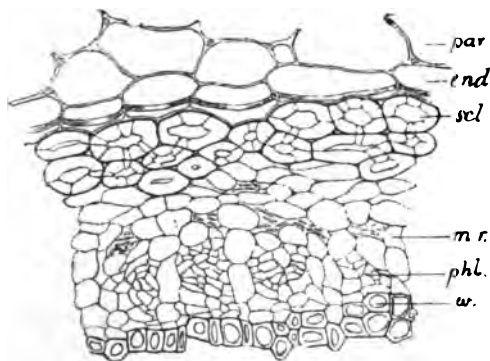


Fig. VII.—Ipecacuanha; Brazilian Stem. Trans. Sect. x200.

or triangular cleft. In length they occasionally reach 0.0125 Mm., but never exceed 0.015 Mm. These figures are derived from measurements of grains in several roots of each of about twenty samples. Swollen grains are frequently to be found, and indicate the use of artificial heat, probably in drying the root.

The alkaloids are said to reside principally in the parenchymatous tissue near the phloem. On account of the starch with which the tissues are loaded, its detection microscopically is very difficult. The two precipitants usually employed,

potassium bichromate and picric acid, have yielded in my hands unsatisfactory results. I have endeavoured to turn to account the only definite colour-reaction of emetine, that with chlorine, by allowing the gas evolved from a crystal of potassium chlorate and strong hydrochloric acid to impinge on a moist section. By this means emetine solutions are coloured brown or deep yellow. Sections of ipecacuanha root treated in this way are cleared of starch by the hydrochloric acid vapour and the parenchymatous cells, especially those near the cork assume a decided yellow or yellowish-brown colour. The wood is comparatively slightly effected. From results with dried roots, however, no con-

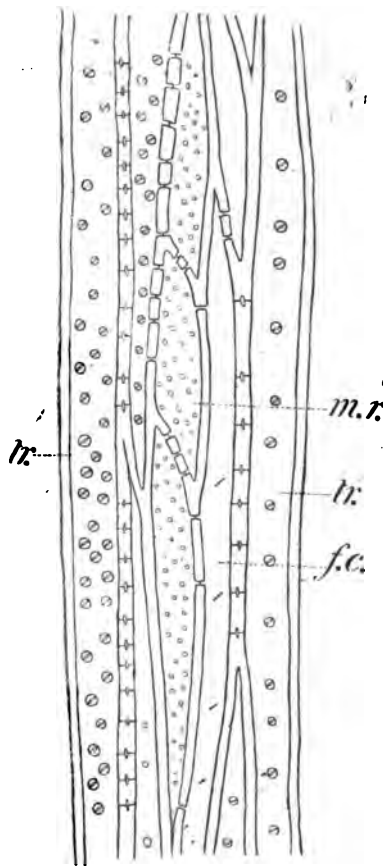


Fig. VIII.—Ipecacuanha; Brazilian Stem. Tang. S. x350.

clusions can be drawn as to the localisation of the alkaloid in the fresh root, since it has been repeatedly shown that during the process of drying alkaloids escape from the cells in which they were originally contained and pass into the neighbouring tissue.

Having dealt at some length with the histological features of Brazilian ipecacuanha root, the anatomy of the erect stem may be discussed more briefly.

In this the cork, which is similar in structure to that of the root, is of subepidermal, not pericyclic, origin. The extra-stelar parenchyma (Fig. VII., *par.*), which is very narrow in comparison with the secondary bark of the root, frequently contains

starch grains and raphides. The endodermis is distinct; a portion of the middle lamella running axially and tangentially around each cell is lignified, and hence can easily be rendered conspicuous by the usual lignin reagents (Fig. VII., *end.*). Within the endodermis the cells of the pericycle very frequently thicken and lignify, and thus form a more or less complete ring of sclerenchymatous cells one, two, or even three deep (Fig. VII., *sc.*). In transverse section they appear more or less tangentially elongated; sometimes, indeed, the tangential axis is longer than either of the others. They are provided with unbranched pores and vary in diameter from .01 to .12 Mm., commonly ranging from .03 to .06 Mm. (Fig. VII., *sc.*). In the erect stem this ring is usually well developed; in the prostrate stem it is much reduced, whilst from the root it is completely absent. Hence

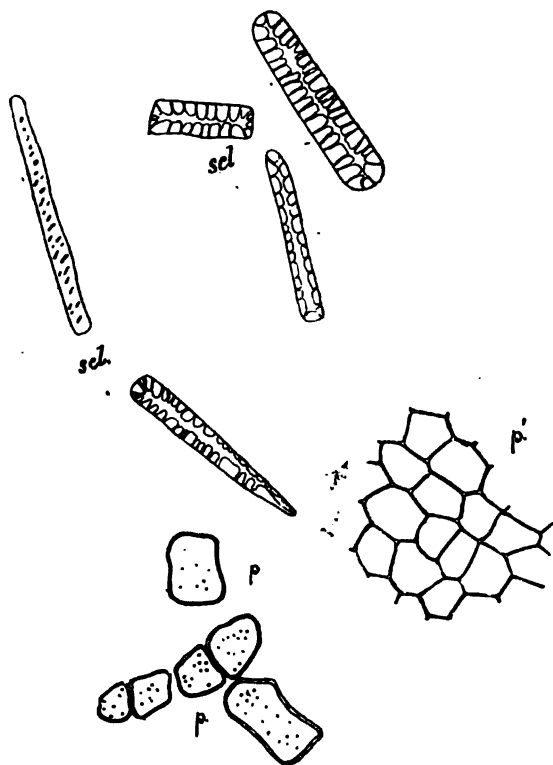


Fig. IX.—Ipecacuanha; Elements of Brazilian stem. *Sc.*, scl. cells; *p.*, pith cells; *p'*, cork cells. x160.

it is possible to find portions of stem with a tolerably complete ring at one end and no sclerenchymatous cells at all at the other.

The phloem and the conjunctive parenchyma is far less developed in the stem than it is in the root, but the wood presents much the same appearance. In the centre, however, is a fairly large pith, the cells of which have slightly thickened, porous lignified walls (Fig. IX., *p.*).

As an accurate knowledge of the distinguishing anatomical details of the stem is important, it is necessary to separate this also into its component elements (Fig. X.). Both tracheides (*tr.*) and fibrous cells (*f.c.*) will be found, the latter in this case predominating. Wood-parenchyma (*par.*) and inter-

mediate cells (*int. c.*) are also present; all these resemble the corresponding elements in the root wood. Further, the sclerenchymatous cells (*sc.*) from the pericycle are very characteristic and easily found. The cells of the pith (*p.*) are usually nearly cubical, and distinguished from cells of the extrastelar parenchyma (and of the cortical parenchyma of the root) by their distinct pores and by the lignin reaction, which they yield with any lignin reagent. Lastly, here and there can be found a portion of a spiral vessel (*sp.*) an element present in the protoxylem, but not in the secondary wood.

Hence it will be seen that there are three elements which characterise the stem and distinguish it from the root, viz., the sclerenchymatous cells of the pericycle, the lignified cells of the pith and the spiral vessels of the primary xylem.

Cultivated ipecacuanha from Singapore occasionally finds its way into the London market. It is identical in physical character, in structure, and in

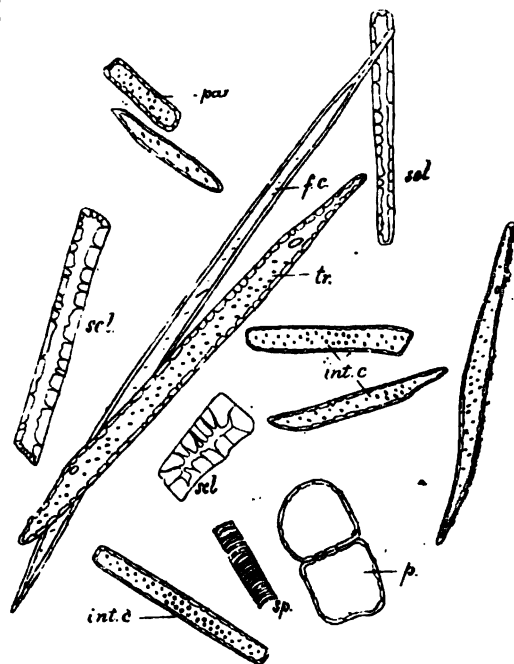


Fig. X.—Ipecacuanha; Elements of Brazilian Stem. x160.

the size of the starch grains with the Brazilian root, and is practically indistinguishable from it. It appears to be unusually free from stem and to show well-developed annulations.

A small parcel of Madras cultivated root offered for sale in January was remarkable for its strong annulations and its freedom from stem; no striking difference from Brazilian root could be detected.

During the last few years an ipecacuanha has been imported in large quantities from Carthage, the botanical source of which is unknown. It differs from the Brazilian by its size, which is usually greater, by the annulations, which are usually less marked—in fact, they are often represented by little more than raised ridges—and by the stems, which are commonly thicker. It is the "ipecacuanha annelé majeur" of Guibourt ("gris blanc" of Merat), who says in 1820 that it occurs

only very sparingly. I have examined an original specimen of Guibourt's preserved in our museum and find it to be undoubted Carthagena root.

This *Carthagena ipecacuanha* occurs both in red and brown or dark greyish-brown varieties, a difference due mainly to the soil. In structure, both of root (Fig. XI.) and stem (Fig. XII.), it is practically identical with the Brazilian drug. In the stem, which is usually erect, seldom prostrate, the same ring of sclerenchymatous cells can be found, and the extent to which this is developed may vary in one and the same piece.

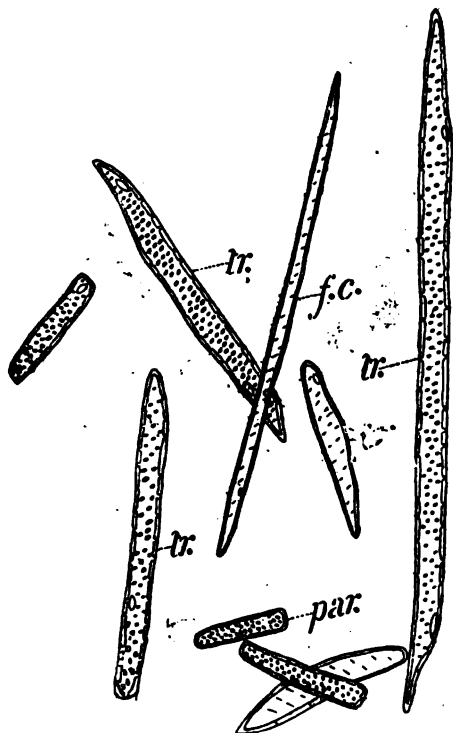


Fig. XI.—*Ipecacuanha*; Elements of Carthagena Root-wood. $\times 160$.

The most characteristic feature that can be found is the size of the starch grains (Fig. XIII.). The largest of the single grains frequently reaches $\cdot 017$ to $\cdot 022$ Mm., but rarely exceeds the latter figure. They vary, however, in size in roots from one and the same bale, and even in a root and its branch. They are usually largest and least compound in roots with a thick cortex, smallest and most compound in the stem. These particulars are also derived from the examination of roots from at least twenty different bales. As regards size, therefore, the starch grains are liable to variation, and some caution is necessary in employing such a character for the purposes of diagnosis. The same is true of the elements of which the wood of Brazilian or *Carthagena ipecacuanha* is composed.

It has been suggested by Professor Hartwich * that the *Carthagena ipecacuanha* which reaches the market is derived from two distinct plants. This opinion he bases on the difference in colour, in the

number of component grains in the compound starch grains, in the presence or absence or sclerenchymatous cells, and in the greater or less distinctness of the medullary rays. I have endeavoured to show that the red colour, at least in the samples I have examined, is partly due to adhering soil, and finds a parallel in the Brazilian root; that the compound starch grains vary in the number of their component grains in one and the same root; that sclerenchymatous cells may similarly be present in or absent from different points in one and the same stem. Certainly the medullary rays in some roots do appear to be more distinct than in others,

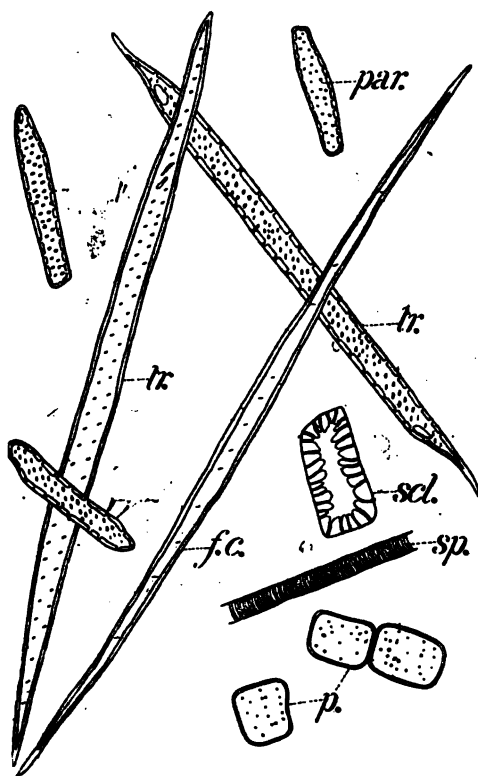


Fig. XII.—*Ipecacuanha*; Elements of Carthagena Stem. $\times 160$.

but I do not think that there is sufficient evidence to support Professor Hartwich's opinion.

From the foregoing details it will be gathered that as distinctive characters of *ipecacuanha* root, either Brazilian or Carthagena, by which it may be recognised as such in the form of powder, there may be mentioned (a) the form and size of the starch grains; (b) the absence of vessels, presence of perforated tracheides; (c) the acicular raphides; to these may be added (d) the emetine reaction with chlorine.

The stem may in either case be distinguished from the root (in powder) by (a) the presence of sclerenchymatous cells; (b) of lignified cells of the pith; (c) of spiral vessels.

Lastly, *Carthagena ipecacuanha* may in most cases be distinguished from Brazilian by the larger

* 'Ph. Zeitschr. f. Oesterreich,' xxxii., 845.

size attained by its starch grains. In this respect it must be carefully remembered that Carthagena roots with small starch grains occur, which are practically indistinguishable when powdered from Brazilian roots with large grains. Possibly during the investigation now in progress, of the quality of

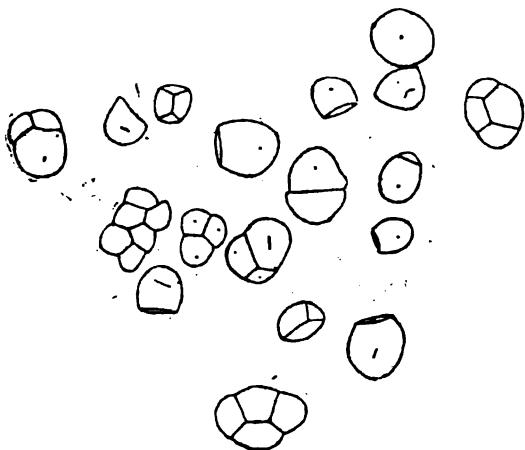


Fig. XIII.—Ipecacuanha; Starch of Carthagena Root. x500.

the powdered ipecacuanha supplied to retail pharmacists by wholesale druggists, other characters may be brought to light that will facilitate the identification of these two varieties of ipecacuanha.

THE CHEMISTRY OF IPECACUANHA.

BY DR. B. H. PAUL AND A. J. COWNLEY.

In some papers published conjointly by us previously, in the *Pharmaceutical Journal*,* it has been shown that the descriptions generally given of the alkaloid, to which the medicinal action of ipecacuanha is attributed, are for the most part erroneous. It is stated that this constituent of the drug, as hitherto obtained, is chemically an individual substance; but the accounts given of its physical characters are remarkably discordant. We have, on the contrary, shown that ipecacuanha resembles cinchona bark—a product of the same natural order—in containing at least two alkaloids, and probably other alkaloids in smaller proportions.

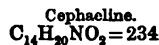
Of the two alkaloids which we have isolated and examined, one is uncrystallisable but capable of forming salts which are crystallisable, though for the most part very freely soluble. This base is readily soluble in ether, alcohol, or chloroform, very sparingly soluble in water or petroleum spirit, and insoluble in solutions of caustic alkali. We have retained for it the name of emetine.

The other alkaloid—cephaeline—is crystallisable, less soluble in ether than emetine, but freely soluble in alcohol or chloroform, much more soluble than emetine in hot petroleum spirit, and readily soluble in solutions of caustic alkali.

By these characters the difference between the two alkaloids is very distinctly marked. There are also differences in their melting points—emetine melting at 68°C., cephaeline at 102°C.—and in their percentage composition, as is shown by the following comparison:—

	Emetine.	Cephaeline.
Carbon	72.01	71.28
Hydrogen	8.86	8.69
Nitrogen	5.75	6.24
Oxygen	13.38	13.79
	100	100

These figures give as their most simple expression the following formulæ:—



Analysis of the neutral hydrochloride salts has shown that the quantities corresponding to these formulæ are respectively equivalent to one molecule of hydrochloric acid.

The very marked peculiarity, common to both alkaloids, of forming crystalline salts more readily in the presence of excess of acid than when neutral solutions are slowly evaporated, led at first to the erroneous conclusion that neutral cephaeline salts were uncrystallisable and that the crystallisable salts of both emetine and cephaeline were acid salts. It has since been ascertained that cephaeline hydrochloride can be obtained in well-defined prismatic crystals when a slightly acidified solution is slowly evaporated, and that this salt contains equal molecular proportions of alkaloid and acid.

In the case of emetine the influence of an excess of acid in determining the formation of a crystalline salt is still more marked. On adding a drop of moderately strong hydrochloric acid to a particle of emetine, a mass of acicular crystals is at once formed.

Both emetine and cephaeline are very sensitive to the influence of light. Though perfectly colourless when pure and in a free state, they rapidly acquire a yellow colour when exposed to sunlight. Solutions of the alkaloids in alcohol, chloroform, benzene, or ether, also become coloured on exposure to light with formation of a reddish-coloured deposit. The salts of both alkaloids on the contrary do not appear to undergo similar alteration; but in a pure state remain perfectly colourless when exposed to light.

Since the publication of the last paper on ipecacuanha a third alkaloid—the probable existence of which has already been indicated—has been isolated in small quantity. It exists in the drug in very small amount relatively to emetine and cephaeline, and it differs from those alkaloids in being very sparingly soluble in ether. This alkaloid is soluble in alkaline liquids, and it remains in the ammoniacal liquor from which emetine and cephaeline have been extracted by shaking with ether. It was extracted from that liquor by shaking with chloroform. The quantity obtained as yet was too small to admit of complete examination, but the physical characters of this alkaloid distinguish it in a very definite manner. It is a crystallisable substance obtainable by slow evaporation of an ether solution in well-defined transparent prisms of a pale lemon-yellow colour. It melts at about 138°C., neutralises acids, and apparently has a much higher molecular weight than emetine or cephaeline. It dissolves readily in alcohol or chloroform, the solutions becoming dark coloured on exposure to light and depositing a dark brown substance.

The failure of most previous observers to arrive at correct conclusions in regard to the alkaloids of

* Ph. J., liii., 61, liv., iii., 378.

ipecacuanha presents some collateral features of interest, inasmuch as it shows how largely the results of such investigation may be determined by accidental circumstances. The extraction of ipecacuanha with chloroform in the presence of caustic potash adopted by Lefort, naturally furnished a product consisting of a mixture of all the alkaloids, and in the absence of any ascertained distinction between them their separation was impossible. Hence the formula assigned to emetine by that observer, on the basis of Dumas' analysis, was inaccurate. In the subsequent investigation by Lefort and Wurtz the result arrived at was defective for the same reasons, although the mixed alkaloids were then obtained in a condition of greater freedom from impurity by extracting the drug with ether in presence of lime.

The result obtained by Podwyssotzki by using ferric chloride to get rid of the tannic constituent was vitiated by the use of petroleum spirit for extracting the drug. While the product thus obtained was an indefinite mixture of cephaeline and emetine as a consequence of the action of that solvent on both the alkaloids, probably the greater part of the emetine was not extracted at all by the petroleum spirit. In the investigation by Kunz petroleum spirit was also used for extraction with a similar result, as shown by the fact that the alkaloid obtained is described as (partially ?) soluble in caustic alkalies. The formula deduced from analysis by Kunz was, therefore, necessarily incorrect, as the material operated upon by him must have been of a mixed nature. The experiments made by Kunz for the purpose of ascertaining the constitution of emetine were also for the same reason fallacious, and, therefore, no importance can be assigned to the conclusions arrived at by him in 1887, or to those which he has more recently put forward on the same basis.

The investigation of the alkaloid of ipecacuanha by Glénard was, however, more fortunate in its result. That circumstance was due to the care taken in obtaining the alkaloid in the state of a crystallised neutral hydrochloride, after extracting it from the drug by treatment with lime and ether. As a natural consequence of this mode of operating, the cephaeline was eliminated, and emetine was isolated in a pure condition, as shown by the results of Glénard's analyses, which correspond very closely with our own. Indications of the existence of another alkaloid were observed by Glénard, but they were not followed up by him.

Glénard's observations appear to have received little notice, however, and in most chemical works the formula assigned to emetine by Kunz has been adopted as the most satisfactory. That view must now be abandoned since the data already published in our previous papers prove that the substance to which it relates could not have possessed chemical individuality.

It is satisfactory in connection with this point to be able to refer to results obtained by Messrs. E. Merck, of Darmstadt, in following up our observations on the alkaloids of ipecacuanha. In the *Bericht*, for 1894, recently published by that firm, it is stated that on repetition of our work in their manufactory, our descriptions have been fully confirmed, while the statements of Dr. Kunz-Krause could not be adopted. Following the indications given in the papers already published by us,

Messrs. E. Merck now manufacture emetine and cephaeline and their salts, and announce that they are prepared to supply these substances for medicinal use. We understand that they are already receiving orders from England.

The reputed value of ipecacuanha in the treatment of acute dysentery gives a great importance to this drug, but its emetic action has been found an inconvenient objection. Acting upon the assumption that the emetic action is due to the alkaloid, it has been proposed to make use of the drug from which that constituent has been removed. The successful results obtained by some medical men in India with de-emetinised ipecacuanha suggest the possibility that the value of the drug as a remedy for dysentery may be due to some other treatment than the alkaloid.

Some attempt was therefore made to isolate and study another constituent of ipecacuanha which has been described by Willigk, under the name of ipecacuanhic acid, as analogous to tannic acid and having a composition represented by the formula $C_{14}H_{18}O_7$. Following on the lines of Willigk's process an alcoholic extract of ipecacuanha was mixed with basic lead acetate until no further precipitate was formed. The lead precipitate, collected and thoroughly washed with strong alcohol, was treated with weak sulphuric acid not quite sufficient to convert the whole of the lead into sulphate, and the clear alcoholic liquid was evaporated to dryness. In that way a reddish-brown amorphous material was obtained amounting to about 2.25 per cent. of the drug, and corresponding to Willigk's description,—very soluble in water, or alcohol, of bitter taste, and giving a green coloration with ferric salts, but not precipitated by gelatin. It was found to have no emetic action in doses of 4 or 5 grains. After boiling with acid it reduces Fehling's solution. The product so obtained was, however, a crude material, and probably of a mixed character. By treatment with absolute alcohol it was almost entirely dissolved, leaving about 5 per cent. of residue. The solution mixed with dry ether, gave a white precipitate amounting approximately to 20 per cent., which darkened on exposure, and presented some resemblance to saponin, and after boiling with acid it reduced Fehling's solution. On evaporating the ether alcohol solution a residue was obtained amounting to about 60 per cent., which was soluble in water, and gave a dark green colour with ferric chloride. The water solution did not froth on shaking, but after boiling with acid it reduced Fehling's solution.

These characters point to the probability that Willigk's ipecacuanhic acid was not a definite substance, but a mixture, and further examination will be requisite for ascertaining its true chemical nature. That appears to be of importance as regards the medicinal action of ipecacuanha, since it is stated on good authority that the utility of the drug in the treatment of dysentery is augmented by the removal of the alkaloids.

The two alkaloids, emetine and cephaeline, are contained in the ipecacuanha of New Grenada, as well as in that of Brazil, the only difference in this respect being the larger relative proportion of cephaeline in the New Grenada drug. So far, therefore, as the medicinal effects of the drug are due to these alkaloids jointly, there would appear to be but little

difference between Brazilian ipecacuanha and that of New Grenada, so that the latter might without disadvantage be made official in the Pharmacopœia.

Assuming that the medicinal properties of ipecacuanha are due to the alkaloids emetine and cephaeline, it may be inferred from the characters of these substances that in making galenical preparations of the drug, a process which would ensure their conversion into salts would be preferable to one furnishing a product in which the alkaloids were in a free state and liable to alteration under the influence of light. In that respect the acetic acid extract used in the preparation of the official B.P. wine would seem to be well adapted for the purpose, since solutions of the salts do not appear to undergo alteration when heated, unless it be that the acetic extract is too mixed a product containing some constituent which helps to destroy or remove the alkaloids. Mr. John O. Umney's observations on the loss of alkaloid in ipecacuanha wine to the extent of one-fifth seems to point in that direction. But now that the alkaloids or their salts are obtainable in a pure state, a very excellent ipecacuanha wine, suitable for administration as an expectorant, can be made by dissolving half a grain of emetine hydrochloride in four ounces of sherry.

WAX AND ITS IMPURITIES.

B. S. PROCTOR.

In view of the repeated instances in which tradesmen have suffered annoyance, if nothing worse, from its being found that wax which they have sold has not been pure beeswax, it is well that pharmacists should again have their attention drawn to the facility with which they can put a sample to two of the most important tests.

A sample of beeswax, white or yellow, should sink if thrown into B.P. solution of ammonia, '959 sp. gr. When first immersed it is liable to have air bubbles attached, which bring it to the surface, but if rubbed with the solution and immersed again it will if pure go to the bottom.

The B.P. gives the sp. gr. of wax as '950 to '970. In Watts' 'Dictionary of Chemistry,' 1894, the gravity is given as '965. In the *Pharmaceutical Journal*, March, 1887, Dieterich says it should be '963 to '964. My own observation, from clear honeycomb melted down, agrees with these latter figures, and I think the Pharmacopœia allows more latitude than necessary. If it be desired to take the exact gravity of a specimen which does not correspond closely with that of the solution of ammonia it is very conveniently done by adding a little water, or a little strong solution of ammonia ('880) till the gravity of the solution and the fragment coincide, and then determine that of the liquor with the specific gravity bottle.

Of course a correct density does not prove that the wax is pure, but it is fair evidence that there is no large admixture of paraffin wax, the most probable adulterant.

The next most important characteristic is the tough plasticity which a fragment shows with the warmth of the hand, it is best observed by rolling 2 or 3 grains like a pill between finger and thumb, then with strong pressure drawing the finger from the tip of the thumb towards the joint. Under this treatment, good wax should curl up towards the tip of the moving finger, while adulterated samples

usually spread like salve on the ball of the thumb, or crumble with the friction.

I do not bring these forward now as novelties, for I have elsewhere drawn attention to them, nor as superseding more elaborate examination, but simply as having value at the moment from the readiness with which they can be applied.

NOTES ON RECENT SCIENTIFIC INVESTIGATION.

SALTS OF ARSENIOUS ACID.—Up to the present time only a few of the salts of ortho-arsenious acid $\text{As}(\text{OH})_3$ have been obtained, and the existence of some of these has been doubted. The whole question has, however, been reinvestigated by Stavenhagen, who has prepared several new salts and confirmed some of the previous observations. Only the ortho-arsenites of calcium, magnesium, zinc, and silver were known, and possibly the Lead, chromium, and nickel salts. The salts of the alkali metals have been prepared in a similar manner to that of the potassium salt, which is as follows:—"Alcoholic potash and arsenious acid are mixed and boiled for a long time. After evaporation the syrupy mass is crystallised from absolute alcohol, when potassium ortho-arsenite, K_2AsO_3 , is obtained in needle-shaped crystals. The sodium and ammonium salts are non-crystalline, and are obtained in a similar manner. By means of the potassium salt, the corresponding salts of the other metals as strontium, barium, cadmium, tin, gold, platinum, etc., were able to be isolated and examined. The general method of preparation was as follows:—The salt of the metal, generally the chloride, was mixed with an aqueous or alcoholic solution of potassium ortho-arsenite, when the arsenite of the metal is precipitated and separated by filtration and purified if necessary by suitable methods. The complete series of metallic ortho-arsenites were obtained with the exception of those of chromium, nickel, and possibly copper. The salts of meta-arsenious acid, HAsO_2 , and of pyro-arsenious acid, $\text{H}_2\text{As}_2\text{O}_5$, were also examined and prepared, but this work was chiefly a confirmation of that of previous workers (*Journ. für prak. Chem.*, LI., 1).

SEPARATION OF NICKEL AND COBALT.—Certain characteristic differences noted by A. Villiers (*ante*, p. 607) when salts of nickel and cobalt are acted upon by sulphuretted hydrogen, have been utilised in the qualitative determination of minute quantities of nickel in the presence of a very great excess of cobalt (*Comp. rend.*, cxx., 46). To the solution containing the two metals, tartaric acid and a large excess of soda (not potash) are added, the acid preventing the precipitation of the metals as oxides. A current of sulphuretted hydrogen is then passed through the liquid until the cobalt is entirely precipitated, and the liquid immediately filtered. In the complete absence of nickel the filtered liquid is quite colourless, though it turns yellow in time owing to the liberation of sulphur. If nickel be present, however, the colour of the liquid will vary from black to brown, according as the proportion of nickel is great or small, but even traces can be precipitated, as the test is very delicate as well as very rapid. A fraction of the nickel will be carried down with the cobalt sulphide, the proportion varying with the dilution of the liquid, and conversely

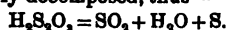
when there is a great excess of nickel, some cobalt remains in solution. Ammonium salts should be absent, as well as metals precipitable by sulphuretted hydrogen in acid solutions or by ammonia in the presence of ammonium chloride. As a general rule in the separation of the metals, the filtered liquid separated after adding sulphuretted hydrogen, and ammonia should be treated with fresh ammonium sulphhydrate, avoiding excess. The precipitate must then be treated with very dilute hydrochloric acid, and boiled. The black residue should be dissolved in a little aqua regia, and the solution tested for nickel and cobalt as already described, after evaporating off the greater part of the excess of acid. Care must be taken when but little cobalt is present to avoid too great dilution of the liquid, or the metal may remain in solution and colour it brown, in the absence of nickel. The addition of a large excess of soda, however, will completely precipitate the cobalt and leave the liquid colourless.

CHEMISTRY OF PHOTOGRAPHY.—Seyewetz and Chicaudard have endeavoured to explain the reactions resulting from the decomposition of sodium hyposulphite in fixing photographic images (*Bulletin de la Société chimique de Paris* [3], xiii., 11).

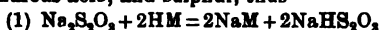
When an excess of acid reacts in the cold upon the hyposulphite, the reaction is as follows:—



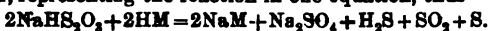
It may be that hyposulphurous acid is first liberated and immediately decomposed, thus—



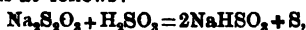
If the hyposulphite be in excess, sulphuretted hydrogen, sulphurous acid, and a sulphate are formed. This may be explained by supposing that the nascent hyposulphurous acid, in the presence of the excess of hyposulphite, gives rise to a very unstable acid sodium hyposulphite, which ultimately decomposes into sodium sulphate, sulphuretted hydrogen, sulphurous acid, and sulphur, thus—



or, representing the reaction in one equation, thus—



The sulphurous acid and sulphuretted hydrogen, in turn, are capable of decomposing sodium hyposulphite, besides reacting upon each other. In the case of an excess of sulphurous acid, the equation representing the result is as follows:—

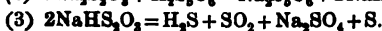
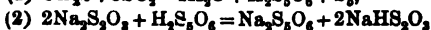
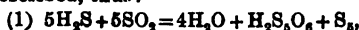


but with excess of the hyposulphite it would be—

$2\text{Na}_2\text{S}_2\text{O}_3 + \text{H}_2\text{SO}_3 + \text{H}_2\text{O} = \text{H}_2\text{S} + \text{Na}_2\text{SO}_4 + 2\text{NaHSO}_3 + \text{S}.$ Sulphuretted hydrogen gradually decomposes sodium hyposulphite into sodium bisulphite and acid sulphide, and sulphur, thus:—



whilst with sulphurous acid it forms pentathionic acid, which in turn reacts with sodium hyposulphite to form sodium pentathionate and hyposulphurous acid, the latter again forming, with excess of hyposulphite, an acid hyposulphite which splits up as already described, thus:—

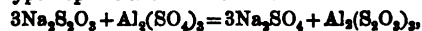


Thus, the action of an acid, in the cold, upon an excess of hyposulphite gives rise to sulphurous acid sulphuretted hydrogen, a salt of sodium corresponding to the acid employed, sodium sulphate, and sulphur, whilst secondary reactions result in the formation of sodium bisulphite, pentathionate, and acid sulphide.

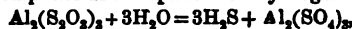
The action of aluminium sulphate upon an excess of sodium hyposulphite on boiling, results as follows:—



In the cold, however, sodium sulphate and aluminium hyposulphite are first formed:—



but the latter, being very unstable, splits up into aluminium sulphate and sulphuretted hydrogen:—

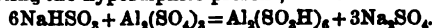


and the sulphuretted hydrogen, in the presence of excess of sodium hyposulphite, converts the latter into sodium bisulphite and acid sulphide, whilst sulphur is liberated thus:—



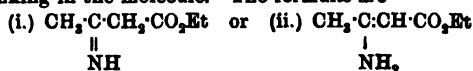
All the reactions take place very slowly, and this explains why fixing agents containing hyposulphite and alum deposit sulphur during a length of time, although they retain their property of hardening gelatin on account of the gradual regeneration of aluminium sulphate, and the formation of aluminium bisulphite which acts in a similar manner.

With regard to the action of sodium sulphite and bisulphite when added to prevent the decomposition of hyposulphite by acids or alum, the bisulphite has no such effect in the case of acids, though the sulphite is converted in bisulphite, and thus slightly retards decomposition. The effect is more marked in the case of alum, however, the bisulphite or sulphite reacting with it to form the corresponding salt of aluminium, without affecting the hyposulphite present, thus:—

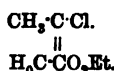


The aluminium bisulphite does not act upon sodium hyposulphite, which is only altered by free sulphurous acid, and as the action of alum upon hyposulphite is very slow, it is not surprising that the presence of sodium bisulphite or sulphite considerably retards the decomposition. If the proportions employed be one of alum to twenty of hyposulphite, the weight of commercial bisulphite (40 per cent.) employed should be one-fifth that of the alum. But with a mixture of fifteen grammes of hyposulphite and sixty grammes of alum, the bisulphite should not exceed one-hundredth part the weight of the latter.

ACTION OF AMMONIA ON ACETO-ACETIC ESTER.—The exact constitution of the product obtained by the action of ammonia on aceto-acetic ester has been investigated by Thomas Mamert (*Bull.*, xiii., 68). Two views have been held as to the constitution of this compound: (i.) that it is an imido-derivative, i.e., contains the group =NH, replacing the carbonyl oxygen in aceto-acetic ester; (ii.) that it is an amido-compound, and thus contains the group -NH₂, which replaces carbonyl oxygen, and results in an ethylene linking in the molecule. The formulæ are—



From this it will be seen that according to (ii.) the substance is the ethyl ester of amido-crotonic acid. This view is supported by Collie and by the physical properties as determined by Bruhl and Perkin. The work of Thomas Mamert also supports this view. The ethyl ester of the β -chlorocrotonic acid was prepared by the action of phosphorous pentachloride on ethyl acetoacetate. By this method, however, a mixture of the two stereoisomeric β -chlorocrotonic esters was obtained, so the mixture was boiled with a little iodine, when the whole was converted into the β -chloranticrotonic ester, the formula of which is



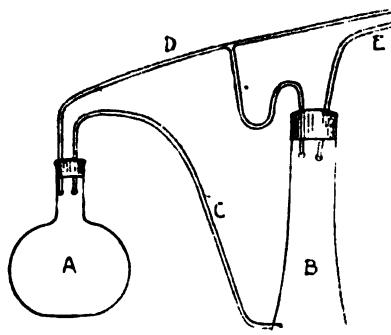
This salt was now treated with alcoholic ammonia, when a product, identical with that formed by the action of ammonia on ethyl acetoacetate, was obtained. The body thus obtained must contain NH_2 in place of Cl , and on reference to the formulae it will be seen to be identical with the formula (ii.) given above. The product of the action of ammonia on ethyl acetoacetate, the corresponding ester is therefore of amido-crotonic acid.

CALCIUM CARBIDE.—The decomposition of this compound by water into pure lime and acetylene has recently been made use of on a large scale in the United States for the formation of acetylene gas, which it is proposed to use as an enricher of coal gas. As calcium carbide at present can only be prepared by means of the electric furnace, the electricians are pleased to find that they can be of service to the manufacturers of coal gas, and consequently the subject is one which is of considerable interest at the present time. According to Moissan, calcium carbide can be obtained by placing an intimate mixture of 120 grammes of calcium oxide from marble and 70 grammes of carbon from sugar in the crucible of the electric furnace, and subjecting it to the action of a current of 350 amperes and 70 volts for 15 or 20 minutes, when a yield of 120 to 150 grammes of the carbide is formed. Although in the United States the process adopted is somewhat different to that used by Moissan, the yield cannot be any better, seeing that, theoretically, 56 parts of lime can only produce 64 parts of the carbide, and the amount of electrical energy required must also be very similar. It is therefore evident that the process is one which will depend for its ultimate success upon the cost of production, and although the carbide is at present quoted at £4 per ton when manufactured in the States, using water-power as the source of the electrical energy, its cost of manufacture would be much higher when steam is employed. Although the high illuminating power of acetylene when burnt renders it eminently suitable for use as an illuminant, it will be seen that from its cost it is not at present likely to be adopted to any large extent in this country. Since, however, the gas may be compressed and stored in the liquid condition in cylinders, it may be found of service in this form, as a substitute for petroleum or candles in country houses and in dis-

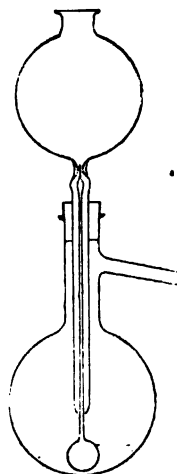
tricts where coal gas is not available, or where the conditions do not warrant the expenditure of a large amount of capital in electrical or other permanent fittings. Since from acetylene nearly the whole of the synthetic organic compounds can be readily obtained, as a source for the preparation of pure pharmaceutical preparations it may have a new future before it. The difficulty of obtaining pure materials has militated against the use of some of these newer synthetic remedies in the past, and as it is essential that organic compounds for medicinal use shall be of absolute purity, preparations derived from pure acetylene which amongst other advantages must necessarily be free from sulphur, ought to be of considerable value.

NOVEL LABORATORY DEVICES.

EXTRACTION APPARATUS.—This apparatus, devised by Chas. E. Parker (*Amer. Druggist*, xxv., 391), is intended for use in extracting alkaloids, etc., from drugs. The solvent is placed in A, and the marc in B, the two tubes E and D passing into an inverted con-



denser. On heating, the vaporised solvent passes into D, where it is condensed, then runs into B, and slowly percolates through the marc. Before commencing operations sufficient liquid must be placed in B to cover the lower end of the tube C, through which the saturated solvent is siphoned back to A.



CONSTANT LEVEL APPARATUS.

—In the apparatus designed by J. C. Chorley, *Analyst*, xx., 16, for maintaining a constant level of liquid in a distillation flask, the small bulb at the lower extremity of the long thin tube inside the flask floats on the surface of the liquid. The upper end of the same tube is ground to fit into the thickened part of the larger tube surrounding it and prevents the water in the large bulb on top from flowing into the flask, except when the level of the liquid falls in the latter.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, FEBRUARY 16, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

SUPPLEMENT TO THE CODEX MEDICAMENTARIUS.

THE last edition of the 'Codex Medicamentarius,' or French Pharmacopœia, was published in 1884, and there seems no immediate prospect of a re-issue for some time to come, but the increase in the number of new remedies in recent years has been so great that it has been found necessary to publish a Supplement, since the need of official guidance with regard to many substances was too pressing to admit of delay until the publication of a new edition of the complete work. The Supplement has been prepared by a commission of twelve medical men and pharmacists, the president being M. BROUARDEL, and the vice-president, M. PLANCHON. It contains both additions and corrections to the Codex, the order adopted being the same as in that work, and occupies one hundred and ten pages. In the first place, the tables of densities of mixtures of alcohol and water, published in accordance with the decree of September 27, 1884, is reproduced in *extenso*. Then follow the lists of additions, etc., to the four parts of the Codex—crude vegetable drugs, chemicals, galenicals, and veterinary preparations. The novelties in the first list are the bark of *Rhamnus purshiana* (D. C.); the bark of *Euonymus atropurpureus* (Jacq.); *Sorithamnus scoparius* (Koch); the bark and leaves of *Hamamelis virginica* (L.); the rhizome of *Hydrastis canadensis* (L.); the seeds of *Sterculia acuminata* (Beauv.), and of *Strophanthus kombe* (Oliver).

The list of chemicals is remarkable for the number of synthetic and proprietary remedies included. Thus, antifebrin (*acétanilide*), sulphonal (*actone-diéthylsulfone*), phenacetin (*acet-phénétidine*), saccharin (*acide anhydro-orthosulfamide-benzoïque*), antipyrine (*analgésine*), benzonaphthol (*benzoate de naphthol β*), aristol (*diiododithymol*), dermatol (*gallate basique de bismuth*), exalgine

(*méthylacétanilide*), salipyrine (*salicylate d'analgésine*), and salol (*salicylate de phénol*), all find place. Other additions are bismuth sub-benzoate and sub-salicylate; caffeine hydrobromate and hydrochlorate; homatropine and its hydrobromate; strontium bromide, carbonate, and lactate; a combination of cantharidin and caustic potash (*cantharidate de potasse*) in crystals; cocaine and its hydrochlorate; neutral quinine hydrochlorate; crystallised ergotinin; eucalyptol (from *Eucalyptus globulus*); guaiacol; hydrastine; hydrastinine; menthol; α- and β-naphthol; hydrated bismuth oxide; paraldehyde; crystallised quassin; resorcin; cresol salicylate; eserine salicylate; β-naphthol salicylate; strophanthin (from *Strophanthus kombe*); sparteine sulphate; terpin (from recently rectified Bordeaux oil of turpentine); and trional (*diéthylsulphone-méthyléthyl-méthane*). Corrections are inserted with respect to acid boric, caffeine, and sodium iodide and salicylate.

Under the heading of galenic pharmacy are found formulæ for collodion with iodoform (1 in 10); purified cotton (*coton hydrophile* or *xylum preparatum*); medicated cottons; maltine (*diastase*); creosote elixir (creosote, 15 Gm., rum, 985 Gm.); soft extracts of cascara sagrada, hamamelis, hydrastis, kola, and strophanthus (prepared by exhausting 1000 Gm. dried drug with 6000 Gm. 60 per cent. alcohol, and distilling off excess of liquid); powdered extract of euonymus (exhaust root bark with 60 per cent. alcohol, evaporate, and mix powdered residue with sugar of milk); medicated gauzes—acid boric, iodoform, phenol, phenol salicylate, and corrosive sublimate; strophanthin granules (containing 0.1 Mgm. each); cod liver oil with creosote (creosote, 15 Gm., oil, 985 Gm.); pancreatin; paper impregnated with mercuric and sodium chlorides, for preparing an antiseptic solution; peptone (a mixture of soluble compounds resulting from the action of pepsin upon beef); sodium sulphorinate (*topique sulfuriciné* or *linimentum sulfuricinatum*, prepared by acting upon castor oil, 1000 Gm., with sulphuric acid 250 Gm. washing the product with solution of sea salt, partly neutralising with soda lye, and afterwards adding potassium carbonate, 30 Gm.). Sulphorinates of phenol, creosote, and phenol salicylate (prepared by dissolving phenol, creosote, or phenol salicylate, 20 Gm., in sodium sulphorinate, 80 Gm.), are also official; together with creosote pills (creosote 10 Gm., dried almond soap, q.s. to make 100 pills); aconitine powder (cryst. aconitine, 1 Gm., powd. sugar of milk, 96.5 Gm., carmine, 2.5 Gm.), and digitalin, aconitine nitrate, and strophanthin powders prepared in the same way. Other galencial preparations added are cascara sagrada powder; corrosive sublimate and tartaric acid powder (mercuric chloride, 2.5 Gm.; tartaric

acid, 10 Gm., 5 p.c. alcoholic solution of indigo carmine, 10 drops); syrup of narsceine (1 p.c.); hypodermic injections of caffeine, caffeine hydrochlorate, and basic and neutral quinine hydrochlorates; traumaticin (*soluti chloroformique de gutta-percha*, 10 p.c.); solution of crystallised digitalin, 1:1000; solution of hydrogen peroxide, 10 p.c.; solution of ferric-potassic tartrate (*tinctura Martis*); tinctures of cascara sagrada, hamamelis, hydrastis, kola, and strophanthus (1 to 5 of 60 p.c. alcohol in each case). Terpinol is directed to be prepared by acting on terpin, 100 Gm., with sulphuric acid, 10 Gm., mixed with water, 500 Gm., and distilling. Boric acid with vaselin (1 in 10); mercuric chloride with vaselin (0.1 Gm. to 100 Gm.); and wine of kola conclude the list. The directions for preparing wood-tar creosote (which should contain guaiacol, 20 p.c., creosol, 40 p.c., and monatomic phenols, 40 p.c.), chlorine fumigation, and granules of crystallised aconitine, digitalin, and aconitine nitrate, are corrected.

The additions to the veterinary preparations are but few. They are: Collodion with iodoform, already referred to; glycerols of starch, phenol (5 p.c.), and lead subacetate (*extrait de Saturne*, 10 Gm., in 30 Gm.); solution of calcium lactophosphate; lotion of nicotinic sulphate (10 p.c. in infusion of tobacco); β -naphthol ointment (10 p.c. with lard or vaselin); astringent powder (*poudre astringente de Knaup*), consisting of ferrous sulphate, 500 Gm., potash alum, 500 Gm., ammonium chloride, 30 Gm., zinc sulphate, 30 Gm., and finely powdered copper oxide, 30 Gm.; diarrhoea powder for calves (tannin, 5 Gm., acid salicylic, 5 Gm.); tincture for *l'anémie vermineuse*, composed of tincture of male fern, 25 Gm., extract of male fern, 5 Gm.; and carbolated vaselin (5 p.c.).

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

ACCORDING to the *Lancet* of February 9 the death-rate in London from diphtheria during the previous week had risen to 45 from being 34, 31, and 29 in the three weeks before that. Thus the interest in the newly adopted measures for treating the disease is by no means diminished. The reports of cases treated by antitoxin still continue to be decidedly in favour of the treatment. Two cases reported by Mr. Jessor to the Ophthalmological Society may be mentioned as examples of a rare form of the affection—a form in which the effect of the antitoxin had not previously been tried. One child, aged 19 months, had membrane on the inner surface of the left lower eyelid and on the uvula.

Typical bacilli were found in the membranes, and albuminuria and glandular enlargement were among the symptoms. Thus the diagnosis of the case was established beyond doubt. Three half-drachm injections of KLEIN's antitoxin were given, and the

membrane disappeared in five days, though no local treatment beyond the application of distilled water had been employed. In the second case both eyes were affected. The membrane disappeared in four days after the injection of two half-drachm doses of the same antitoxin.

Dr. HAYWARD, who made the bacteriological investigation, considered that the complete and rapid disappearance of the membrane should be attributed to the antitoxin, since no other similar cases had been recorded in which the membrane had disappeared so rapidly and completely. Careful records of the after-effects of the remedy also continue to be published. Urticaria and pains in the limbs are the more common effects, and these appear to be due to the employment of excessively large doses of the serum.

GANGHOFFER (*Prag. Med. Woch.*, 1895) observed that the injections seemed to diminish the amount of albuminuria. A similar observation was made in a case published by D. MACDONALD, of Carlisle (*Brit. Med. Journ.*, February 9, 1895). In one case only were serious symptoms noticed after the treatment. Dr. A. SEIBERT (*N.Y. Med. Rec.*, January 19, 1895). A girl of 6½ years, on the second day of illness, was injected with 20 C.cm. of antitoxin prepared at the New York Pasteur Institute. This dose was repeated the next day. In three days she was cured of the diphtheria, but five days after her recovery she was taken ill with a rash, which was followed by high fever and swelling of the lymphatic glands. This attack subsided, and again recurred. The secondary illness lasted seven days. The time of the appearance of the rash, etc., corresponds with that observed by others after the use of antitoxin. The important conclusion to be drawn from this case is that 20 C.cm. of serum is about four times as much as should be given as a first dose.

ARGON.

In the *Chemical News* for February 8, Dr. G. J. STONEY suggests that argon may turn out to be a compound of one of the six missing elements that lie between hydrogen and lithium, which "seem not to have been able to enter into, or remain in, combination under the conditions that prevailed at some stage of the earth's past history." Of these, argon is most probably a compound of "infra-carbon," and, assuming the atomic weight of the latter to be 2½ or 3, and that the element forms compounds similar to those of carbon, the new gas may be analogous to one of the paraffins, C₇H₁₆, C₈H₁₈, C₉H₂₀, or to some other hydro-carbon of the fatty series, or to hydro-carbons of the benzene series, or to naphthalene, diphenyl, turpentine, a monatomic alcohol, or other compounds, and its inertness may be such that even substitution derivatives may be very difficult to produce.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 6th inst., the Librarian and Curator presented the following report of donations to the Society's Library, Museum, and Herbarium:—

To the Library.

Mr. G. A. Barber, Antigua, M.A. (Corresponding Member):
Agricultural Journal of the Leeward Islands,
no. 2.

Supplement to the Leeward Islands Gazette, no. 32.

Mons. A. Herlant:

L'analyse du poivre de Clusius.

Mr. E. W. Giles, London:

Culpeper's Complete Herbal and English Physician Enlarged.

Pharmaceutical Society of Ireland:

Calendar, 1895.

To the Museum.

Mr. T. Hanbury, F.L.S., Ventimiglia.

Fruits of the myrtle-leaved and of the Chinotto Orange, and of *Hakea eucalyptoides*.

Mr. H. W. Ridley, M.A., Botanic Gardens, Singapore.

Extract of Neray bark (*Carapa moluccensis*).

Mr. J. Medley Wood, A.L.S., Botanic Gardens, Natal.

Specimen of a *Polyporus* used in native medicine, and of the fruits of *Strychnos spinosa*.

Messrs. Lewis and Peat, London.

Specimen of striated Ipecacuanha.

To the Herbarium.

Professor H. N. Rusby, M.D., College of Pharmacy, New York.

Fifty specimens of American medicinal plants.

Mr. J. Medley Wood, A.L.S., Botanic Gardens, Natal.

Specimen of *Solanum duplexsinuatum* and *S. Thuyppii*.

EVENING MEETING IN LONDON.

The third evening meeting of the session was held at 17, Bloomsbury Square, W.C., on Wednesday, the 13th inst., the chair being taken at 8 o'clock by Mr. Michael Carteighe, the President. Two papers were read—the "Histology of Ipecacuanha" by Professor H. Greenish, and the "Chemistry of Ipecacuanha" by Dr. B. H. Paul and A. J. Cownley. They are printed at pp. 685-692, and gave rise to the following discussion.

Mr. HOLMES said it appeared from the first paper that the Carthagena and Brazilian ipecacuanhas were practically the same, and that conclusion seemed to be supported by the chemical investigation. Another point seemed to be that the two plants were different varieties, not distinct species. There was on the table a specimen of the flower of one variety. Mr. Cownley's results were very interesting from the therapeutic point of view. It was well known that the drug from which the emetine had been removed was efficacious in dysentery, and as it now appeared that both emetine and cephaeline had an emetic action, the anti-dysenteric power was probably due to the third alkaloid. It was known that collectors of this plant were subject to an affection of the skin very similar to what would be produced by saponin. The question arose from

this paper whether when ipecacuanha was dispensed with caustic potash the emetine would not be thrown out, and only cephaeline remain and cause the expectorant action.

Mr. MARTINDALE asked the proportion of the two main alkaloids in the drug and if it was known whether the anti-dysenteric power was due to either of the alkaloids or to something else.

Mr. ELBORNE remarked that the Carthagena plant seemed likely to become of more importance. It struck him that the annulated rootlets were of the nature of tubers, in which starch grains were stored up for the future nourishment of the plant, and he should like to know what became of them in succeeding years. The action of light on one of these alkaloids would furnish ground for an interesting spectroscopic research, in which might be found a test for the alkaloid. He did not gather that the drug on which Dr. Paul and Mr. Cownley had been working was identical with what Professor Greenish had described, and that led him to suggest that in any such researches, if possible, a sufficient quantity of the actual drug operated on should be preserved in some central museum for the use of future investigators.

Mr. J. C. UMNEY said, as far as he understood, the powdered root and liquid extract used for dysentery were those from which the alkaloids had been removed, and it was quite possible that the action was due to the acid. He was glad to learn that at any rate one crystalline salt had been obtained from cephaeline, and that the process was so successful that Messrs. Merck had been able to work it on a commercial scale. It now remained to have a therapeutic investigation made in order to ascertain whether preparations should be standardised in relation to emetine, to cephaeline, or to the total alkaloid, as had been done up to the present; but as it had been shown that Kunz's formula was incorrect, and was made for a dibasic instead of a monobasic alkaloid, the quantity of Meyer's reagent used would probably be wrong. He had on several occasions examined the acetic extract of ipecacuanha root, and found that the whole of the alkaloids were extracted, but that in heating the extract to reduce it to dryness, 15 to 20 per cent. of the alkaloids was lost.

Mr. MARTINDALE said he understood that the so-called ipecacuanha *sine* emetine was not completely exhausted of the alkaloid.

Mr. CHAS. UMNEY said these papers were very interesting from several points of view. The whole subject had been for a long time in a state of muddle, owing to their ignorance of the facts which had now been brought forward. From the pharmaceutical aspect these researches came just at the right time; it was clear that the present method of preparation was wrong, the extract being spoiled by the cooking process to which it was subjected, and he hoped in the new Pharmacopoeia the results of these researches would be embodied. Commercially, again, it was of great importance to know that the Carthagena root, which was not admitted into New York at all, and which fetched on the market about 25 per cent.

less than the Rio, was equally good, and there seemed no reason why it should not be recognised. He had been surprised to see in a medical paper the wonderful results in dysentery of the root which had been exhausted of the alkaloid, and he felt little doubt that its efficacy was due to the ipecacuanhic acid.

Mr. C. E. SAGE said he had worked on large quantities of both Brazilian and Carthagena root, and found that in respect of total alkaloid the latter was as good as a poor Brazilian. It was quite reasonable that it should be recognised. He saw no reason why the acetic acid preparation should be spoiled by so much heating.

Mr. MARTIN, having spoken in high terms of both the papers, said he hoped one of the results would be that in the next Pharmacopœia they would have another standardised preparation. He could never understand why extractives containing alkaloids should be so tortured by heat, as you did not know how they might be split up. If acetic acid were properly used it might play a much more active part in the extraction of vegetable alkaloids.

Mr. E. J. PARRY said it appeared from the last number of the Chemical Society's *Journal* that in Dr. Kunz's opinion the formula for emetine given by Messrs. Paul and Cownley was an impossible one, as it broke the law of so-called even atomicities.

Professor ATTFIELD said it was very satisfactory to see that the Pharmaceutical Society was endeavouring to focus the results of individual workers, and to give to the medical world all that could be discovered with regard to the chemistry, pharmacy, and physics of drugs, but there was still required a great deal more light on the pharmacological side. He often wished that there were in this country a society for doing such work, so that when the Pharmaceutical Society had done its work on drugs, their medicinal action could be ascertained. It must be remembered that only those drugs whose remedial action was known could be included in the Pharmacopœia. The compilers of the Pharmacopœia would, of course, do all they could, but individual pharmacists would do well to experiment in the way of making galenic preparations and then publish their results, which would be of great assistance.

Mr. COWNLEY, in reply, said there was more cephaeline in Carthagena root than in Brazilian, and more in the Brazilian stem than in the root. They had been in hopes of having some results as to the practical action of these alkaloids, but they had not come to hand in time. He could not say for certain whether the anti-dysenteric action was due to the alkaloids or not, but the de-emetised root generally met with did contain some alkaloid. The total amount of alkaloid in Carthagena root was generally about 2 per cent., of which about 30 per cent. was cephaeline, nearly 70 per cent. emetine, and a very small quantity of the third alkaloid. It might be found that cephaeline acted better than emetine, and, if so, the amount present would be of the highest importance in fixing a standard. Dr. Kunz was probably annoyed that they had found that his emetine was composed of at least three alka-

loids, and he was thus led to raise a side issue about the formula. If any one objected to $C_{15}H_{23}NO_2$ on the ground that the perissad elements did not make an even number, they had only to double the numbers and the objection was gone. Various formulae had been given by different investigators, and they had simply adopted Glénard's. Kunz had never been able to get a crystalline hydrochloride.

Mr. HILLS asked if there were any reason why, when the original work was done here, the alkaloids should not be manufactured in England.

Mr. MARTIN said he had been over Messrs. Merck's factory, and saw there something like 2,000 gallons of rectified spirit being used on which no duty was paid. Englishmen could manufacture alkaloids as well as Germans if it were not for the spirit duty.

Votes of thanks having been accorded to the authors of the papers,

Mr. STILLINGFLEET JOHNSON then gave a demonstration of the method of ascertaining the quantity of sugar in urine, devised by his father, Sir George Johnson, as recently described in the *Journal* (*ante*, p. 604). The "picro-saccharometer" used on the occasion was furnished by the makers, Messrs. C. E. Müller and Co., High Holborn, W.C.

The PRESIDENT proposed a vote of thanks to Mr. Johnson, which was carried unanimously, and the meeting then adjourned.

Proceedings of Societies in London.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, January 31, Mr. Sidney Davis in the chair. A paper entitled "Some Dartmoor Flowers" was read by Mr. D. P. Fuge.

The author prefaced his paper by a few remarks upon the physical aspect of Dartmoor.

He reminded his audience that the "Moor" comprised nearly the whole of central and south-west Devonshire, a county producing a very large and varied flora, and whose bluff rocks, cliffs, and sands running right away into fertile pasture ground afford habitat for most of the plants found elsewhere in Britain.

The Moor proper is bounded by downs of gorse and heather, and is itself a vast stretch of granite covered by a thin stratum of black soil, the continuity of which is broken by rugged boulders and "tors" or granite hills.

The abundance of thyme and heather was noted, and the property they had of imparting flavour to the mutton fed thereon.

The devil's bit and eyebright grow freely, and local legends connected with them were related in detail whilst those connected with St. John's wort and the royal fern were referred to incidentally. The stunted growth of the rowan and other trees was described and accounted for.

In the discussion which followed the Chairman, Miss Buchanan, Messrs. Walker, Bastow, Jealous, Woodruff, and the Secretary took part.

ROYAL INSTITUTION OF GREAT BRITAIN.

THE INTERNAL FRAMEWORK OF PLANTS AND ANIMALS.

In continuation of his lectures on the internal framework of plants and animals, Professor Stewart dealt on Tuesday, February 5, chiefly with the means by which sponges are provided with the necessary support. Drawing attention to the calcareous spicules found in many sponges, he pointed out that although these are formed by the protoplasm, when examined with the polariscope they behave exactly as if they had been carved from a solid piece of calcite. In hexactinellid sponges the spicules, he observed, were six rayed as in the glass rose sponge. In this species, which lives at great depths in the sea, the spicules are not fused or cemented together, but simply entangled. By means of spiral bundles of spicules driven into the globigerine ooze, the creature anchors itself to the bottom; these spicules may attain a length of two or three feet. A common sponge, *Halichondria penicea*, was selected to exemplify the structure. Here branched canals excavated beneath the ectoderm communicate by ciliated chambers at the terminations of their ramifications with the branches of similar cavities proceeding from the endoderm. By the flagella in the chambers circulation of water is maintained. In the siliceous and horny sponges these flagellate cells are much smaller than they are in the calcareous. Tetractinellid sponges have four-rayed spicules; in the lithistid group of these the spicules are held together by the interlocking of the ramifying terminations of the rays or by clasps with which one ray encircles its neighbour. In *Discoderma* the spicules develop into protective plates.

Bundles of spindle-shaped spicules form the supporting structure of monaxonid sponges; they are frequently held together by a horny material—spongin.

The higher of the horny sponges, e.g., *Euspongia*, are free from spicules and form the sponge of commerce. Horny fibres are produced by the co-operative action of a number of mesoderm cells which deposit the material of the fibre, and thus both the thickness and length increase. In the curious sponge, *Darwinella*, spicules of horny material are found. Horny sponges growing on rocky shores may consist of spongin alone, but the same sponge on a sandy shore may accumulate sandy particles on its adhesive surface to such an extent as to conceal the spongin almost entirely.

Finally, Professor Stewart drew the attention of his audience to cases of symbiosis between sponges and hydrozoa, in which, as in symbiosis in the plant world, mutual advantage results from such co-operation. Symbiosis, he said, might also occur between sponges and seaweeds.

The objects exhibited under the microscope were chiefly sponge-spicules, as for instance the hooked spicules of *Hymedesmia*, plate spicules of *Discoderma*, articulating skeleton spicules, tetractinellid spicules, etc. Specimens were also shown of *Ephydatia fluviatilis*, *Dendrilla rosea*, *Marchesettia spongiformis*, *Dysidea*, etc.

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

A goodly audience assembled on the 8th inst. to hear Dr. Sims Woodhead discourse upon the "Antitoxin Serum Treatment of Diphtheria." At the outset the microscopic characters of the diphtheria bacillus were figured and described. The organism seems often to assume a more or less oblong shape, more developed at the extremities than at the periphery, but modifications often occur by which it becomes wedge-shaped, pointed, or curved. The diphtheria bacillus, which is characteristic of the disease, is always found upon the leathery or false membrane of the throat. Dr. Woodhead stated that, although he had investigated about 600 cases during the last five weeks, yet in nearly every instance these typical bacilli had been present, and always in the same position, that is to say, confined to that part of the throat where the local lesion, which follows the soreness, had taken place.

Reference having been made to the investigations of Klein in the bacteriological, and Martin in the chemical, departments of the subject, the formation of the diphtheria toxin was described. The inflammation of the mucous membrane of the tonsils and the upper part of the gullet and windpipe is, in fact, caused by the presence of the bacillus, already alluded to. As a result, an intensely virulent compound called the diphtheria toxin is formed, which afterwards becomes changed, being broken down into two less poisonous compounds, the first of which is still confined to the throat, the other being found in the spleen. On injecting a certain amount of this diphtheria toxin into the subject selected for experiment, certain disarrangements of the system will be observed, including rise of temperature, change of pulse, general fever, and also in many cases a peculiar form of paralysis which is due to the action of the less poisonous variety of the toxin, formed at a later stage.

Several photographs were shown on the screen to illustrate the appearance of nerves of animals poisoned with the toxin produced by the bacillus in the spleen. Now when the toxin is injected into an animal the effects, of course, vary with the dose. Normally they include the characteristic sore throat and inflammation of the surface of the mucous membrane. Obviously some method had to be devised of regulating the dose. This was effected by modifying or diluting the toxin so that the first dose did not produce a fatal result, but only caused a disturbance of the system. It was found that by using an old culture of the toxin, or one that had been treated with iodine and potassium iodide, a modified poison was produced which answered the purpose. Then the dose was gradually increased, the animal experimented upon gradually becoming immune to enormous doses just as a victim to the morphine habit does. This condition is supposed to be due to the power which certain cells of the organism have of accommodating themselves to the action of the toxin, in virtue of which the patient is protected from further attention on the part of the poison. The cells form or secrete a substance which is antagonistic to the action of the toxin or assume a condition which enables them to secrete it. The antitoxin serum is specially formed in the connective tissues or white blood cells.

Dr. Woodhead stated that he was very reluctant to accept the antitoxin treatment when it was first promulgated, having a very lively recollection of the disastrous results which attended a system of treatment which had been previously advocated for the disease. He was therefore enabled to approach the subject without any enthusiastic bias in favour of it. Various subjects were selected for trial of the treatment, and after rabbits and sheep had been discarded it was found that horses were by far the most suitable, as they were comparatively unaffected by moderate doses of the toxin, only local action ensuing. Independently of that, the serum obtained from horses does not change—it mixes well with diluents, it does not form albumin when excess is used. After the first local action has subsided the horses have splendid health; in fact, Dr. Woodhead caused some amusement by stating the difficulty they had had with them during the severe weather, as since they could not be exercised sufficiently they had become almost unmanageable.

The toxin is made by the following process:—The diphtheria bacillus, prepared artificially, is grown in a "broth" composed of $\frac{1}{2}$ per cent. sodium chloride and 2 per cent. peptone. This "broth," which must be faintly alkaline (as the bacillus will not grow in acid media), is contained in a flat-bottomed flask which has been sterilised. The mouth, which is about half-inch in diameter, is plugged with sterilised cotton-wool and fitted with a cork provided with tubes, also plugged at the ends with sterilised wool, to allow of the passage of a continuous current of sterilised moist air through the flask. The flask is then placed in a chamber kept at the temperature of the body. If air were not passed through only a small amount of toxin would be formed, but by its agency the fluid becomes cloudy at the end of twenty-four hours, indicating the formation of the poison. The toxin, though very virulent at first, gradually loses much of its activity. The lecturer then described briefly the method of administering the toxin to horses.

With regard to fixing some strength of the antitoxin serum, the English standards are made by comparison with the poisonous dose of the toxin itself on a standard guinea-pig. Thus an antitoxin serum of "100 strength" is such that $\frac{1}{10}$ C.c. of it would theoretically counteract 10 times the poisonous dose of diphtheria toxin administered to a guinea-pig of fixed weight.

After alluding to the good results which had attended Klein's investigation on the action of the serum as a prophylactic, Dr. Woodhead dealt with the statistics bearing on diphtheria. These showed an alarming increase in the number of cases and deaths during the last few years, the majority of cases of fatal results being amongst children.

Dr. Woodhead is sanguine of the success of the treatment, both as a preventive and curative agent. He alluded to the good results met with in its use in the wards. The patients, and especially the children were cheerful and presented a marked contrast to the old method of treatment. In conclusion, he deprecated the statement that the rash

sometimes met with during the course of treatment was caused by the serum; it was rather a natural outcome of the disease itself.

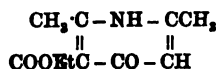
CHEMICAL SOCIETY.

A meeting was held on Thursday, February 7, the President, Professor Armstrong, F.R.S., in the chair. The following papers were read:—

THE ACTION OF HEAT ON ETHYLIC β -AMIDOCROTONATE.

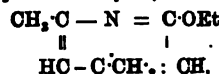
BY DR. N. COLLIE.

Ethylic β -amidocrotonate is the salt formed by the action of ammonia* on ethyl aceto-acetate and has the formula $\text{CH}_3\text{CNH}_2 \cdot \text{CH} \cdot \text{COOC}_2\text{H}_5$, and it has been shown that it yields by condensation pyridine derivatives. When ethylic β -amidocrotonate is purified by distillation in vacuo, there is always a small amount of a crystalline residue left in the distilling flask, which was shown to be ethylic dimethylpyridonem monocarboxylate of the formula—

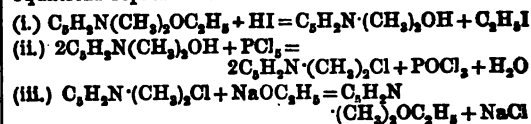


When the operation of heating is performed at the ordinary pressure, *i.e.*, in an open dish, about 50 per cent. is converted into a resin, which on distillation yielded a product from which three substances were separated, examined and identified.

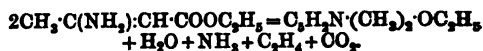
The largest portion was found to be a pyridine compound, the ethoxy-derivative of 2,4 dimethylpyridine—



since on reduction with hydrogen iodide it yielded ethyliodide and hydroxylutidine. The original substance was obtained from hydroxylutidine by chlorination with phosphorus pentachloride and subsequent treatment with sodium ethoxide. The following equations represent the reactions:—



The ethoxylutidine is formed by condensation of two molecules of ethylic β -amidocrotonate and elimination of water, ethylene, carbonic anhydride and ammonia.



The second substance examined was obtained from the resin by treatment with aqueous hydrogen chloride, when the substance is left as an insoluble oil. It proved on examination to be a derivative of dimethylpyrrol, $\text{C}_6\text{H}_5(\text{NH})(\text{CH}_3)_2$.

The remaining substance, which was only found in small quantity, was obtained crystalline from acetone, and is probably a true amido-hydroxy-pyridine. It has the formula $\text{C}_6\text{H}_5\text{N}_2\text{O}$, and yields methylpyridine with zinc dust, and is a monacidic base. An endeavour was made to prove the presence of the

* Vide J. C. S., 1891; Trans., p. 172, Part I.

amidogen group by diazotising, but decomposition occurred.

Four substances have thus been identified amongst the products of condensation by heat of ethylic β -amidocrotonate, namely (1) ethylic dimethylpyridonemonocarboxylate $C_{10}H_{12}NO_3$; (2) ethoxylutidine, $C_8H_8(CH_3)_2(OEt)N$; (3) dimethylpyrrol, $C_4H_8NH(CH_3)_2$; (4) probably amidohydroxy-picoline, $C_8H_8N(NH_2)(CH_3)(OH)(2,4,6)$.

THE ACIDIMETRY OF HYDROFLUORIC ACID.

BY PROFESSOR HAGA.

Experiments were made to determine the most suitable indicator to use in the titration of hydrofluoric acid. It was found that phenol-phthalein answered admirably with potash or soda, the colour being distinctly seen in the platinum dish. Rosolic acid answers as well as phenol-phthalein, and has the additional advantage of being able to be used with ammonia.

Cochineal and brazil wood answer fairly well, but methyl-orange is useless.

With litmus the colour change is somewhat complicated, though accurate results can be obtained by an experienced worker; the author, however, does not recommend the use of litmus. From experiments on the behaviour of the acid with litmus and alkali, it is probable that the molecule of hydrofluoric acid is polymeric and may be H_2F_2 or H_4F_4 .

REMARKABLE MOLECULAR CHANGE IN A SILVER AMALGAM.

BY MISS LITTLETON.

When silver amalgam is heated, swelling occurs, there is a notable increase of volume, and gas appears to be given off. It was found that the greatest increase of volume occurred when the amalgam was made of silver and mercury in the proportion required for $AgHg_4$. By heating in a vacuum it was found that no appreciable amount of gas was given off, and thus the change in volume and other appearances noted must be due to molecular change. A similar effect is noticed on heating potassium or sodium amalgams, and hence silver behaves in a similar manner in this respect to other metals in the same series in the periodic table.

THE COMPOSITION OF ANCIENT SILVER ORNAMENTS FROM PERU.

BY MISS WALKER.

Certain silver ornaments from graves in Peru were examined and the metal analysed. The metal consisted of about 85 per cent. silver, 13 per cent. copper, and 1.5 per cent of gold. Hence it is inferred that the silver used was a native silver, and that the practice of working up silver from the ores was posterior to the date of the ornament.

Another ornament examined appeared to be an alloy of iron, lead, and zinc, with silver, copper, and gold.

A paper on "The Electromotive Force of an Iodine Cell," by A. P. Laurie, M.A., was taken as read.

LINNEAN SOCIETY.

At the meeting on Thursday, February 7, Mr. W. Botting Hemaley, on behalf of the Director of Kew Gardens, exhibited dried specimens and floral dissections of a number of interesting new plants from Siam, Western China, and Formosa, collected respectively by Mr. F. H. Smiles, of the Royal Survey Department, Mr. W. Hancock, F.L.S., and Dr. A. Henry, F.L.S. We purposely omit the names because Mr. Hemaley has not yet published them. The most curious among these plants was described as a new genus of Scitamineae, a small plant having grass-like leaves and minute unisexual flowers enclosed in coloured bracts, and destitute of labellum and all other staminodia. It is a native of the mountains of Northern Siam, where doubtless many peculiar plants yet remain undiscovered. A large-leaved *Lysimachia* from the same region has the habit of *Saracha* in *Solanaceae*. The showiest plant among them was a *Jasminum* from Western China, with yellow flowers of large size and great substance, an ornamental plant almost worth a journey to China to procure. From Formosa there were some *Cyrtandra*, including a new genus, and new species of *Ventilago*, *Actinidia*, *Zanthoxylon*, *Mesona*, *Helicia*, etc.

Mr. Thos. Hanbury exhibited a large number of fruits from his garden at Ventimiglia, including several varieties of oranges, citrons, and pomeles, etc., and several curious fruits resembling snails (*Medicago scutellata* and *plagiopira*), and caterpillars (*Scorpiurus subvillosus*). Mr. Thos. Christy exhibited a curious Ohian drug named Llaleta, in which the stems formed a solid, compact mass; also fruits, bark, and exudation of the African kino tree (*Pterocarpus erinaceus*).

Provincial Transactions.

SHEFFIELD MICROSCOPICAL SOCIETY.

At a meeting of the above Society held on Friday, February 1, the President, Dr. Arthur Hall, occupied the chair, and the following paper was read:—

GRINDING AND PREPARING SECTIONS FROM HARD TISSUES.

BY W. B. TOLPUTT, L.D.S.

The lecturer dwelt on the various methods of cutting through the hard enamel of teeth, such as sawing and filing. He had been very much disappointed with the results given by those methods, and recommended the following process (although a wasteful one) until a ready means could be found of cutting through the enamel. A tooth is taken and held against the side of a revolving fine corundrum wheel till one side is ground flat, then that side is brought to the most perfect polish it is capable of receiving, on a piece of buff leather with some putty powder on it. Afterwards take a piece of stout glass and put a little oil and, consequently, tough Canada balsam on it, warm and spread it a little larger than your section. Let the balsam cool down until it is "tacky," then press the polished side of the tooth

into close contact with the glass, and clip it. When quite cold the grinding may proceed as in the first part of the operation till you get the required thinness, when that side may also be polished. The hard balsam round the section supporting and protecting the edges, they will not be fractured and made jagged and untidy. By not putting the tooth on to the glass plate until the balsam is somewhat cooled, the polished surface remains free from cracks, and the balsam does not run into the tubular structure of the dentine. Another method recommended by the lecturer was as follows:—A slice of dental or other hard tissue of moderate thickness is placed between a plate of ground glass and a flat stone (such as an Arkansas or Lake Washita stone), with water and a pinch of levigated pumice powder, and by a rotary motion of the upper glass, gradually rub the section down till it is thin enough for examination with even the highest powers of the microscope. But towards the end of the process the section should be carefully watched, for as the glass and stone, or the two glasses, get closer together, and the section thinner, one turn more of the upper glass will sometimes result in the total disappearance of an hour's work. Having ground the section sufficiently thin by either of the before-mentioned plans, it remains to be mounted in a suitable medium for examination.

The lecturer then went on to describe the decalcification process. Ohromic acid, he said, was most frequently used for this purpose, as it hardens the soft and softens the hard parts of the tooth, both changes taking place simultaneously. It was also useful for fully-developed human teeth, also for developing jaws of mammals in which a fair amount of dentine, enamel, and bone have been already formed. But for a handy and good all-round method there was nothing to equal a saturated solution of common alum acidified with hydrochloric acid, half a dram to each ounce. Steeping the tooth or teeth in this for about three weeks leaves the tooth with the consistency of cork. If it is now soaked in glycerin for a few days, it may be imbedded and cut into thin sections by any of the usual microtomes. As to the staining of hard tissues Mr. Tolputt mentioned logwood and borax-carmines as coming first in the list. In staining with chloride of gold it really did not matter whether the section be fresh or not. The method described by Dr. Bödecker had given the best results. He immersed the section, whether cut from a decalcified tooth or ground down from a hard one, in a solution of carbonate of soda for an hour. Then he placed it in a solution of chloride of gold (which must be neutral) and left in the dark for another hour; it was then placed in the carbonate of soda solution for a few minutes and transferred to a 1 per cent. solution of formic acid and kept warm over a bath for about an hour and a half. Finally the section was mounted in glycerin jelly, not in Canada balsam. Hard tissue sections after having been stained should be well washed and dehydrated, then cleared in either oil of cloves, cedar or bergamot, and finally mounted in the usual way.

On the motion of Mr. George Ellinor, seconded by Mr. B. W. Winder, a hearty vote of thanks was accorded the lecturer for his valuable paper.

THE CAMBRIDGE PHARMACEUTICAL ASSOCIATION.

On Friday evening, February 1, a lecture was given to the above Association in the chemical laboratory of the Technical Institute by Mr. Fred Stoakley, Teacher of Chemistry at the Technical Institute, on

(a) Diffusion of gases and application of gaseous diffusion.

(b) Liquid diffusion—dialysis—crystalloids and colloids.

(c) The detection of poisons in complex organic compounds by means of dialysis.

The lecture was illustrated by numerous successful experiments, by means of which the various processes were fully explained and the results proved.

Mr. Alderman Deck, F.C.S., occupied the chair, and at the conclusion of the lecture voted a very hearty vote of thanks to Mr. Stoakley, which was seconded by Mr. D. Greenwood, and carried with acclamation.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on the 7th inst., Mr. John Foster, Vice-President, in the chair, the Association was honoured by Mr. George Lunan, of Edinburgh, with a valuable contribution in a practical and well-considered paper entitled "Notes on Revision of the Pharmacopoeia." Members were rejoiced to see their President, Mr. W. L. Currie, again in their midst, though he preferred to let the duty of presiding over them rest in other hands. The Chairman having introduced Mr. Lunan, who was warmly greeted by the members, the paper was then read.

Messrs. John McMillan, Dunlop, Robb, the President (W. L. Currie), and the Chairman expressed their sense of the favour Mr. Lunan had done the Association, and made some general observations on the subject, and a hearty vote of thanks was afterwards accorded.

Correspondence.

OUR WEIGHTS AND MEASURES.

Sir,—Very much uncertainty seems to exist in the minds of most of us with regard to our weights and measures, more particularly in the relation of one to the other, and I think it is due to our semi-scientific training and especially to our Pharmacopoeia. It may be right, from a scientific point of view, that some sort of relation should exist between the grain and a fluid measure, such as the grain measure; but, from a practical point of view, so far as the medical man who orders, and the dispenser who executes the order are concerned, it seems to me quite wrong that a one per cent. solution should be one per cent. by a measure that the medical man never thinks of, and the dispenser never uses, namely, the grain measure. What use is it to the doctor to know

that liq. arsenicalis or liq. strychninae hyd. contains 1 grain in 100 grain measures, when such a measure is not used in compounding prescriptions? The Pharmacopœia recognises the right thing in ordering inj. morph. hypoderm., for, of it, the strength is not 1 grain in 10 grain-measures but 1 grain in 10 minims. The Committee seems indisposed to adopt the metric system by which all this vagueness would be overcome, but in view of a new edition of the Pharmacopœia and the same system being preserved for another decade, would it not be advisable to drop the grain measure from the formulæ by which our compounds and solutions are made, and reckon 480 minims to the ounce? No scientific accuracy would be lost, but a gain would be effected, as now we find quantities prescribed, varying from 87 to 90 grains per pint, to make solutions called one per cent solutions, and 9 grains to 16 fluid drachms in liq. strych. hyd. against 9 grains to 16½ fluid drachms in liq. atropinae sulph.

From this reasoning I would draw the two following deductions:—

1st. The grain measure should be expunged from the body of the Pharmacopœia, because it is not practical and is misleading.

2nd. That it is unnecessary in the Appendix, because the metric system is all that can be desired.

With regard to the second deduction there is the argument that some men have their apparatus graduated in decems., etc., and that they have a vested interest in the old system. These men are few, and they are familiar with the relation that exists between the two systems, so it is unnecessary to encumber the Pharmacopœia with special instructions for them. The vagueness and uncertainty is not confined to the medical man in the practice of his profession and the pharmacist in his calling, but it frequently crops up in our more scientific literature. Within this year I have seen in the *Pharmaceutical Journal* the factor 4·8 given by a very eminent investigator for the conversion of percentage into grains per ounce. No doubt it was a slip, but it is one that frequently arises, and in use produces a grave error, about 10 per cent. Again, within the last few weeks a writer in the *Lancet*, and a man whose name is known throughout the country, boldly asserted that one C.c. is equal to 15·432 minims, and refused to be convinced of his error. To remove the grain measure from the Pharmacopœia would not overcome these difficulties, but its tables of weights and measures should be more explicit on these points, and I would humbly suggest that such lines as the following should be inserted in their proper places:—

(1). A percentage solution in the body of the book means grains per 100 minims.

(2). A percentage solution in the Appendix means grammes per 100 C.c.

(3). The factor for converting metric percentages into grains per ounce is 4·375.

(4). 1 C.c.=16·981 minims.

A useful note for the dispenser to remember in dispensing foreign prescriptions and sufficiently accurate for most purposes is: 4 grammes=℥j., and 8½ C.c.=f.℥j.

Folkestone.

JOHN WARD STAINER.

PHENOL.

Sir,—I do not know that a reply to Mr. Dott's letter (*ante*, p. 600) is necessary. It may be permitted to me, however, to point out that my remarks were not on the method of determining the boiling point of a liquid speaking generally, but of carbolic acid in particular. The sug-

gestion of placing the bulb of the thermometer in the liquid was made because it had been found practically useful, and if adopted in the Pharmacopœia might lead to uniformity in this determination, a great desideratum when one considers the various (and as Mr. Dott says, faulty) methods which it is possible to use. Commercial carbolic acid is a very good article, but it is not chemically pure. What is wanted is the temperature at which the mixture is in a state of ebullition, and that I think may be obtained by the method indicated. Of course when dealing with a pure substance the thermometer must be placed in the vapour. The object of the note was to show the necessity for increased stringency in the tests for carbolic acid, and not to advocate any special method of determining the boiling point, so long as a definite method is given. I would like to repeat what I said in my paper, that for various reasons the melting point is of much greater value than the boiling point as a test for the degree of purity of commercial carbolic acid.

Edinburgh.

GEORGE COULL.

PHARMACY IN DEMERARA.

SIR,—In a recent letter from a corresponding member of the Society, Mr. G. W. Hawtayne, C.M.G., F.R.G.S., Administrator-General of British Guiana, the following remarks are made bearing upon an article published in the *Pharm. Journ.*, December 8, on "Pharmacy in Demerara." These remarks seem intended as a correction, and I have therefore ventured to hand them to you for publication.—"In the Journal article of December 1 on 'Pharmacy in Demerara' the writer has made some mistakes. Opium and ganjah are largely imported and largely consumed by the East Indian immigrants (105,000), and there is a duty of 16s. 8d. per lb. levied. The importer has to pay £100 as annual licence, and the retail dealer pays £4 13s. 4d. licence per annum. I cannot give you the amount yearly imported, but the quantity is large, and it used to be, and no doubt is, smuggled. It is necessary in order to protect these dealers that chemists and druggists should not be allowed to compete with licensed dealers. The retailers have to keep books showing sales, and are closely watched by the Commissioners of Taxation. . . . I agree with you as to the laxity about qualification of chemists, and not very long ago I was served in a shop by the porter who took down the bottle I pointed out and sold me an ounce of what I wanted."

17, Bloomsbury Square, W.C.

E. M. HOLMES.

DR. BRUNTON ON PHARMACOPŒIA REVISION.

SIR,—The article by Dr. Brunton on the approaching revision of the British Pharmacopœia will doubtless attract considerable attention, and ought to receive the most earnest and careful consideration of every pharmacist. I have carefully read—and re-read—the article, and can only conclude either that pharmacists generally have a very mistaken and erroneous idea of their position in medicine, and their relation to the medical profession and to the Pharmacopœia; or else that Dr. Brunton is himself very wide of the mark. And I think the latter is the case.

I cannot, in the first place, understand his conclusion that because the object of the Pharmacopœia is stated to be "to afford to the members of the medical profession and those engaged in the preparation of medicines throughout the British Empire, one uniform standard and guide whereby the nature and composition of substances to be used in medicine may be ascertained and determined," therefore it is intended "primarily" for the members of the medical profession, and "secondarily"

only for chemists and pharmacists. I suppose that where two classes of persons are specified, one class must come first, but precedence in order does not necessarily imply any superior or primary, let alone exclusive, claim to consideration. Moreover, the very fact that the main object of the Pharmacopœia is stated to be to ascertain and determine "the nature and composition of the substances to be used in medicine" indicates pretty clearly that the Pharmacopœia must of necessity touch the pharmacist in his life-work far more closely than it does the medical man.

Dr. Brunton unconsciously emphasises this very point when he states that "in the consulting rooms and libraries of doctors in general the British Pharmacopœia is generally conspicuous by its absence," whilst the same fact serves to explain where the "thousands of copies issued by the Medical Council," concerning the destination of which Dr. Brunton expresses such bewilderment, have really gone. Perhaps Dr. Brunton would be able to give us an estimate of the number of medical men in this country who are in the habit of endeavouring to ascertain the nature and composition of the substances they use in medicine, and he might, at the same time, offer his opinion on the question as to whether this is not the work for which the pharmacist is specially qualified, which is, in fact, the great reason and justification for his existence. It is well to have placed on record the fact that the Pharmacopœia is of little or no use to medical men; and it may be of service to place alongside it the further fact that it is the one book which is essential in every pharmacy, and the one which the pharmacist is in daily, almost hourly, need of consulting.

All pharmacists will agree with Dr. Brunton's opinion that the British Pharmacopœia is still far from being perfect. But if it is imperfect from the standpoint of the medical man, it is quite as much, if not more so, from that of the pharmacist and public analyst, both of whom have a claim to consideration in the matter of revision, second only to that of the members of the medical profession.

But whilst agreeing with Dr. Brunton that the Pharmacopœia is in considerable need of improvement, I am just as certain that any attempt made to improve it on the lines laid down in his article would not only entirely alter its character, but would also tend to seriously impair its efficiency for the purposes for which it is published. The proposals of Dr. Brunton are distinctly retrograde in their character, and to accept his suggestions would simply be to make the national (or Imperial) Pharmacopœia a sort of repository for hints on the storage of drugs, precautions as to admixture and incompatibility, instructions as to how certain remedies may best be administered, with appropriate therapeutic notes on the action of different medicines. I think the opinion of pharmacists generally will be that the Pharmacopœia should not be degraded into an instrument for supplying what is lacking in the education of medical men. Surely such elementary knowledge as that sketched in Dr. Brunton's article might be acquired during a five years' curriculum of study at a medical school without the necessity of over-burdening the already overcrowded pages of the Pharmacopœia. But if such a *vade mecum* be really required by physicians, it might be a question worth consideration as to whether the purpose would not best be served by publishing the Pharmacopœia in two volumes, one for the use of medical men and the other for pharmacists. With some of Dr. Brunton's ideas I am quite in accord.

The introduction into the Pharmacopœia of such preparations as cachets, capsules, granules, and tablets (and I might add glycols, an extremely useful form of medication) would be a boon both to medical men and pharmacists.

The system of standardisation should be extended and developed. In connection with this subject a vast amount of work has been done on the pharmaceutical side, and there is ready to hand an accumulated mass of results which only need checking on the physiological side before being available for use by the Pharmacopœial committee. Many official remedies are out of date and might be dropped. Some of the B.P. processes, in addition to those for the production of the two obsolete preparations mentioned in Dr. Brunton's article, require modification and revision, and the use of the metric system of weights and measures ought to be legalised.

As for the purely pharmaceutical portion of the work involved in the production of the forthcoming Pharmacopœia there is no doubt that in the hands of the committee nominated by the Pharmaceutical Council it will be thoroughly and efficiently done. The annual reports sent in to the Medical Council by the official reporter bear eloquent testimony to the fact that the pharmacists of this country are playing a not unworthy or unimportant part in developing and perfecting the art and practice of pharmacy. And it is not too much to affirm that in carrying out any proposals which may be made for the improvement of the Pharmacopœia on the pharmaceutical side, British pharmacists will be found quite equal to the occasion.

Buston.

R. WRIGHT.

TABLOIDS AND THE NEW BRITISH PHARMACOPŒIA.

Sir,—May I ask your correspondent "Galen," in your issue of February 9, to differentiate between pills and tabloids, or tablets? The bulk of the B.P. pills are now supplied by wholesale galenical preparation manufacturers and are simply dispensed according to label. If dispensing chemists are to be considered as the pharmaceutical cooks, why are the mass of the galenical preparations purchased in bulk and dispensed in good faith as of the "substance and quality demanded" without further proof? It appears to me your correspondent is merely "straining at the gnat."

"GALENICAL."

Correction.—In Mr. Kemp's letter, published last week on page 684, for "Pharmaceutical Councillor" read "Pharmaceutical Chemist."

Notices to Contributors.

*** Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication is desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.*

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

COMMUNICATIONS received from Messrs. Botlle, Bullen, Clarke, Clay, Dyer, Ellis, Everett, Freund, Jesper, Kemp, Kirkley, Kirkpatrick, Messter, Moffatt, Naylor, Sutton, Wellcome, Wright.

"THE MONTH."

Titanium and its Compounds. H. Moissan obtains blue titanium protoxide, titanium nitride, Ti_3N_2 , metallic titanium, and crystallised titanium carbide, TiC , by heating a mixture of titanic acid and carbon in the electric furnace. The metal itself is the most refractory substance yet obtained by this means, being more infusible than vanadium, and considerably more so than chromium, tungsten, molybdenum, and zirconium. Its properties, regarded as a whole, resemble those of the metalloids, and more particularly silicon (*Comp. rend.*, cxx., 290).

Reactions of Chelidoniine. M. Battandier mixes a drop of guaiacol and about 0.5 C.c. of sulphuric acid (s. g. 1.84) at the bottom of a porcelain capsule, then places small pieces of chelidoniine near the edge, and in a few moments bright carmine streaks of great intensity descend from the pieces, the reaction persisting for some time. With guaiacol carbonate the coloration is less intense. When the guaiacol is replaced by thymol, a rose coloration is obtained, which lasts for more than twenty-four hours, and only becomes slightly purple as hydration of the acid takes place. The chelidoniine should be introduced before the acid gives a blue colour with the thymol. Ordinary phenol gives only a slight rose tint with chelidoniine and sulphuric acid; oil of cloves gives a purple colour; naphthol, dark green streaks; β -naphthol, brown streaks passing to violet; pyrocatechin, a rose colour passing to violet; hydroquinone, resorcin, and phloroglucin, yellowish streaks; pyrogallol, red turning to yellow, and then disappearing; and gallo-tannic acid, yellow passing to bright green. All oxidising agents produce the same green coloration as nitric acid when added to chelidoniine dissolved in sulphuric acid (*Comp. rend.*, cxx., 270).

Dimorphism of Cinchonine. Jungfleisch and Léger find that this isomer of cinchonine, which has a specific molecular rotatory power, is not only dimorphous but that the two forms readily change into each other. The clinorhombic form is stable at the ordinary temperature, whilst the orthorhombic form is the same at the boiling point of ether, about 35°. Some twenty degrees, therefore, constitute the difference between the temperatures at which crystallisation takes place in the two cases. Hydrate of cinchonine can be obtained in prismatic crystals containing two molecules of water by heating the anhydrous base (m.p. 129°) with water. Cinchoniline, a close isomer of cinchonine, also forms a hydrate, which occurs in fine needles containing three molecules of water (*Comp. rend.*, cxx., 325).

Lactate of Methylene. L. Henry describes an ethereal salt of a new kind, methylene lactate, obtained by the action of lactic acid upon formic aldehyde. It is a colourless liquid with a strong odour recalling that of the aldehyde, its density at 2.5 is 1.197, and it boils at 153°-154° under a pressure of 754 Mm. Its pour density was found to be 3.47, and its empirical formula is $C_4H_6O_3$. The ether is readily aged into a crystalline mass which melts at about -28°. It is insoluble in water, but when warmed with that liquid decomposes into lactic acid and formic aldehyde (*Comp. rend.*, cxx., 333).

Boron Steel.

Moissan and Charpy have recorded some experiments made with an alloy of steel and boron, chiefly with a view to comparing the effect of the latter on the hardness, temper, etc., of the alloy as compared with steel containing carbon only. The boron steel was prepared by heating pure amorphous boron with reduced iron, in the proportion of 1 to 9. This boride of iron was then added to very soft steel previously melted, and the mixture twice fused. The alloy was found to contain .58 per cent. boron, .17 carbon, and .3 manganese, with traces of silicon, phosphorus, and sulphur. In physical properties it closely resembled soft steel. In tenacity, however, it equalled hard steel, upon which no impression could be made by a file, the boron steel being malleable and easily cut with a file. A table is given showing the breaking strain for wires of equal dimensions of boron steel, soft steel, and hard steel respectively (*Comp. rend.*, cxx., 130).

Boride of Iron.

A crystalline compound, having the formula FeB , has been prepared by H. Moissan by fusing together boron and iron in an electric furnace. To remove uncombined iron, the fused mass, after cooling, is treated with diluted hydrochloric acid, in which the boride of iron is insoluble. It is described as occurring in brilliant crystals of a yellowish-grey colour, having a density of 7.15 at 18° C. The composition of the crystals was determined by acting upon them with nitric acid, which dissolved the iron as nitrate and converted the boron into boric acid. The latter was extracted by methylic alcohol, treated with a known weight of quicklime, and weighed as borate of calcium, the iron being precipitated and weighed as oxide. The properties of the new compound are described, and reference is made to other borides, as well as analogous compounds of silicon and carbon. The author suggests that these bodies may provide useful data for determining the valency, etc., of the elements concerned (*Comp. rend.*, cxx., 173).

Kjeldahl's Process.

M. Delépine finds that the determination of nitrogen in chloroplatinate of trimethylamine by Kjeldahl's method yields results below those calculated from the formula of the body. The nitrogen in ammonium chloroplatinate was also determined with a similar result, less than one-third of the nitrogen known to be present appearing in the distillate as ammonia. The deficiency is attributed to chlorine from a portion of the chloroplatinate acting upon the rest, with formation of free nitrogen (*Comp. rend.*, cxx.).

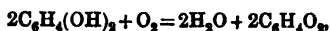
Separation of Zinc, Copper, etc.

H. N. Warren suggests a new method for separating zinc from copper and other allied metals, which consists in dissolving the alloy in strong sulphuric acid, adding a few coils of magnesium tape, and maintaining the solution at about 100° F., until the whole of the copper is precipitated. If tin, antimony, or other metals of the same group are suspected, the copper precipitate must be further examined. Any free sulphuric acid in the filtrate should then be neutralised by adding a strong solution of sodium acetate and raising to boiling point, when any iron present will be precipitated as tribasic acetate, whilst the zinc sulphate will be converted into acetate. Thick sheet or rod magnesium is next added to the solution, and

hydrogen is evolved simultaneously with the entire precipitation of the zinc (*Chem. News*, lxi., 92).

Arabinochloral and Xylochloral. M. Hanriot, continuing his researches on the combinations of sugars with chloral, describes the production of the above compounds from chloral and arabinose and xylose respectively, in presence of a trace of hydrochloric acid. From arabinose two isomers, α - and β -arabinochloral, were obtained, having the empirical formula $C_7H_9Cl_3O_5$. The β -variety is deposited first, and has a melting point of $183^\circ C$. In its general behaviour it resembles β -glucochloral. Triacetyl and dibenzoyl derivatives were prepared from it. The mother liquor from which the β -compound was obtained yielded the α -arabinochloral, melting at $124^\circ C$. This was found to be much more soluble in ordinary solvents than its isomer. The dibenzoyl derivative was prepared, but the acetyl compound could not be obtained in a pure condition. Only one variety of xylochloral was obtained, the author suggesting that his failure to separate the possible isomer might be due to its solubility in the syrupy mother liquor. The xylochloral prepared melted at $132^\circ C$, and was much more soluble in water than arabinochloral. A graphic formula is given which accords with the formation of the triacetyl derivatives and a monobasic acid having the formula $C_7H_7Cl_3O_5$ (*Comp. rend.*, cxx., 153).

Laccase and Laccol. G. Bertrand has previously shown (*Ph. J.* [3], xxiv., 1087) that the latex of the Tonquin lacquer tree contains a ferment which causes it to oxidise rapidly when exposed to the air, and thus renders it insoluble in the usual solvents. This laccase seems to act by inducing oxidation of an alcohol-soluble oily liquid, termed laccol, which possesses energetic rubefacient properties. The laccol, in turn, appeared to be connected with certain polyatomic phenols, and experiments were therefore performed with hydroquinone and pyrogallol, with a view to ascertaining how the laccase acted. In both cases oxidation was definitely proved to take place in the presence of laccase, though no such change occurred in check experiments without laccase. The hydroquinone was converted into quinone and water, thus—



and pyrogallol was oxidised to purpurogallin, carbon dioxide being involved in proportion to the amount of oxygen absorbed. Micro-organisms were excluded by the conditions of the process adopted, and the existence of an oxidising diastase seems to be established (*Comp. rend.*, cxx., 266).

Adulteration of Commercial Peptones. L. Hugouenq, in the examination of some samples of commercial peptone, found two which reduced Fehling's solution, and on further examination proved to contain about 33 per cent. of milk sugar. One of these samples bore the name of a firm of good repute, while the other emanated from a less known source. That the sugar present was lactose was confirmed by the examination of the ozonide prepared from it. The total nitrogen of one of the samples amounted to 8.34 per cent., while a good sample of unadulterated peptone yielded 12.72 per cent. (*Journ. de Pharm.* [6], 1, 178).

Alumina in Plants. Berthelot and André deal with the presence and distribution of alumina in plants, and find that it may exist in the ash of animal plants provided with abundant and deep roots, in a proportion comparable to that of other bases present. An analysis of the roots of lucerne, dried at 110° , yielded 0.5 per cent. of pure alumina, whilst convolvulus roots contained 0.4 per cent., and the leaves of the lupin and lime yielded 0.037 and 0.0025 per cent. respectively. The bulk of the alumina absorbed is retained by the roots (*Comp. rend.*, cxx., 288).

Glycolytic Ferment. R. Lépine describes the production of a glycolytic ferment by macerating the ground-up pancreas of a dog, removed with aseptic precautions, for two or three hours at $38^\circ C$, with 100 C.c. of water containing 2 Gm. of sulphuric acid. The acid was then neutralised with soda, 5 Gm. glucose added, and the mixture set aside at $38^\circ C$. By determining the amount of sugar at the end of one hour's digestion, a considerable quantity, from 10 to 50 per cent., was found to have disappeared. This is a much larger proportion than is observed when glucose is added to an unacidulated maceration of pancreas. The author concludes that this glycolytic ferment is formed by the action, probably hydrolytic, of the acid on some zymogenic substance in the pancreas. This substance is probably the diastase ferment, and the very similar behaviour of malt diastase and saliva when treated with 1 per 1000 sulphuric acid is mentioned as supporting this view. That the experiments were conducted aseptically was proved by the fact that a drop of the mixture placed in bouillon remained sterile. The disappearance of the glucose could not therefore be due to bacterial action from external contamination (*Comp. rend.*, cxx., 139).

Varieties of Chlorophyll. A. Étard has previously shown that the green colouring matter of phanerogamous plants consists of a mixture of pigments, and he now points out that chlorophyll may be more or less blue, green, or yellow, according to the plants from which it is obtained and the treatment to which it has been subjected. He finds that lucerne (*Medicago sativa*) contains several distinct chlorophylls, amongst others α -medicagophyll, $C_{42}H_{64}NO_8$, and β -medicagophyll, $C_{42}H_{62}NO_8$. Certain chlorophylls soluble in pentane are by their decomposition in the plant cells the cause of the formation by chemical means of essences and oils. Others, again, which are not so soluble, mix with water. These are very rich in oxygen, and decompose to produce carbohydrates, tannins, etc. (*Comp. rend.*, cxx., 328).

Phosphorus in Vegetable Tissues. According to Dr. G. Pollacci, phosphorus is universally present in vegetable tissues, and is indispensable for certain vital processes. It is absent from the cell-wall, but present, in appreciable quantities, in the protoplasm, and especially in the chromatin granules of the nucleus. It occurs also in the hyphæ and spores of fungi. In the vegetative organs of the higher plants it was found accumulated especially in the meristem and in the conducting tissues. The parts of the flower most rich in phosphorus are the ovules and the pollen-grains; the nucleus of the reproductive cells contains a much larger quantity than that of the vegetative cells. In seeds it is stored up especially in the embryo (*Malpighia*, 1894, pp. 361-379).

Poisonous Principle in the Cactaceae. In *Anhalonium lewinii* and in some other species of Cactaceae, Herr L. Lewin finds a poisonous alkaloid to which he gives the name *anhalonine*, resembling strychnine in its properties. It was found also in other species of *Anhalonium*, and in *Mammillaria uberiformis*, in *Cactus fimbriatus* and *pentagonus*, and in *Cereus flagelliformis*; while other species of *Mammillaria* examined were not poisonous. The formula of the chloride is given as $C_{15}H_{11}NO_3HCl$ (Ber. Deutsch Bot. Gesell., 1894, pp. 283-290).

Syrup of Iodide of Iron. Ém. Bourquelot recommends a method of determining the amount of ferrous iodide in this preparation, which he describes as a modification of that contained in the U.S. Pharmacopoeia. It consists in adding excess of silver nitrate to the diluted syrup, and then determining the amount of silver unprecipitated, by means of decinormal solution of ammonium sulphocyanate. In discussing the subject generally M. Bourquelot gives a table showing the percentage of iodide of iron contained in the syrup of fourteen national pharmacopoeias, the Greek containing the least, '052 per cent., and the Dutch most, 20 per cent., the latter being therefore 385 times stronger than the former, while the German is ten times stronger than the French syrup (Journ. de Pharm. [6], i, 170).

Succinits. E. Aweng has investigated the constituents of that variety of amber known as succinite. This resin, which is formed in the stem and branches of *Pinites succinifer*, appears to be of both physiological and pathological origin. From 20 to 25 per cent. is soluble in alcohol, and consists principally of free succino-abietic acid, together with a small quantity of the same acid combined with borneol, representing probably the last trace of the volatile oil of the amber tree. By fusion with caustic potash succino-abietic acid is partially converted into succinic acid. That part of amber which is insoluble in alcohol, and has been termed succinin, proved to be insoluble in all the menstrua experimented with. Weak alcoholic solution of potash slowly decomposed succinin into succinic acid and a resinol, succino-resinol. The only solvent that could be found for this body was a mixture of ether and alcohol; its formula was determined to be $C_{10}H_{10}O$. Other varieties of amber were also examined. Gedanite appears identical in composition with succinite; glessite also resembles the latter, but contains a body resembling in odour carvol in the place of borneol; allingite on the other hand contains neither borneol, succinic acid, nor succino-abietic acid (Archiv. d. Pharm., cxxxii., 660).

Saligenin. Lederer suggests the use of saligenin in the place of salicin, on the ground that the former is in all probability the active constituent of the salicin, in which it is present to the extent of only about 43 per cent. By this means the organism would be relieved of the labour of splitting up the salicin into saligenin and sugar. Saligenin is now made by Von Heyden's patent from carbolic acid and formaldehyde, but experiments are still wanting to show what its physiological action may be (Ther. Monatshefte from Med. Wochenschr., xli., 619).

Ferripyrrin. A new hæmostatic and astringent has lately been put forward under the name of ferripyrrin. It is a compound of ferric chloride and antipyrin represented by the formula $Fe_2Cl_6 \cdot 3(C_{11}H_8N_2O)$, and is obtained in the form of an orange-red powder yielding with water, in which it dissolves with facility, a dark red solution. It possesses excellent hæmostatic properties, is free from any causticity, and can be used either as a powder or in the form of a 20 per cent. solution, in all cases in which ferric chloride is indicated. Ferric pyrrin may also be administered internally in doses of '5 Gm., and may possibly prove valuable as an injection (Münch. Med. Wochenschr. xlii., 10).

Dermatol as an Antiseptic. Dermatol (basic gallate of bismuth) is said by O. Wiemer to be superior to all other antiseptics in inducing union of the edges of wounds and not producing any inflammatory symptoms. Too indiscriminate use of the powder may, however, cause symptoms of bismuth poisoning (Therap. Monatshefte, ix., 15).

Aïrol. F. Lüdy gives this name to an oxy-iodo-gallate of bismuth. It is a tasteless greyish green powder, unaffected by light, but gradually decomposed by water or moist air. Though insoluble in the ordinary solvents, it dissolves readily in sodium hydrate solution and in dilute mineral acids. It forms an emulsion with glycerin and water, which does not decompose readily, can be made into stable ointments with soft paraffin or anhydrous wool-fat, and also mixes well with cacao butter. Employed in the state of powder it has been used with success in cases of ulcerated legs (Aptot. Zeit., x., 63).

The Nascent State. Dr. Launcelot Andrews shows that, contrary to the general belief, the presence of moisture is not a necessary condition to the bleaching of organic colouring matters by the halogens, and concludes that the presence of any solvent whatever for either the halogen or the colouring matter would probably suffice to cause bleaching to take place. In the course of experiments bearing on the nature of the changes which occur when nitric acid is reduced to ammonia without production of hydrogen, he finds that whilst nitrates in alkaline solution are not reduced to ammonia by stannous hydrate, also in alkaline solution, yet the less stable nitrites are abundantly reduced. It is thought possible that a quantitative method for the separation of nitrites from nitrates, and the determination of the former, can be based upon the results of these reactions (Chem. News, lxxi., 80).

Low Temperatures and Magnetic Power. R. Pictet has investigated the influence of low temperatures upon a permanent horseshoe magnet weighing 493.5 Gm., and formed of three pieces. When originally magnetised it had supported an armature weighing 4275 Gm., but in the course of years the weight it was capable of suspending was reduced to 3226.5 Gm. The effect of cooling the magnet was to increase the force of its magnetic attraction. Thus, at a temperature of 30°C. this force was equivalent to 57.31 Gm., whilst at zero it was increased to 61.04 Gm., and at -105° to 76.64 Gm. (Comp. rend., cxx., 263).

THE CASTOR OIL TRADE AND SEED OF INDIA.

BY P. L. SIMMONDS, F.L.S.

This oil has made wonderful progress in British India, the chief seat of production. It is doubtful whether the plant is indigenous there, or if it is not rather a native of Africa.

There are three kinds of castor oil met with in commerce, that expressed from imported seeds in London, East Indian, and American. It would be difficult to define how much is used in medicine, because it has various other uses. It is employed for lubricating, as a lamp oil in India and China, for greasing steam engines, and in Siam for lubricating the steam rice mills. The Chinese have some mode of depriving it of its purgative properties, and use it for culinary purposes; hence it is largely employed in the Mongolian and Manchourian kitchens.

Castor oil is used by the Jews for their Sabbath lamps, under the name of "Kiki"; it gives a brilliant light and free from smoke.

The best medicinal oil is obtained by hydraulic pressure, the decorticated seeds not being subjected to heat. About 350,000 bushels of castor seed are grown yearly in the United States, and there were seven establishments engaged in pressing the seed, producing oil, according to the last census (1890), to the value of 650,000 dollars.

Castor oil is very little employed medicinally in China, as it does not purge Chinamen much. Newchwang is chiefly noted for the production of castor oil.

There are two main types of the plant. The one a tall tree or small bush, and the other an annual.

Our imports of castor oil were in—

	lbs.
1831.....	893,191
1841.....	871,136
1851-3.....	429,760

We imported from India in 1846 only 8315 cwt. of oil; in 1852 about 48,480 cwt., valued at £106, 129; in 1856, 29,411 cwt.; it was then worth £2 15s. the cwt.

This dropped to about 21,000 cwt. in 1860, and to 19,013 cwt. in 1865, worth £49,379.

From 1850 to 1880 the Indian exports expanded from 100,000 gallons to nearly 3,000,000 gallons.

The distribution of the Indian castor oil since then has been as follows in the financial years ending in March:—

Years.	To United Kingdom.	To Australia.	Other Countries.	Total.
				Gallons.
1881	1,775,074	679,591	436,338	2,890,803
1882	—	—	—	3,009,288
1883	—	—	—	2,571,588
1884	—	—	—	3,102,063
1885	—	—	—	3,207,046
1886	—	—	—	2,190,888
1887	1,182,853	—	—	2,676,012
1888	1,066,102	—	—	2,677,005
1889	769,168	681,836	641,814	2,092,913
1890	783,550	1,005,781	876,670	2,664,990
1891	1,101,604	1,200,078	855,807	3,157,489
1892	1,384,745	1,037,904	851,331	3,273,980
1893	1,333,086	678,807	767,099	2,778,992
1894	958,759	545,262	790,628	2,294,644

From the above figures it will be seen that Australia, which took in some years one-third of the quantity produced, has dropped to less than one-half that amount. Other foreign countries keep pretty steady, and the British supply is about one half. But as a gallon of oil weighs nearly 10 lbs., it would appear that the exports of seed would have afforded over 4,300,000 gallons, so that in the last cited year India could have actually furnished nearly 7,000,000 gallons of oil, if all the seed shipped had been pressed there.

After the United Kingdom and Australia, the balance of Indian castor oil shipped goes to the Straits Settlements, Hong Kong, Mauritius and Ceylon, in quantities ranging from 80,000 to 250,000 gallons. That castor oil has felt the effect of the modern use of mineral oils as lubricants there can be no doubt, but the demand for the oil in the aggregate has not been seriously diminished.

The aggregate value of the castor oil, shipped from India, has not varied greatly in the last eight years; it has sometimes run up to £350,000; but, on the whole, more attention is given now to the shipments of the seed.

The value of the shipments of castor oil from India, taking the rupee at 2s, was as follows. The financial year, it should be noted, ends in March, not in December as with us:—

	£
1887.....	271,837
1888.....	264,282
1889.....	203,147
1890.....	328,316
1891.....	373,365
1892.....	342,123
1893.....	266,747
1894.....	236,902

The export of castor seed from India has been as follows in the past fifteen years:—

Years.	Total Cwts.	To United Kingdom. Cwts.
1880	237,601	—
1881	76,461	22,023
1882	250,696	—
1883	222,156	—
1884	512,444	—
1885	476,396	—
1886	670,537	—
1887	610,893	71,404
1888	764,293	104,724
1889	585,796	85,710
1890	894,631	237,388
1891	859,772	189,733
1892	835,925	81,229
1893	989,534	132,468
1894	1,107,754	80,986

The seed exporting Indian provinces were—

	1891. cwt.	1890. cwt.
Bombay	59,691	565,764
Madras	16,257	325,741
Bengal	513	3,124
	76,461	894,629

The trade was not separately returned until the year 1878; the exports were previously mixed up with other oil seeds.

The principal receiving countries for the seed were—

	1881. Cwts.	1890. Cwts.
Italy	47,760	81,867
United Kingdom	22,023	237,388
France	—	450,301
Russia	—	62,958
Belgium.....	—	43,785
	69,783	876,299

CUBEBS AND ITS ADULTERATIONS.*

(Continued from p. 316.)

4. *Piper ribesoides*, Wall.—The fruit has a diameter of 7 mm., and the pedicel a length of 7-8 mm.; it therefore closely resembles the true cubebs, var. *crassipes*, De Wevre, in size. It differs in its bitter, only faintly aromatic, but not burning, taste. Its chief histological peculiarities are the presence of rhombic crystals in the epidermal cells; the irregular arrangement of the hypodermal stone cells, which are sometimes in one row, sometimes in two, or in small groups; and in the presence above the endocarp of large, crescent-shaped lysigenous lacunæ, which have their upper surface more or less lined with stone cells, but few of these cells on the lower surface. The parenchymatous cells form three or four rows between these lacunæ and the endocarp, but between them form about ten rows. The endocarpic cells form two or three rows, and are polygonal, with thick, porous walls, and enclose one or more large rhomboid, prismatic crystals. De Candolle has identified *P. ribesoides* with *Cubeba wallichii*, and it is interesting to note that the *Cubeba wallichii*, of Wallich's herbarium, has the structure here described as that of *P. ribesoides*, Wall. A specimen of *P. ribesoides*, of Falconer's herbarium at Kew, was found, however, to differ in having the endocarpic cells of an elongated prismatic form, and arranged in a single line. (*Ph. J.* [3], xxiii., pp. 121, 734.)

5. *Piper crassipes*, Kortb.—A specimen in the Kew Herbarium, from Miquel, has been examined. Owing to the bad condition of the fruit, which would not afford a good section, it was difficult to see the structure clearly, but, so far as Dr. De Wevre could make it out, it is absolutely identical with that of *P. ribesoides*. He does not appear, however, to have compared the leaves of the two plants.

The "*Piper crassipes*," or large false cubeb of English commerce, is thus described:—

A large, globular, brown or blackish fruit borne on a curved pedicel, usually at least twice as long as the fruit; the pedicel is not flattened, sometimes tapering, but never dilated at its free extremity. The fruit measures 7-8.5 mm., and the pedicel 12-23 mm.

The taste is bitter, but does not leave a persistent burning sensation in the mouth. Sulphuric acid gives with the crushed fruit a yellow coloration.

* Abstract of paper by Dr. A. De Wevre.

The structure of the fruit resembles that of *P. crassipes* and *P. ribesoides*, but the lacunæ do not occur in the epicarp (*Ph. J.* [3], xviii., p. 269-270, Figs. 1, 2, 3).

6. *Piper sumatranum*, D.C.—The fruit examined were those in the Kew Herbarium from the collections of Heavy and Maingay, the latter having been determined by De Candolle. The structure in both was identical with that of *P. ribesoides*, they possess the same lacunæ, and the endocarp is formed of irregularly prismatic cells.

7. *Cubeb* with short pedicel.—Dr. De Wevre has found in commercial cubebs a *piper* with a short pedicel. The fruit is about 4-5 mm. in diameter, and the pedicel 1 mm. The fruits are feebly aromatic, but

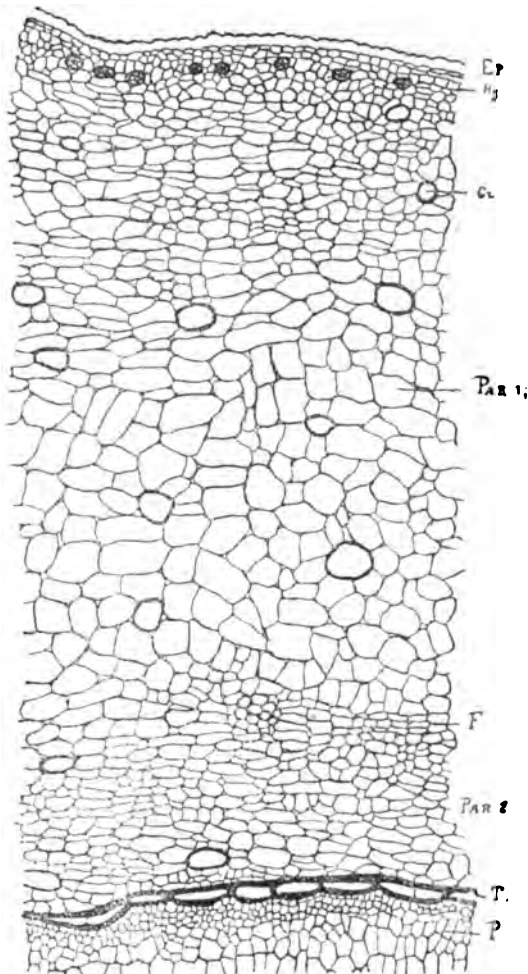


Fig. 6.—*Pothomorphe mollissimum*.

have not a burning taste. They are characterised by a layer of small cells under the epidermis, like those of the epidermis, by a hypodermal layer of three or four rows of polygonal, uniform stone cells, and by the cubical cells of the endocarp being outnised in horse-shoe fashion, i.e., the outside wall is thinner than the other three. In black pepper the reverse is

the case (Brunotte, 'Contributions a l'étude des Poivres et cubebs,' 1889, pl. 1, No. 8).

8. *Piper mollissimum*, Bl.—This fruit is known as Kebos cubebs; it is the *P. crassipes* described by Brunotte, according to Dr. De Wevre. The identification of the museum specimens belonging to the Society was made by Dr. Treub, at Mr. Holmes' request. The fruits are identical with specimens in the Kew Herbarium. The following description of them is given by Dr. De Wevre:—

The fruits are much larger than those of the official cubebs, blackish or greyish-black in colour, the surface is very wrinkled, the pedicel is about twice as long as the fruit, and is generally enlarged at the free end. The fruit is about 7 mm. in diameter, and the pedicel 16 mm. It has a very strong odour, different from that of the true cubeb, and an acrid, slightly bitter and pungent taste, but does not leave the persistent burning sensation in the mouth which is occasioned by the genuine drug.

There is a hypodermic ring of stone cells which are polygonal in form, and are larger than those of cubebs, and have a large cavity and few canals (Fig. 6).

The endocarp does not appear to be developed. There is a layer of compressed parenchymatous cells, and there is a zone in the position usually occupied by the endocarp, and formed of several rows of very compressed polyhedric yellowish cells. The stem of the plant resembles that of *P. ribesoides* in having the structure of *Artanthe* rather than of *Piper*, and judging from the histological characters of the whole plant, Dr. De Wevre thinks that Miquel was right in placing it in the genus *Pothomorphe*, rather than *Piper*.

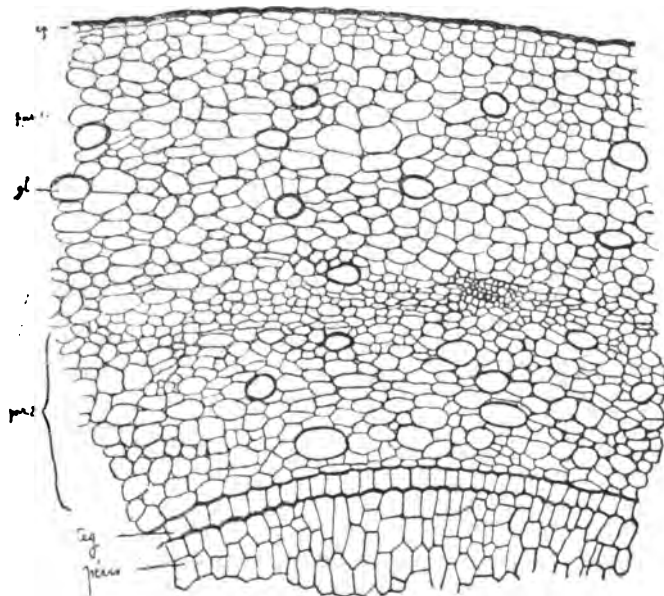


Fig. 7.—Fruit of *P. clusii*, transverse section.

9. *Piper clusii*, De C.—This fruit was found by M. Brunotte mixed with the official drug. It is sometimes imported from West Africa as a substitute for pepper.

The structure of the fruit differs from that of cubebs in several particulars (Fig. 7). There are no stone cells in the hypodermal layer, nor in the endocarp. The seed coat is formed of two layers of cells (represented by one only in the drawing, through an error). The pedicels are similar in structure to those of cubebs. Sulphuric acid gives a carmine red coloration with an alcoholic extract of the fruit. The fruit has a hot, biting taste, like that of pepper. It is about 4.5-5.5 mm. in diameter, and the pedicel is 5-6 mm., and often a little curved.



Fig. 7a.—Median vein of leaf of *P. clusii*, transverse section.

10. *Piper lowong*, Bl.—The specimen examined by Dr. De Wevre was one from Miquel's collection in the Kew Herbarium.

The fruit is very like that of *Piper clusii*, but is a little larger; the pedicel is about 5-6 mm., and is thicker and flatter than in *P. clusii*. It has but little



Fig. 8.—Median vein of leaf of *P. lowong*, transverse section.

taste. With strong sulphuric acid the crushed fruit gives a brown colour tinged with rose.

10. *Piper caninum*, A. Dietr.—More than one species seems to occur in herbaria under this name. The fruit examined was one from a specimen of the plant collected by Riedel, in Celebes, and now in the Kew Herbarium. The fruits are small, globular, distinctly mucronate, 5 mm. in diameter according to Miquel, and are furnished with a pedicel of about the same length. They do not much resemble cubebs in appearance. The structure is like that of *Piper clusii*, but the epidermal cells are larger and the cuticle is thicker.

A specimen of a *Piper* in the Hanbury Herbarium, labelled "Sirie and-jieng" (*Piper caninum* [?]), shows a very different structure, and is, Dr. De Wevre believes, identical with the cubeb figured by M. Brunotte, l.c. pl. 1, Fig. 8, with short pedicels (*supra* No. 7). A specimen forwarded by Dr. Treub to the Museum

of the Pharmaceutical Society, and labelled "*P. caninum*," appears to be identical with that of the Hanbury Herbarium. The section of the midrib of the leaf of Dr. Treub's plant is given.

(To be continued.)

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MARCH 2, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

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THE BRITISH PHARMACOPEIA.

It is difficult to determine exactly what can be the ulterior motive of the conductors of the *British Medical Journal* in publishing the series of articles on the approaching revision of the British Pharmacopœia; for the matter that has so far been published is mainly irrelevant, and the writers seem painfully ignorant of what is required of them. The introductory article, by Dr. LAUDER BRUNTON, has been reprinted, and already commented on in the Journal. In the second, Professor LEECH devotes a considerable amount of space to an exposition of the self-evident facts that national pharmacopœias are numerous and differ considerably. The logical conclusion, which, however, he fails to indicate, is that official standards for medicines vary with medical practice, and that local imperfections in the latter are reflected in each national medicine book.

The chemistry of the Pharmacopœia serves Professor DUNSTAN as a text in the third article, but it is discouraging, to say the least, to find that his strongest criticism is based on the fact that information definitely ascertained within the last three or four years only is not embodied in a work published ten years ago. Most of the suggestions made have already been included by Professor ATTFIELD in his annual reports to the General Medical Council, and it may be taken for granted that all available definite chemical information will be given, as a matter of course, in the new edition of the Pharmacopœia. However, there is no harm done in continuing to emphasise the necessity for such generally called for improvements, but it must be pointed out that what is suggested of value has already been noted, and that what has been allowed to remain in obscurity probably

deserves to remain so. The suggestion, for example, that the Pharmacopœia should be converted into a students' text-book is no whit less absurd than that it should become a therapeutic manual. Mr. DAVID HOWARD, in the fourth article of the series, deals with the official manufacturing processes, but here again we find only a re-statement of what has long been well-known and is bound to be acted upon, when the opportunity offers.

Surely, it is but a cheap and second-rate reputation that can be obtained by this system of suggestion. It has not even the little value attaching to the re-discovery of facts so frequent nowadays, and is particularly undignified in individuals occupying prominent positions. The Pharmacopœia Committee and its official reporter may not be infallible in their methods and results, but they certainly appear more likely to turn out a practical Pharmacopœia than the small host of their distinguished critics. It is not too much to say that the latter have not the least idea, beyond what is common knowledge, of what is required in a modern Pharmacopœia, and all on whom the B.P. is binding as an authority will probably find that even a continuance of the old arrangement in its entirety is infinitely to be preferred to the product of a hybrid commission composed exclusively of amateurs, even though they be professional chemists or botanists, or medical practitioners who may be more or less ignorant of pharmacy. Even Dr. STOCKMAN, in his otherwise sound and practical remarks at Edinburgh last week, endorsed Dr. LAUDER BRUNTON's criticism with respect to cataplasma conii, apparently not recognising that the evaporation of the hemlock juice is necessary to drive off the alcohol, which, if left, might have an irritant effect. The whole tendency of the excellent discussion at the Edinburgh evening meeting is but to further confirm the opinion that pharmacists should be prominent in the compilation of all pharmacopœias. Dr. INGLIS CLARK spoke of the need for aid from pharmacists to make the Pharmacopœia meet the requirements of medical men, and wisely insisted that a more direct recognition should be accorded the former. Pharmacists ought to be able to feel that, in assisting in the compilation and correction of the Pharmacopœia, they are exercising an undoubted right and not merely working on sufferance. It may be added, also, that preference should be given to "working" pharmacists rather than to ornamental members of committees, and that their position, like their work, should be second to none.

A HISTORY OF ORGANIC CHEMISTRY.

If pharmacy in the past has been the handmaid of medicine, it has equally been the nurse of scientific chemistry, and however much it may be customary in these later days for a certain class o

professional chemists to sneer at "pharmaceutical" chemistry, the fact cannot be overlooked that some of the leading chemists of their time have practised pharmacy during a portion of their career, and that the experience thus gained has probably invariably exercised a beneficial influence on their subsequent work. Amongst such eminent chemists must be classed CARL SCHORLEMMER, who, after receiving his early education at the *Volkschule* and *Realschule* of his native town of Darmstadt, obtained a good grounding in mathematics and natural science at the Darmstadt *Gewerbeschule*, and, at the age of eighteen, became pupil to an apotheker at Gross-Umstadt. His connection with pharmacy continued for seven years, but he then came under the influence of BUNSEN at Heidelberg, and decided to follow the example of his school-fellow, DITTMAR, who had abandoned pharmacy for chemistry. SCHORLEMMER, therefore, attended KOPP's lectures at Giessen, where he also received systematic instruction in practical chemistry under WILL, and in 1859 he became private assistant to Professor ROSCOE, at Owens College, Manchester. Later he succeeded DITTMAR as official assistant in the College Laboratory, and in 1874 he was appointed to a separate chair of organic chemistry, which he occupied until his death. Possessing a decided taste for the historical side of chemistry, he commenced a history of the whole science, but this remained uncompleted at his death. So early as 1879, however, he had published a work on the 'Rise and Development of Organic Chemistry' (MACMILLAN and Co.), and this, after being long out of print, has recently been revised and republished in English, under the editorship of Professor SMITHELLS, who prefaces the book with an interesting and appreciative biographical notice, and thus renders it a peculiarly appropriate memorial to its author.

It has become so much a matter of habit to associate organic chemistry with the present century that it is quite necessary that SCHORLEMMER should commence by reminding his readers that facts of universal importance for chemistry were first observed in the case of organic bodies. Thus, vinegar was the only acid known to the ancients, and its name and the conception of acidity were expressed by the closely-related words—*ὄξος*, *acetus*, vinegar, and *ὄξύς*, *acidus*, sour. Again, the first salts were prepared by acting on alkalis with vinegar, whilst the first reagent on record is infusion of nut-galls, paper steeped in which was employed, according to PLINY, to detect the presence of green vitriol (*atramentum sutorium*) in verdigris. Distillation, fermentation, and dyeing were all at first practised with organic substances, and numerous oils, fats, gums, resins, and other organic bodies were well known to the ancients. The rise and development of alchemy,

however, resulted in greater progress being made in the study of inorganic substances, although the discovery of improved methods of distillation led to the discovery of essential oils and of alcohol. A few of the medical chemists of the sixteenth century endeavoured to extract from organic bodies their active medicinal principles, a large number of essential oils being thus discovered, whilst pyroligneous acid, *acetum lignorum*, was obtained by the dry distillation of wood, impure pyruvic acid (*spiritus tartari*) from tartar, impure acetone (*spiritus ardens e saturno*) from sugar of lead, succinic acid (*flos or sal succini*) from amber, benzoic acid (*flores benzoïn*) from benzoin, and, by the action of acids on spirit of wine, ether (*oleum vitrioli dulce*) and solution of ethyl chloride (*spiritus salis dulcis*) were prepared. During the seventeen and eighteen centuries, ROBERT BOYLE, NICOLAS LEMERY, STAHL, SCHEELE, and others added considerably to the number of organic substances that had been scientifically investigated, the last-named being especially distinguished by his work on organic acids, glycerin, etc. BERGMAN, LAVOISIER, BERZELIUS, GAY-LUSSAC, GMELIN, and DUMAS followed with differing views regarding classification, and in 1828 WÖHLER performed the first synthesis of an organic compound, preparing urea from ammonium cyanate.

The historical account of the work since performed naturally occupies the major portion of the interesting volume under consideration. The inception, development, and progress or decay of the various theories that have been proposed from time to time are dealt with at length, the methods of organic analysis, calculation of formulæ, etc., etc., receive proper attention; and the last three chapters record the synthesis of different organic compounds, whilst problems yet to be solved in the same direction are specified. These include the synthesis of morphine, quinine, sugar, gum, starch, and kindred bodies. No albuminous compound has yet been synthesised, and it is pointed out that this is essential for the solution of the enigma of life, and KEKULÉ's idea is thus expressed:—"If ever chemists should succeed in obtaining albuminous bodies artificially, it will be in the state of living protoplasm." Finally it is shown that, in spite of the grand development of chemistry, probably even for that reason a survey becomes easier from day to day, and substances which cannot be arranged systematically will grow less in number in the course of time, as their constitution becomes known or as they become in some way connected with well-defined groups. Throughout the book the interest of the reader is consistently maintained, and individuals who have from any cause whatever conceived an aversion to the study of the chemistry of the hydrocarbons and their derivatives, would do well to make a special point of carefully perusing this volume, compiled by one who was not the least of the noble array of pharmacist-chemists.

THE LIQUEFACTION OF GASES.

PROFESSOR OLSZEWSKI'S claims to priority in respect to this work are now being championed by Mr. M. M. PATTISON MUIR, who attacked Professor DEWAR in the columns of *Nature*, and was replied to by the Fullerian Professor in the same place. Last week, however, he returned to the charge, and concluded a long letter by asking for an instant and serious consideration of the whole matter brought forward, "by those who are truly interested in the advance of science."

COMMERCIAL SCIENCE.

THE *British Medical Journal* of last week presents a timely remonstrance against the growing tendency to prostitute progress in medical science to personal gain. It is pointed out that from time immemorial it has been the honourable tradition in this country "that every discovery made by a medical man, tending to the relief of suffering or the preservation of health, should be freely communicated to the world and placed at the disposal of the entire profession." Dr. HANS ARONSON, of Charlottenburg, however, has recently made application for Letters Patent in this country for a method of separating antitoxins from serum by means of metallic hydrates. This, it is urged, is both unprofessional and contrary to public policy, and the Government is asked to consider whether protection in such a case would be justifiable.

A UNIVERSAL LANGUAGE.

MEDICAL practitioners continue to worry themselves about this "fad"; only a certain proportion of those who advocate a universal language for the profession recognising the fact that they are already assumed to possess a knowledge of a language which is practically universal. But the knowledge of Latin is more frequently theoretical than practical, and there seems to be a disinclination to master its intricacies. It may be suggested that English is well on the way to becoming the universal language, and that those who now practise it might do well to obtain a thorough knowledge of it. The result would be much more profitable on the whole than an imperfect acquaintance with several ancient and modern tongues.

BENEVOLENT AND ORPHAN FUNDS.

We are asked to publish the following corrections in the lists of contributions to the above funds:—*Benevolent Fund*: H. HOPKINSON, Grantham (left out), 5s.; T. L. WILLIAMS, published under Newcastle-on-Tyne, should be Newcastle, Staffs. *Orphan Fund*: GEORGE COOPER, Branscombe, £10 10s.

THE ANNUAL DINNER.

A meeting will be held at 17, Bloomsbury Square on Wednesday next, March 13, at 11.30 a.m. precisely, for the purpose of making preliminary arrangements for the annual dinner of the members of the Pharmaceutical Society and their friends. The President will take the chair, and gentlemen interested in the annual gathering are invited to attend.

Proceedings of Societies in London.**CHEMICAL SOCIETY.**

A meeting was held on Thursday, February 21, 1896, the President (Dr. Armstrong, F.R.S.) in the chair. The President read the names of the new officers for the ensuing year as proposed by the Council: as President, A. Vernon Harcourt, F.R.S., in place of Dr. Armstrong; as Vice-Presidents, Professor Japp, F.R.S., and Professor Roberts-Austen, F.R.S.; as members of the Council, in place of the retiring members, Professor Beeson, Messrs. B. H. Brough and O. Hehner. Professor MacLeod, F.R.S., Messrs. Bevan, Voelcker, and Blount, were elected auditors.

The following papers were read:—

THE ELECTRO-MOTIVE FORCE OF AN IODINE CELL.

BY A. P. LAURIE, M.A.

The object of this investigation was to discover if any relation existed between the E.M.F. and the amount of iodine present in solution, and, if so, if this fact could be utilised for determining the co-efficient of diffusion of iodine into such a solution. No reliable results could be obtained when platinum wires were used in contact with a solution of potassium iodide, as the E.M.F. varied, and no concordant results could be obtained under apparently similar conditions. When a trace of iodine, however, was added to the solution, concordant results were obtained.

It was found that for solutions of iodine, of strengths from 1 in 1,000 to 1 in 10,000, the E.M.F. varied according to the strength of solution.

A cell was now used consisting of a platinum wire sealed in a tube containing iodine solution, which diffused into potassium iodide solution, in which the zinc plate was immersed. By measuring the E.M.F. between the zinc and platinum poles at different periods, and plotting the results as a curve, the co-efficient of diffusion may be calculated.

The chemical action in the cell consists in the solution of the zinc and formation of zinc iodide; the iodine is set free at the platinum pole, and the zinc dissolved in the excess of iodine.

These experiments are only preliminary, but the author hopes to utilise the method for determining the co-efficients of diffusion of other substances.

CONTRIBUTIONS TO THE CHEMISTRY OF CELLULOSE.

BY MESSRS. CROSS, BEVAN, AND BEADLE.

Cellulose is a very inert substance towards most chemical reagents, and in many of these changes can be recovered by regeneration as cellulose, showing that no alteration has taken place in the molecule, *e.g.*, that it has not suffered hydrolysis.

By certain synthetical reactions, however, some insight has been gained as to the constitution of cellulose. From the formation of certain esters, as nitrate, acetate, etc., it was supposed that it contained three hydroxyl groups, since it yielded tri-nitrates, etc. In order to investigate the action of acetylating agents on cellulose, the pure substance was first treated with zinc acetate, when a dry powder was obtained. This

reacted with acetyl chloride, and yielded a tetracetate of cellulose, $C_6H_4O(OC-CH_3)_4$. This tetracetate was a true cellulose derivative, since it could be made into a film, and on saponification with potash it yields a pure continuous cellulose. The nitrate has also the characteristics of continuous cellulose, and may be spun into fibres.

From certain reactions, it may be assumed that cellulose acts as a salt, in various dyeing operations, and forming probably a double salt with zinc acetate as mentioned above. Now if pure cellulose moistened with pure water be placed between two poles of a battery and a current passed, there is a passage of metal from pole to pole, and this metal remains in the substance of the cellulose. In this way silver and copper have been deposited in sheets of cellulose.

It is proposed to classify the celluloses under three headings, according to the percentage of contained carbon, the furfural yield, and their reactions.

	Percentage of carbon.	Furfural yield.	Reactions.
Cotton group...	44 p.c....	2 p.c....	nil.
Jute group.....	43 p.c....	4-6 p.c....	Acts as though the (CO) group were present. Reacts with aniline, etc., as if containing a free CO group.
Cereals	42 p.c. or less	12-14 p.c.	

The cereal celluloses are probably not true pentosans but probably complex hexoses. By germination of certain seeds in nitric acid of different strengths it was found that the furfural yield increased according as the strength of the acid increased in which germination occurred. By taking cereals grown as starvation or full crop, and analysing them, the furfural yield in each case was found to be the same.

MELTING POINTS OF MIXTURES.

BY HOLLAND CROMPTON, M.A., AND MISS WHITELEY.

In this investigation the author examined the melting points of mixtures in order, if possible, to apply the laws of solution. When solidification occurs, one of the substances solidifies, leaving the other in the liquid condition.

The following formula should hold

$$\log s = \rho \cdot \frac{T - T_1}{2 \cdot T T_1}$$

where s = number of molecules of substance in 100 molecules of solvent, ρ = latent heat of fusion, T and T_1 are temperatures (in absolute units) of fusion of substance and solvent. Now for a compound the author has previously shown that

$\rho = 1.38 \nu T$ where ν is the valency of elements in the compound.

It was found that the melting points did follow this formula, though they generally obtained results too high from those calculated. This they attribute to the fact that the substance separating out as solid is not pure but contains a trace of the solvent.

THE VOLUMETRIC DETERMINATION OF MANGANESE.

BY J. REDDOP AND H. RAMAGE.

The method generally followed for the volumetric determination of manganese is to dissolve the ore in nitric

acid, and add peroxide of bismuth, when the manganese is oxidised to permanganic acid, and then titrate with hydrogen peroxide. An improvement in this method is as follows: the ore is dissolved in dilute nitric acid and sodium bismuthate added, and the whole run into a known amount of hydrogen peroxide, which is then titrated back with standard potassium permanganate.

In this way very rapid and accurate results are obtained, sodium bismuthate $NaBiO_3$, acting as a very powerful reducing agent.

The following papers were taken as read:—

"Bromocamphoric Acid, an Oxidation Product of Bromocamphor," by Dr. Kipping.

"Note on the Action of Diastase on Cold Starch Paste," by H. Brown, F.R.S., and Dr. G. H. Morria.

"Magnetic Rotation of Some Olefines," by Dr. W. H. Perkin, F.R.S.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, February 21, the following paper was read:—

DIATOMS.

BY F. RANSOM.

The subject which I propose to bring before your notice is, I fear, but remotely connected with the theory or practice of pharmacy. The interests of the educated pharmacist are not, however, confined to the matters which immediately concern his profession; many members of our calling find the pursuit of some branch of natural history an attractive form of recreation.

Of the various departments of botany there are probably few which provide more interest for the collector and for the student in botanical physiology than the study of diatoms. The number of recorded species is constantly increasing, there are points connected with their life history of exceptional interest, and they provide some of the most beautiful objects which are to be found in the microscopist's cabinet.

The main characteristic of a diatom, which at once distinguishes it from all allied unicellular organisms, is the presence of a hard framework of silica which appears to be intimately associated with the cellulose of the cell-wall. This shell is all that is usually seen in mounted specimens, the organic constituents having been previously removed by means of acids or other solvents. The contents thus removed as interfering with the delineation of the delicate markings of the shell, correspond to a large extent with those usually found in a young vegetable cell. The entire cell, or frustule as it is termed, is surrounded by a thin gelatinous envelope, which is invisible until stained with some reagent.

Diatoms, in considerable variety, being everywhere abundant, offer to all who are interested in the study of the minute forms of life, exceptional opportunities for observation. In every sea or river, pond or ditch, in fact, in almost every place where water has remained for a few days exposed to light and air, di-

atoms are to be found in greater or less abundance. Even amongst moss and on the surface of damp ground they may frequently be discovered. If some of the brown deposit which is often seen attached to any smooth surface washed by running water be carefully removed and placed under a microscope, it will be found to contain large numbers of these minute organisms, if, indeed, it be not entirely composed of them. They can generally be detected amongst other bodies present by their symmetry of form and the more or less evident markings on their siliceous shells.

Although comparatively recently discovered, probably few families of the vegetable kingdom have had a more eventful history as recorded by their different observers. Their minute size, together with the imperfections of the instruments used in their examination, and the very uncertain and often erroneous biological ideas held by their early observers, concealed for a long time their true position in nature. According to Ehrenberg, the great German naturalist of the beginning of the present century, diatoms were discovered early in the eighteenth century, and the first undoubted illustration occurs in the 'Philosophical Transactions of the Royal Society' for 1703.

In 1745 William Arderon described what he terms the "oat-like animal," evidently some species of *Navicula*, a genus of diatoms, associated with the "hair-like insect," as he designates the *Oscillaria*. The most evident reason for thus placing in the animal kingdom the representatives of these two families, which are now regarded as undoubted plants, was the power that both possess of individual movement, apparently quite independent of any exterior agency. A more extended knowledge of plants has clearly demonstrated that motion of this description is not confined to animals, but is frequent amongst the lower forms of vegetable life.

At the beginning of this century much confusion existed, and the *Naviculae* were regarded as one stage in the life of the *Oscillariae*. Shortly afterwards a remarkably bold observer (Ingenhousz) maintained that in certain forms, at least, their characteristics were not sufficiently defined to warrant their being placed either amongst animals or plants, and he considered that their true position was in the mineral kingdom. Such degradation, however, was not long maintained, for in 1816 we find a distinction being made, some species being regarded as animals and others as plants. De Candolle and some other observers correctly regarded the whole family as plants. About the year 1822 Bory de St. Vincent, being unable to satisfy himself in placing several of the lowest forms of life amongst animals or plants, created a sort of intermediate organic kingdom, which he called *Arthrodiées*, in which many diatoms were included. In 1831, Ehrenberg remarks that he had succeeded in establishing their place in the animal kingdom, and they are thus classed in his valuable work on the *Infusoria*. Here they appear to have remained undisturbed for some time, but gradually as general biological knowledge advanced, and as observers had more efficient microscopes at their disposal, doubt began to arise, until in 1853 the Rev. William Smith in his standard

work 'A Synopsis of the British Diatomaceae' unhesitatingly classifies the whole family as a natural order in the sub-class *Algae* of the vegetable kingdom. Quite recently an attempt has been made by Cunningham, an American observer, to prove that diatoms possess the characters of Protozoa, and should consequently be classed as animals. He relies largely on observations connected with their movements, which, he considers, show some indication of volition. These observations, or at least the deductions from them, are not likely to be confirmed, and there is little doubt that they will be allowed to remain in the comprehensive group of *Algae*. The desmids have frequently been classed with diatoms, but the absence of the siliceous shell and other important differences have now caused them to be placed in a separate order. Thus we find that during their comparatively short existence in the domain of science, diatoms have been allotted to each of the three kingdoms, and have also for a short time been placed in a fourth, which was brought into existence largely for their accommodation.

Having briefly reviewed the history of the Diatomaceae, it will be well to enter more fully into their structure. Each cell is either free, attached to one or more of its species, fixed by a stipe to some foreign body, or enclosed with many others in a long gelatinous tube. Each frustule is seen to possess two valves, placed together in a position somewhat similar to a closed bivalve shell, but instead of being closely attached they are connected by two siliceous hoops, one fitting closely into the other. Within the frustule is found a yellowish-brown, or occasionally green, colouring matter or endochrome, which is similar to the chlorophyll of most plants, and evidently capable of performing the same functions. Diatomine was the term employed by Nägeli to indicate this colouring matter, which he wrongly considered to be a simple compound. It appears to consist of true chlorophyll associated with certain yellow coloured principles, which are not usually present in green plants. The colour of the so-called diatomine is readily changed to an emerald green by the application of heat, alcohol, or acids. On adding chloroform to a dilute alcoholic solution, Petit found that on separation the whole of the yellow colouring matter was left in the hydro-alcoholic solution, while the chloroform was coloured green by a substance which produced the absorption spectra characteristic of chlorophyll, and with which it was probably identical. Some extraordinary instances have been given of the apparent power of this endochrome to resist decomposition. Brun relates that some diatoms which he had collected in the Sahara, and kept in the water in which they were found, preserved their endochrome in an unchanged condition for four years. The same authority also states that he had seen fossil diatoms from a large deposit in Holland, and which must have been buried for centuries, present occasional specimens in which the endochrome was still yellow, although it had become somewhat thicker and more plastic.

The protoplasm which is present in the frustule remains invisible until coloured with some special re-

agent. It is then seen attached to the shell, occupying a position similar to that of the primordial utricle in most vitally active cells, and extending in the form of channels to the centre, where the nucleus and nucleoli may be distinguished. Unlike the great majority of plants, diatoms are believed to contain no starch. It is possible that traces may be discovered, but if present the quantity must be exceedingly small. There are also usually present minute oily globules which are found in various parts of the frustule. It has been suggested that these globules take the place of the starch grains frequently met with in confervoid Algae. On drying and heating, a peculiar odour is emitted which has been ascribed to this oily constituent. The remainder of the interior is occupied by water, a current of which is continually passing through the frustule. The water is charged with carbonic acid, which is decomposed in the process of assimilation, the carbon being retained and the oxygen liberated. This oxygen, being less soluble than the carbonic acid, may frequently be seen rising in bubbles to the surface of the water wherever there is any large aggregation of diatoms below. This power of liberating oxygen affords one of the strongest reasons for placing the order in the vegetable kingdom. Various compounds dissolved in the water are also retained for use, including silica that is required for the construction of the valves, and nitrogen compounds for the formation of protoplasm.

(To be continued.)

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The fifth meeting of the seventeenth session was held in the Pharmaceutical Society's Hall, 36, York Place, Edinburgh, on Wednesday, February 20, at 9.15 p.m., Mr. Alexander Sutherland, President, in the chair.

The minutes of last meeting were read and approved.

The Chairman said he would take this opportunity—the first time the Association had met in the new Hall—to express on behalf of the Association the generous way in which the Council of the Society had always treated the Association, and the kindness of the North British Branch Executive in making such arrangements for their comfort and convenience in holding their fortnightly meetings.

The following paper was then read:—

THE PROFESSION OF PHARMACY FROM AN APPRENTICE'S STANDPOINT: BEING SELECTIONS FROM THE DIARY OF AN APPRENTICE.

BY W. MAKEPEACE LOOK.

Though this title be somewhat long, and may appear somewhat bombastic, yet, after mature consideration, I came to the conclusion that the subject in all its grandeur required these few words to express exactly what is implied. I am aware that the usual run of apprentice communications to this Society partake more of the nature of reading something which may or may not be pharmaceutically of interest to its

members. But, be it understood, it is for this very reason that I introduce the present effort, as a kind of general "pick-me-up," a revivifying draught, after the night or two of chemical and pharmaceutical notes to which this Association has had the pleasure of listening. And, be it understood, also, that I treat it in the lightest possible spirit, for, although I have had this diary in my hands for some little time with intent to make use of it, I have not been favoured with an opportunity to present it to you.

Now that the opportunity has come, I feel astonished at my temerity in producing it, but, needless to say, I rely wholly on the indulgence of those now before me. The story is told by the author, in my words, however, and when the pronoun "I" is used, I expect you to understand that the author is meant, and not your humble servant. Having executed this preliminary canter to your satisfaction I hope, let me now proceed to the more serious business.

"I," says he, "having received a first-class education, in the scope of which figured Greek, Latin, Geometry, Trigonometry, and various other accomplishments, was duly apprenticed to a chemist and druggist, and having got through my first morning's dusting, which I relished not, was told off to wash a few gross of greasy, filthy, evil-smelling bottles, and to hold myself in readiness at a moment's notice to convey certain mysterious packages and some few syphons of aerated waters to customers of the establishment. Pegging away manfully at my bottles, I washed a dozen or two with but indifferent success, and was anything but relieved to hear my new master's voice, saying in tones certainly neither sweet nor pleasant, but varying in modulation, like the strains of a penny tin whistle, 'Bring half-a-dozen syphons of soda, Cornelius (for my name is Cornelius), and be quick about it. Mind, now, make no mistake, but carry them smartly to Mrs. Collodion Flexile, just round the corner. And now be off.' I, therefore, never having before converted myself into a hewer of wood or a carrier of waters, very naturally visited my just indignation on the message boy, whose bounden duty the fulfilment of those offices I rightly believed to be. However, screwing up my courage to the desired point, and hoping against hope that Mrs. F. did not live far away, I bravely snatched up the syphons, departed on my *bête noir*, but found from the numbers on the doors that 'my lady' lived at the extreme end of the terrace. Here was I, then, with a syphon in each coat pocket and two in each hand—a kind of 'light porter, in fact—trudging along to Mrs. Collodion Flexile, who lived fully three-quarters of a mile away. Alas! fickle fortune, who did I see but my God-mother, Lady Turmeric, driving past in her carriage. I tried, oh! how I tried to escape observation, but was detected in the very act. True to my gentlemanly instincts and up-bringing, and manipulating the syphons as best I could, I deftly uncovered my head, when crash! crash!! crash!!! bang! went three syphons on the pavement, while I, the indentured apprentice, or rather the articulated water-carrier, stood thunder-struck, gazing on my handiwork. Then, crushing back a sob, I resumed my journey, delivered the full syphons,

received empties, and walked back to the shop, brooding over my sorrows. My master, who, to tell the truth, acted very much like a raving maniac, said it was perfect nonsense and downright carelessness, but what vexed me most was being called a liar, for he said that my story was a mere fabrication of trumped-up falsehoods. Of course, he knew best, being older than I, and consequently having more experience in the ways of the world. I did not chronicle any more that day.

"Such small escapades as these served to make the first months of my apprenticeship very dull indeed, and sure it was no wonder, for, on account of the many hard words which were slung at me from time to time, with more or less coarseness, nearly all that essence of vitality and that exuberance of spirit, both of which are so essential to youth, were slowly, steadily, and surely being crushed out of me. However, and in all justice to my superiors do I say it, I managed to pick up a knowledge of those little details which fell to my lot during my first year's apprenticeship, such as putting up powders, learning to weigh substances and measure liquids accurately, making pills, ointments, and suppositories, all with tolerable speed and correctness. Also, I might mention, again in due justice to my employer, that I learned to clean greasy ointment slabs, resinous and gummy mortars, and a multitude of other menial occupations too numerous to mention. This, then, was my work from day to day, week to week, and month to month, with the exception, however, of a weekly window-cleaning-day, in which I, though new to the mysteries of whitewash and chamois leather, was forced by circumstances to share.

"While I was busy with the large sheets of glass, rubbing them to the best of my ability, the questions, 'Is this pharmacy?' 'Is this the work of an apprentice chemist?' kept constantly recurring to my mind.

"The ultimate conclusion at which I arrived was this, that the chemist's profession like croton-chloralhydrate is 'wrongly so-called.' Not being able to polish the immense panes to my master's satisfaction, at which you can scarcely be surprised, he launched at me a long and exhaustive torrent of invective and abuse; indeed, to put it plainly, he called me a fool. The proverbial boot-jack would even have been preferable to this, for I might have dodged it, but what caused me most pain and gave me a very sore and almost bursting heart was the fact that the assistant, who, up to this time had looked upon me with a feeling akin to contempt, took advantage of our master's temporary absence to discourse freely with me about what he called my 'thinking too much of myself.' Thinking too much of myself, indeed! Well, well, it is hard that one should be misunderstood! He, when an apprentice, had gone messages, wheeled hand-carts, cleaned windows and washed bottles, but he did not for one moment consider the difference in our social position, and that it was infinitely more humiliating to me than to him. All these aforesaid items he enumerated with a very evident relish, well knowing that by this means he would cut me deep, yea, even unto the core. Whatever he had done was not too much

to ask an insignificant apprentice to perform. These were his concluding words, but to all those wounds and stings, I applied antidote of 'Golden Silence.' Thus did I pursue the even or rather uneven tenor of my way, gaining knowledge *en route*, but at the same time devoutly wishing that I never had been born. However, in justice to my employer, let me say that I could read and dispense prescriptions in a very fair way. I could also, thanks to him, make my bow and my scrape to his customers, converse freely with them on current topics, and could make myself generally useful. Four whole years had now rolled over my devoted head, during which time I had performed many odd jobs, in fact, become a jack-of-all-trades and master of none. Thanks be to him, I handled the saw and drove in nails like a carpenter; I pined the needle like a dressmaker; I repaired broken pipes and performed dirty, offensive work like a plumber; I swept the floor and lit the fire like a housemaid; I washed bottles, slabs, mortars, and various dishes like a scullion, and dusters like a washerwoman—comprising all these occupations, mark you, under the guise of an apprentice chemist. Woe worth the day, woe worth the hour, when I parted company with my self-respect. Little did I think that I, when I entered the so-called magnificent profession, should be thus cast down into the depths of despondency and despair! Oh, the natural unfitness of things. Much as it relieves my feelings to let off steam in this manner, never, oh, never, shall this diary reach mortal eyes other than mine.

"Another feature of the business of the self-styled professional gentlemen is the sale of such articles as combs—both small teeth and large—brushes, tooth brushes, nail brushes, and last, but not least, those abominable cigars. Why a person must serve an apprenticeship to sell these things is entirely beyond my comprehension. Perhaps the qualification of being a professional shopman may in some measure account for this? I do not know, though, and care still less. I am heartily sick of the whole business. A mad frenzy, both of despair and sorrow, seizes me even now as I write. As the truth is slowly forced upon me that the last year of my apprenticeship has drawn to a close, I realise that I am a done creature. All pleasure and light has died out of my life, backbitings and scornings have embittered my existence. No succour at hand, no respite near, I am dragging out in solitude the wretched remains of a thoroughly wasted life. I see before me the phial of morphine solution which shall so soon rescue me from this purgatory. I have it in my hand, I am toying with it. Alas, God help me, I have swallowed the contents. May mercy be shown me hereafter, as it never was here. I have little time to write more, but before I fall into that pleasant somnolent state due to the effects of opium, let me express one wish, that the all-familiar legend be inscribed on my tomb. . . . *Requiescat in Pace*. In life I was miserable, in death I am, if not happy, less miserable than before. Farewell!"

Thus, then, ends the diary. Let me ask your attention for a few minutes more in order to add a few remarks of my own, and to offer an explanation

as to why you have heard this gruesome tale of woe. The young fellow whose summarised life you have just heard was an intimate friend of mine, and after his decease, the causes of which were hushed up as much as possible, his immediate relatives presented me with his diary as a remembrance of him who has departed this life. The medical expert in attendance informed me that after partaking of the fatal draught, my friend was seized with drowsiness, drowsiness gave place to giddiness, giddiness to stupor, stupor to insensibility, his breathing became hard and heavy, his pupils became contracted, his pulse feeble, coma and convulsions resulted, and death ensued. Considering, therefore, the manner of his death and the primary causes of it, I, notwithstanding his intention that the diary should never reach mortal eye, have presumed to convey it to your ears, thereby violating the wishes of the dead. But for this breach of friendship I hope to receive pardon, knowing that a lesson, however weak, is not without its good results.

But let that pass. I can quite well believe that what you have just heard is in some parts a little overdrawn, but I can just as well credit a great portion with truth, and that pretty strictly. Let me venture to say, and I can almost hear my heart beating as I say it, that "it's not exactly what master says, but it's the nasty way he says it." A little more kindness, a little more forbearance, a word or two of judicious praise, and a little less of the commanding and exasperating tone would all be valuable adjuncts to ensuring a successful, conscientious, and hard-working apprenticeship. And you assistants, too, be not ever ready to abuse the little authority with which your master entrusts you. Remember that you yourselves were once apprentices, and visit not your wrath upon those under you simply because you had to stand it. No, be kind, and a model establishment will result. And you apprentices who intend to follow out the business, bear all these things in mind, and beware, for you are the next generation of assistants and masters. Conduct yourselves properly—speaking, acting, and thinking; stand on your dignity as gentlemen, and all will be well.

One word more and I am done.

Without doubt we have all—all, I say—as apprentices, been forced to perform many operations, of which window cleaning and washing bottles are but types, and if these menial occupations are to form a basis of a general standard of excellence, of what use might I ask is it necessary, necessary, bear in mind, to introduce into the scope of the Preliminary examination higher mathematics and the classic languages. As Mr. Hill very nicely put it, it would be advantageous; but would it be essential? Applying the same argument still further, it certainly would be advantageous to know how to clean bottles, but is it essential, or should it be so in the chemist's business? Again, in what position is an apprentice (an average one, I mean) when he has finished his time? He has learned the art of dispensing physicians' and surgeons' prescriptions, and that of washing bottles. Both of these are great privileges, especially the latter—at least, so we, as apprentices, are told. Why

should it be? During his apprenticeship he has had no time for study, for what youth has the fortitude to study after twelve hours' work and drudgery. How then can he pass his Minor? By taking classes, you say. Yes, perhaps so, but in some cases the wherewithal is not forthcoming. What then? No, no, before trying to raise the standard of the Preliminary, with a view to introducing a better class of apprentices into the trade, for at present it is nothing else, raise the present apprentices from the state of disgust and apathy into which their duties plunge them by purging the so-called profession of its defects. By employing the proper class of individuals for menial work, healthy and permanent good would undoubtedly result to the business.

Then, and not till then, will chemists be justified in advertising for an apprentice to follow the profession of pharmacy.

The reading of the paper was followed by a discussion, taken part in by Messrs. Cowie, Hill, Lock, Mackenzie, Sutherland, and Thwaites, the general opinion being that while the conditions of apprenticeship were too frequently highly unsatisfactory and as a rule capable of much improvement, especially in regard to time for study, many of the so-called menial duties named by the author formed an essential, though perhaps unpleasant, part of a complete training in practical pharmacy.

The next paper was a—

NOTE ON LINSEED MEAL.

BY ALEXANDER J. DEY.

The author said he had been unexpectedly prevented from completing his work, and could now offer a few preliminary observations only. He was engaged in the examination of eighteen samples of meal obtained from grocers and chemists. It was noteworthy that in most of the best class grocers' shops he was told they did not keep linseed meal, and was referred to the nearest chemist. The yield of oil from the samples varied from about 5.5 to 36 per cent. Only one sample indicated presence of starch. With one exception the chemists' samples appeared of excellent quality, but those obtained from grocers, though often yielding the full percentage of oil, were coarse and inferior. He intended to suggest characters and tests which might be introduced in the new Pharmacopœia. He hoped to finish the work and have something more definite to say at a later date.

In the discussion which followed, Mr. Cowie said many medical men preferred the old crushed cake, and he thought its use should be made legal.

Mr. Rutherford Hill then performed some so-called "Backshop Experiments," illustrating, among other things, the fact that a chemist must necessarily have a good eye for colours.

On the motion of the Chairman, votes of thanks were awarded to the authors of papers and to Mr. Hill.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on February 7, the following paper was read:—

NOTES ON THE REVISION OF THE BRITISH PHARMACOPEIA.

BY GEORGE LUNAN.

Acetanilidum.—The maximum dose should be up to 4 grains. In B.P. addenda it is 10.

Acidum Carbolicum.—The melting point should be raised to 38° C. at least, possibly 40° C. is commercially attainable. There should also be inserted under tests a quantitative determination of carbolic acid. The valuation introduced in U.S. Pharmacopœia works very well. The process consists in combining the sample with a weighed excess of bromine and titrating with volumetric sodium thio-sulphate after the solution has been treated with excess of potassium iodide. The purity of phenol is approximately determined by loss of free bromine.

The liquefied carbolic acid requires 12½ per cent. of water, not about 9, as at present, to keep permanently liquefied. The addition of spirit as suggested by Boas may meet the difficulty and retain the same strength. It would be better to have the finished product contain exactly 90 per cent. of carbolic phenol, or a definite eighth of water added. On the whole I favour the latter course.

Acidum Hypophosphorosum.—The increasing use of hypophosphorous acid warrants its inclusion in the new Pharmacopœia. The process of manufacture need not be stated, provided full tests for its purity be given. The stronger acid, containing 30 per cent. PHH_2O_3 , and having a specific gravity of 1.1367, is to be preferred. The acid should be free from sulphates, oxalates, barium, and calcium, should not respond to tests for phosphites and phosphates, and should be determined by sodium hydrate or permanganate standard solution. Failing a purer acid than the present processes produce, it will have to be obtained by decomposition of lead hypophosphite with H_2S .

Acidum Lacticum et Acidum Lacticum Dilutum.—It is, I venture to suggest, confusing to have two strengths. My experience is that it leads to confusion of prescribers, who frequently write "acid lactic" when they mean their patient to get the diluted preparation, the lactic acid of P.B. which has dose stated. Besides, the demand does not justify it occupying so much space. The acidum lacticum should remain in P.B. and have the dose attached—5 to 20 minims, the other should be deleted.

Acidum Meconicum et Liqueur Morphinæ Bimeconatis.—It is doubtful if these have justified their inclusion, As far as I have formed any opinion it is opposed to retaining them.

Acidum Salicylicum should have melting point raised to 156° C.

Amyl Nitris.—The dose "In mixtures to be swallowed" is stated at "from ½ minim to 1 minim." I have frequently dispensed it up to 2 minims, and am assured that that dose is quite safe. Is it not possible

that this may be due to prescribers having experience of old and deficient samples?

Amyl Nitras.—Dose ½ to 1 grain. I have twice dispensed prescriptions with 5 grain doses.

Armoracia Radix et Spiritus Armoracia Compositus should be omitted. There are many unofficial drugs and preparations in more frequent use, and the fact of their inclusion in 1864, 1867, and 1885 P.B.'s gives all the reference their use requires.

Esberina Sulphas should be deleted. It has appeared in the 1864, 1867, and 1885 Pharmacopœias, and it is time it was relegated to the place of an old official preparation.

Bela Fructus.—This should give way to another drug, whose properties are definite and assured.

Bismuthi Chloridum et Bismuthi Salicylas.—Both oxy-salts are likely aspirants to pharmacopœial honours. They have advantages over the official bismuth salts for certain cases, and are in frequent request. The former, an oxy-salt, as all official bismuth salts are, has the formula BiOCl , and is readily obtained by pouring solution of bismuth chloride into water. On account of this salt having been long in the market in a very impure condition as a cosmetic, "pearl white," "blanc de pearl," it will have not only to be safeguarded with all the bismuthum purificatum tests, but carefully examined when taken into stock. The maximum dose of all bismuth salts save the oxide and salicylate should be raised to at least 60 grains. I frequently dispense without question two drachm doses of subnitrate.

With regard to the oxy-salicylate of bismuth, great difficulty is experienced in preparing a pure salt.* Dott has pointed out that samples should yield on ignition 61.31 per cent. of oxide, and not more than a trace to ether (absence of free salicylic acid). The present supplies require careful examination for free salicylic acid and bismuthyl chloride (bismuth oxy-chloride) and bismuthyl nitrate. Dose, up to 30 grains.

Caffeina Citras should be *caffaina citrata*, citrated caffeine, not citrate of caffeine.

Caffeina Citrata Effervescens.—An official formula for this preparation is required. The following makes a very good preparation.

Take of—

Citrated caffeine	4 parts.
Bicarbonate of sodium	46 "
Tartaric acid.....	24 "
Citric acid	16 "
Refined sugar	10 "

100 parts.

These granules contain rather over 4 per cent. of citrated caffeine—no allowance being made for evaporation from citric acid. The sugar is necessary to give the preparation a similar taste to the unofficial preparations (containing from 1 to 5 grains in drachm) so frequently prescribed. Otherwise it is no advantage. The dose ʒi. to ʒiii. The U.S. Pharmacopœia formula contains one per cent. of

* *Pharm. Journ.*, p. 582, No. 1231.

caffeine, and the bulk is made up of equal parts of bicarbonate of sodium, tartaric acid and sugar, which, after being dried together, are granulated by moistening with alcohol, the granules dried, and reduced to a coarse granular powder.

Cannellæ Cortex should be omitted as well as *vinum rhei*, the preparation for which it is required.

Cataplasmata.—On the whole I think these might now be omitted. No doubt it is well to be able to give directions for preparing poultices of varied substances, but the Pharmacopœia need not contain more than a type, say *cataplasma lini*. This would entail the deletion of *cerevisiæ fermentum*, etc.

Charta Epispastica.—The cantharides should be doubled, otherwise the formula should be deleted.

Charta Sinapis.—Hill has stated that the direction to immerse in tepid water is not required, the heat of the body very soon setting up the fermentative action, while there is always a risk if B.P. direction be followed of destroying the ferment altogether, and rendering the mustard paper inert.

Chrysarobinum.—The definition will now read—"The medullary matter of the stem and branches purified by solvents."

Cocaina.—The alkaleid should be added to the Pharmacopœia. It is now frequently prescribed in combination with oleic acid or dissolved in soft paraffin or petroleum oil.

Decocta.—There is no doubt that the decoctions are getting into disrepute, and that their place is being taken by fluid extracts containing the active principle in definite quantity: still it is a large order to suggest their elimination. Of course the drugs are well selected for extraction by decoction, as they contain no volatile ingredients.

Elixirs.—The time has come when the editor of the Pharmacopœia should recognise this class of preparations. There is a growing demand for preparations combining palatability with potency, and the ordinary syrups are objectionable from the quantity of sugar they contain.

The following elixirs are already in frequent use, and should be added to P.B. :—

Elixir Cascara.—Published unofficial formulæ for this are numerous, and it is for those responsible for B.P. to authorise one or produce a new one.

Elixir Glusidi.—B.P.C. formula well known and preparation largely used.

Elixir Phosphori.—The B.P.C. Formulary Committee have given a very good process, but it would entail introducing a compound tincture of phosphorus. This is not necessary if directions be given to combine the two formulæ and prepare as required. Strength 1 in 50. Dose up to 2 drachms diluted with water.

Elixir Simplex.—A vehicle to cover the taste of nauseous medicines.

Emplastra et Enemata.—Regarding the former, we can discuss whether something should be done to introduce the rubber basis, and, regarding the latter, whether many or all the formulæ should be deleted.

Essentia Camphoræ, Eucalyptol and *Exalgin* should be made official.

Extractum Grindeliæ Fluidum has now justified its inclusion, and the leaves and flowering tops of *Grindelia robusta* and *Grindelia squarrosa* should be made official.

Extractum Nucis Vomice Fluidum. The tincture might be made from this. The solid extract, even after standardising, is apt to vary, usually becoming stronger in total alkaloids from loss by evaporation. A standardised fluid extract would always give a definite tincture. I express no decided opinion on the subject, but I think it worthy of discussion.

Ferrum.—Under this heading I wish to bring under your notice the question of the comparative utility of permanganate of potassium and bichromate of potassium volumetric solutions as means for the determination of ferrous salts. The U.S. Pharmacopœia has introduced the former method, and it is a question if it has any advantage over the bichromate solution. During the last few days I have made and worked the U.S. solution for the purpose. On the face of it there would appear the advantage of the termination of the reaction becoming apparent in the solution, but to neutralise this there is the very clear definition which ferridcyanide of iron gives with the bichromate solution, and the fact that the latter standard solution keeps better than the permanganate. So that there are advantages and disadvantages, and perhaps it is just as well to work the solution we are accustomed to.

Ferri Subchloridum, better known as protochloride, should be added. It is largely used, but most unstable, and consequently requires official tests to protect it.

Ferri Sulphas Exsiccatus.—Commercial samples vary as much to-day as they did five years ago, when I examined this salt. Perhaps 90 per cent. of $\text{FeSO}_4 \cdot \text{H}_2\text{O}$ would be obtainable instead of 97½. The U.S. Pharmacopœia does not include it. The dose should be up to 5 grains.

Glycerinum Glyceryli Boratis (Glycerin of Glyceryl Borate).—I agree with Mr. Dunlop that it would be well if all the glycerin preparations were of uniform strength, and with his remark concerning glycerinum boracis. The preparation mentioned above and the inclusion of which I have already advocated will not conform to this standard. The U.S. formula, which is familiar to us, consists in preparing glyceryl borate by eliminating water from glycerin and boric acid and dissolving the resulting glyceryl borate in glycerin. It contains 50 per cent. of glyceryl borate, 31 per cent. of combined boric acid, and is more prescribed at present in my experience than any of the official glycerins.

Liquor Ammonii Acetatis et Liquor Ammonii Acetatis Fortior.—As you are aware, the carbonate is used for preparing the solution because the free carbonic acid which the liquid retains makes it more easily borne by the stomach. The taste and smell are better also than when prepared from hydrate. The insertion of the formula for a stronger solution minimises this advantage, for by the time it is diluted and used most of the carbonic acid is expelled. The point is, then, whether it would not be better to delete the latter altogether and return to the 1867 formula. If

a stronger solution is desired it can be made by mixing equal parts of stronger solution of ammonia and glacial acetic acid. This will be eight times the strength (over 50 per cent. ammonium acetate) of the ordinary solution.

Liquor Magnesii Carbonatis.—In one of his reports Dr. Attfield has sanctioned the reduction of the strength of this preparation, its volumetric determination (instead of gravimetric), and storage in small bottles. I have now to add to what I have already written regarding this preparation, that I agree with Symons' suggestion (it was suggested by Coull at the meeting at which I read the note) that the estimation should be made with volumetric sulphuric instead of oxalic acid. No, doubt the former acid has advantages over oxalic, more especially for expelling carbonic acid from carbonates and bicarbonates, but the oxalic solution might be retained for the hydrates and substituted for the ferrous sulphate determination of permanganate of potassium. It is held in some quarters that rather than lower the standard liquor, magnesii carbonatis should be deleted, but I think the demand is increasing, and the official stamp protects the preparation.

Liquor Potassæ Effervesens et Liquor Sodæ Effervesens.—I shall adhere to my proposition of two years ago to introduce a minimum standard for these aerated waters. The B.P. should say that aerated potash and soda water may be prepared containing not less than 5 grains to the pint.

Liquor Strychninæ Hydrochloratis.—The editor has reported that the amount of acid in the formula will be reduced according to suggestions given.

Lithii Citro-tartras Effervesens.—This is one of the introductions most urgently required in our B.P. The U.S. Pharmacopœia have adopted a formula which is in effect a lithiated saline containing 7 per cent. of carbonate of lithium and a large percentage of sugar. This would not succeed the unofficial preparations largely prescribed in this country. Usually the latter contain from 2 to 5 grains of citrate of lithium in the drachm, but I am strongly of opinion that, for the sake of economy and potency, the carbonate should be used in the granules for the immediate production of the citro-tartrate. It would be an advantage to do without the sugar, more especially as the class of patients lithium salts are prescribed for find it necessary to use as little sugar as possible. Besides, the omission of the sugar increases the effervescence, and gives a briskness not to be got from a sugared granule. I show a sample made on these lines, and could offer a formula, but that is unnecessary, because the committee will produce it if they decide to include this preparation.

Lithii Salicylas.—This salt should be added. Commercial samples vary in colour and purity, and some have a strong smell of carbolic acid. We have prepared it by the following formula whiter and better than we can buy it:—Three parts of lithium carbonate, 11 of pure salicylic acid, in 25 of water, heated and evaporated at a low temperature to dryness, then powder.

Morphinæ Tartras should be added as the best salt for the immediate production of hypodermic solutions.

Naphthol Beta should be included. The frequent call we have for it requires that we should have official tests for its purity.

Oleatum Hydrargyri.—I agree with Mr. Dunlop that a 20 per cent. oleate would be more convenient and remain homogeneous longer.

Oleum Eucalypti.—The test for the detection of phellandrene, contained in U.S. Pharmacopœia, should be added.

Pilocarpinæ Hydrochloras.—With me this is in greater use, mainly for ophthalmic purposes, than the nitrate.

Potassi Bichromas.—Now frequently prescribed in pills. Maximum dose should be stated.

Pulvis Cretæ Compositus, from which the *mistura cretæ* could be prepared at a moment, should be introduced. As a matter of practice this, I believe, is generally done.

Quininæ Salicylas, *Resorcin*, and *Salipyrine* might be added.

Tabellæ or Compressed Tablets.—Suggestions have been made that these should have a place in the Pharmacopœia. I consider that care should be taken to distinguish between methods of exhibiting drugs. In the first case you exhibit in another form what is already official, in the second you introduce a substance of different chemical properties. Now there is no end to modes of exhibiting drugs, but it lies with the dispensing chemist to cultivate and improve that department. He may advise that, say, phenazonum be given in a tablet, sulphonal in a capsule, salol in a cachet, and menthol in a glycoelatin pastille. Because someone advertised either method, and a demand is made for the drug in that form, is no reason why it should become an official mode of exhibiting it. The pharmacopœial function is to place the drugs in the hands of the dispenser, to outline processes for exhausting those that require preparation, to provide full tests for their purity, but not to multiply modes of exhibiting them.

Tinctura Benzoini Composita.—Some time ago Dr. Stockman mentioned that he thought the aloes should be omitted from this tincture. It is mainly prescribed now for inhalation, a different purpose for which "Friar's balsam" was originally used. I think the aloes should be omitted as practically useless in an inhaler. We have prepared it without aloes, and since we introduced it, find that medical men prefer it.

Tinctura Quininæ Ammoniata.—I take this opportunity to reply to the reference Professor Attfield made in his report to my formula for the preparation of this tincture with carbonate in lieu of hydrate. It is impossible to increase the quinine to 2 grains in each drachm from the greater solubility of quinine carbonate as he desired. The tincture made with the carbonate by this formula—

Sulphate of Quinine	160 grains
Carbonate of Ammonium	320 grains
Proof Spirit	20 fl. oz.

is more soluble, contains the same quantity of NH_3 and quinine, but differs in having the carbonic radical in place of the hydroxyl, and it remains for a therapist to say if it is a possible substitute.

Correspondence.

POISONOUS WEED KILLERS SOLD BY SEEDSMEN.

Sir,—My attention has been drawn to the above through certain makers asking me to take up their agency, and finding that it is practically all sold in this district by the local seedsman and florist. The order for casks is taken by the "principal or his traveller" from the country gentry or their gardener, and sent on by the maker of the weed killer. But is this in accord with either the Poison Act or the Arsenic Act? Where does the signing of the poison book come in? It clearly is an evasion of the law, both as regards the Poison Act and the Arsenic Act. Of course, the seed merchant or florist does not actually handle it, but, still, there is the fact of it being sent to the gardener by rail (a distance of 80 miles), and no signature given. I have a case under notice at present sent to our leading local family. I think we might with very little energy draw this portion of the trade into the net of the pharmacist. NORTH COUNTRY CHEMIST.

WHY CHEMISTS SHOULD DISPENSE AND DOCTORS PRESCRIBE.

Sir,—Because I have seen, in my short experience, a doctor prescribe for the same patient opium and lead pills and a mixture containing tincture of muriate of iron, a dose of each alternately three times a day, and this as a last attempt to save his patient's life, any thoughtful chemist with "personal interest in his business" would point out what would happen when the lead and iron met inside his patient, and show a doctor the best way to overcome the difficulty, and the law should protect and compensate him for so doing. Then, again, doses. Another prescription which had passed through the London Stores (without comment even) was blocked by me because it contained a non-official dose of prussic acid (i.e., 10 minims three times a day), whereas upon inquiry another acid of similar name was intended. A chemist friend of mine corrected a physician who ordered in one mixture acetate of lead and acid infusion of roses, and gained his thanks. Doubtless other chemists have seen similar cases to these. I have seen others, and believe that such are always likely to occur with any medical man who has a practice of any fair size, where time is precious and conversation of patients' friends often indulged in. The foregoing instances were by medical men outside my present district, where, I am sorry to say, doctors' dispensing is too much in vogue. Chemists want to see the horizon of the desirable change, then all would be benefited; the doctor rise with a clear head for prescribing only, take his patients one by one, put his thoughts on paper for that patient, not wait until he has run forty or fifty, and arrives home and says he can remember what each symptom was, and what each requires. The chemist would soon fall into his groove and discourage nostrum vending, and the Queen's subjects would be much safer under the new régime; and the man who now has the power to accidentally destroy life, and by giving a certificate cover up his errors, would command a higher grade for having voluntarily come out from the ranks wherein suspicion alone may mean his downfall.

Hayward's Heath.

R. O. HAYES.

THE MAJOR EXAMINATION—A SUGGESTION.

Sir,—Since the "Major qualification" and "membership of the Pharmaceutical Society" are occupying so much thought and attention of the craft, I would like, with your permission, to venture a suggestion. If I remember rightly, Mr. Carteighe was deploring the fact that so few went in for the Major examination. Granted that there

are those who have not the desire for the fuller development of the science of their craft, and added to these those who from a pounds, shillings, and pence standpoint view it as almost worthless, yet there are many, very many I venture to think, who have a deep longing to advance beyond the Minor, but are debarred the privilege for many reasons. Finance, the forced charge of pharmacies of relatives, etc., render them unable to be away from home for even a three months' course of instruction. To meet such cases I would suggest that the subjects for the Major be taken one or more at a time, at the discretion of the candidate, and as they are passed they might be placed to his credit until he was entitled to the diploma. If that were allowable, as it is in some examinations, I think a great many would at once start for the Major, and, to say the least, it would tend to the greater development of the scientific knowledge of the subjects of our profession. Since "education" and not merely the "title" is Mr. Carteighe's desire, methinks the Council might be hopefully approached and the concession made. I should be glad to hear what my brother Minors think on the subject.

M. F. C. S.

AUDI ALTERAM PARTEM.

Sir,—Having been M.P.S. ever since passing the Major, I cannot be classed with those who do not support the Society, and therefore hope you will spare a little of your space to "the other side" on the question of amending the Pharmacy Acts. Progress is all very well, and I believe in it as heartily as anyone, but it ought to be accompanied by sound common sense, prudence, and sympathy. I think that in two respects particularly the proposals of Mr. Carteighe can hardly be described as sympathetic. The lot of many a chemist is hard enough, goodness knows, and how much comfort will he be able to expect from the reflection that under the new regulations (should they pass) his wife and family in the event of his death will be deprived of support? At present there is left a hope that things may be kept going until a son be old enough to pass and take charge. We have such an instance in this city. With regard to erasing names from the Register, much objection can be taken on the same grounds. Though, doubtless, cases do arise where extreme action would seem desirable, yet we must remember that to strike a man off the Pharmaceutical Rolls takes away the daily bread, not only of himself, but also of those dependent on him. To vest such power in the hands of an irresponsible Council would be, I believe, a grave error. Witness a recent decision by the Master of the Rolls re the action of the Law Society in erasing the name of a solicitor. A word about the Preliminary. It is wonderful how opinions change when once "the gates are passed and Heaven is won." Those who are not yet through the examinations think them quite stiff enough, but once having shaken hands with the Chairman of the Board, successful men appear only a little too ready to make the Council's little finger thicker for those who follow than the loins were for them. The percentage of failures in the Preliminary is pretty high now, and one result of raising the standard might be, if not to materially increase this percentage, to diminish the entries, which would not prove the unmixed blessing some profess to think. Also of those who passed, many, finding themselves thus early qualified to register as medical students, would forsake the drudgery of pharmacy for the higher and nobler profession. Good men are said to be scarce even now, but the mediocrity of the future will be something wonderful to contemplate. If the members of our Council want to do something which will cause their names to be

"engraved with iron, pen, and lead" let them satisfy that eternal longing and hankering after a degree which possesses the bosoms of all. Let us have some handle worth more than the empty F.C.S., better to eye and ear than A.P.S. and M.P.S., and then the sons of pharmacy will arise and call them blessed, who, with Carteighe and Rymer Young, have striven to raise the level of our lives above the base pursuit of lucre.

Chester.

ONE OF THE YOUNG GENERATION.

COMMERCIAL CREOSOTE.

Sir,—Mr. Dott will, I feel sure, pardon me for adding the following notes on the recent examination of several samples of the above substance, as corroborative of his statement (*Ph. J.*, *ibid.*, p. 708) that "experiment does not confirm some of the statements as to its composition." The creosote of a well-known English manufacturer, on which the reputation of this substance was founded, is stated to be derived from beech wood, and is comparatively uniform in composition; the figures in the table appended, obtained by fractionation of a recently obtained specimen, agreeing closely with those found on previous occasions. It will be noted that the fraction consisting chiefly of guaiaol is very small, whilst the proportion of creosol is relatively high. The samples of continental creosote, probably derived from other sources than beechwood, used formerly to contain from 60 to 70 per cent. or more of guaiaol, and very small quantities only of creosol, but since the introduction into medicine of guaiaol and guaiaol carbonate, the percentage of guaiaol has rapidly fallen, until it is with the greatest difficulty that one obtains a continental creosote containing half that amount, as the following table indicates:—

Creosote.	Sp. Gr.	200°-205° C. Principally Guaiaol.	205°-215° C.	215°-222° C. Principally Creosol.	Above 222° C.
1. English	1·075	6 per cent.	7 per cent.	66 per cent.	21 per cent.
2. Foreign	1·076	7 " "	61 " "	24 " "	8 " "
3. "	1·076	20 " "	67 " "	18 " "	—
4. "	1·077	12 " "	73 " "	15 " "	—
5. "	1·081	22 " "	65 " "	18 " "	—

The boiling point of creosol is 219° C., whilst pure guaiaol boils at 200° C., and they may be conveniently prepared from the fractions boiling at 215°-222° C. and 200°-205° C. respectively. A striking confirmation of the suspicion that a portion of the guaiaol has been removed from the continental samples presents itself in the fact that this creosote has fallen to about half the price at which it was sold less than three years ago. It seems desirable, therefore, that a therapeutic examination of the comparative values of creosol and guaiaol should be made, and either or both of the pure substances, of definite boiling points according to results, be included in the new edition of the British Pharmacopœia instead of the creosote of uncertain source and composition now official.

Southwark, London.

JOHN C. UMNEY.

SHOULD DOCTORS DISPENSE?

Sir,—This question has already been answered by most chemists: doctors, if they condescend to notice it at all, might answer it by another question—Should chemists prescribe? And the doctor has the best of it. He has a legal right to dispense; we chemists have not a right to prescribe, although it may be difficult to get a jury to say so. The doctor, too, if twitted upon his ignorance of drugs, may retort that, if inferior drugs are palmed off on

him the fraudulent druggist, and not he, is the blame-worthy party. The sale by chemists of "patent medicines" at a microscopic profit is beside the question. Surely there can be no reason why doctors should be ready and willing to increase the chemist's income because he sells certain goods at little or no profit. My experience of doctors is that they are perfectly amenable to reason if combined with due respect and courtesy, and that they would rather help than injure the chemist who is ready and competent to serve them. But doctors know very well that it would never do to allow their patients to get their prescriptions made up "where they think proper," and prefer either to dispense those prescriptions themselves, or to send their patients to some chemist who has their confidence. When drug-stores and "cutting" druggists are things of the past, and the old historic houses are worthily represented in every chemist's shop, then and not before will doctor and chemist join hands. We shall have to wait some little time, I fear, for such a consummation.

Cambridge.

OMEGA.

THE BRITISH PHARMACOPOEIA.

Sir,—There are one or two matters which have not been suggested as improvements in a new edition of the B.P. 1st. The paper on which it is printed should be of a better quality. A paper not quite so heavy and much tougher would be a great improvement for a book so constantly in use, and subjected to much hard, often bad, usage as the B.P. From the point of view of the medical man, who, we are told, never uses the book, but who has the whole control of its production, this may seem of no importance, but from the laboratory side it is different. We want a material which will stand hard usage and bear repair. 2nd. The binding should be much more substantial than

it has been in former editions. Instead of being put only in cloth cases and very simply sewn, the sewing should be carefully done on at least three cords, each of which should be firmly laced to the boards, and the back made flexible, to lie open with ease. Then for cover, let that be such as its ancestors were—good plain brown leather. I am doubtful if I ever saw either an E.P., I.P., or D.P. ("Christison" was my guide), but I am sure they were bound in a good, substantial way, as most books were when they were new. But if leather be too dear, let it be covered with a piece of good, substantial canvas, and not with the useless rubbish of which too many cloth cases are now made. Since it seems not to be made to sell, make it to last. 3rd. Do away with the Latin nomenclature. In the good old days the Pharmacopœia was nothing if not Latin, but has been altered in the B.P., and I think wisely so. There is no idea in the Pharmacopœia which cannot be as well expressed in English as in Latin. All the Latin which now remains is the name of each article, followed by a translation into English, e.g., *tinctura opii*—tincture of opium. Authors would be saved writing books of rules for latinising the names of the numberless additions to *materia medica*. It would tend in time to bring about the writing of prescriptions in the language of the country, doing away with an exhibition such as—

"*℞ Mist. creta ℥vi.*

Sig. 3ss. ter in die, after every loose stool."

As a step towards simplification, do away with Latin in the new B.P. 4th. This matter has been often referred to: With a view to maintaining what measure of simplicity has already been attained, do not introduce any new system of weights and measures. It is open to question whether it was wise to do away with the apothecaries' weights and measures, but the reason of the change—viz., to bring about uniformity with the weights and measures in common use—has a great deal to be said for it, and should not be disturbed. Do away with the present minim ^{437.5} 480.0, and replace it by the grain measure, designating that by its former name of minim, and restoring its old value. The fluid drachm would also go, and only the minim (= 1 grain) remain of less value than the ounce (437.5 grs.) In prescribing according to B.P. measures, minims only would be used, except for fl. oz. i., etc. In practice this matter of weights and measures is very much complicated by the signs used and quantities intended in physicians' prescriptions. Here they have proved themselves very conservative, for though thirty years have passed since the issue of the first B.P. and the adoption of the avoirdupois system, it is a very rare thing to see other than the old symbols used—℥j., or ℥j.—never or seldom fl. dr. j., or fl. oz. j., or oz. j., which are, strictly speaking, very different things. It is about thirty years, too, since it was made legal to use the metric system for purposes of trade in this country, but it has made practically no progress towards general adoption, and shows no sign of doing so. Therefore, until the physician shows some sign of giving up the old convenient forms in his prescriptions, or there is some progress towards the adoption of the metric system or even a decimal system for common use, do not make confusion worse confounded by introducing the former into the new B.P.

R.

PHARMACEUTICAL POLITICS.

Sir,—Every chemist who has read the public utterances of the President, recently delivered, must have felt satisfied with the comprehensive policy therein set forth. I am afraid, however, that but little satisfaction can be entertained at the practical results hitherto arising therefrom in the requisite increase of new members. There cannot be two opinions about further legislation being necessary to place matters upon something like a fair basis, and thus remove the gigantic impositions chemists have at present to contend against. Even disinterested people altogether unconnected with the trade not unfrequently remark upon the present unfair and illogical state of things. We have tried what I think may be very well described as a Micawber policy during the past twenty years or so, and I believe every chemist in the kingdom will now be prepared to admit that this *laissez faire* policy has not been attended with even fractional success. If we are to have a healthier state of things we must wake up by determinedly adopting a policy of reform with a view of turning the existing inequalities into equalities, and, to adopt the wording of an old adage, "If we don't at first succeed we must try, try again." The President laid it down as a cardinal point that before taking action he must have not less than two-thirds of the chemists of Great Britain to back him in his legislative efforts. I think that, considering the existing conditions, there ought to be nine-tenths, when, with intelligent agitation, I feel sure that we should ultimately obtain our deserts. My main object in writing this letter is to suggest that, in order to obtain

the necessary complement of supporters, a circular letter should be sent to each local secretary throughout the country, urging him to arrange with his fellow-members to canvass all non-members in his district with a view of getting them to join in the campaign. I believe a personal canvass of this kind would result in a following more considerable than that the President regards as necessary. In conclusion, I would heartily endorse the opinion already expressed, that, with regard to qualification for the Council, all legally qualified chemists should be on the same footing, and that the Pharmaceutical degree should be a purely honorary one. If pharmaceutical chemists are better men, they will secure their full share of representation by virtue of their superior attainments. By adopting this course a fruitful source of dissatisfaction would be removed, and the prospects of strengthening the Society materially increased.

Ashby-de-la-Zouch.

G. W. BULLEN.

A CORRECTION.

Sir,—The value of Gravill's capital paper on the determination of carbonate of ammonia in spirit of sal volatile is greatly marred by a simple error. His statement that 14.67 grains of carbonate is the B.P. complement of a fluid ounce proves that he has credited the B.P. ounce with 480 grains. This error is the more remarkable as he has avoided that of Thresh and Attfield concerning the strength of B.P. solution of barium chloride. The barium chloride test is very difficult, and I hope will be abandoned. Gravill's process is very promising, but requires further probation before receiving official rank. Liversidge's standard appears to me too high, the total CO₂ contained in 5 C.c. of the spirit being only 37.56 C.c.

Stockton-on-Tees.

THOS. BRATSHAY.

THE BENEVOLENT FUND.

SIR,—Whilst looking through last week's issue with a friend, I noticed his name absent from the list of subscribers. I asked why he had not sent in his subscription, and he said that he had never been asked for it. It occurred to me that many of our number have put themselves in a similar position, and expect the local secretary to call for their subscriptions to this fund. If not out of place, I would here suggest that those local secretaries who do not make a call on the chemists in their districts should do so soon, whilst the subscription list is still fresh in the memory of every recipient of the Journal. I notice several towns where to my knowledge the local secretaries are active on this point and send in really good amounts, whilst many towns never send a penny, and in those places there are chemists who have big businesses and assistants earning fair salaries, all able and I hope willing to contribute if asked by some one in authority.

ASSOCIATE.

Answers to Correspondents.

W. H. Burrell.—Iodine with potassium iodide and hydrochloric acid will give a crimson; copper nitrate a green; and potassium chromate a yellow. Dissolve in water until satisfactory tints are obtained, filter and, after standing for some time to deposit, decant off clear solutions. Write again if you require further information.

A. B.—It is made in the United States. Probably Messrs. Munn and Co., 361, Broadway, New York, could give the information you ask for.

Jas. Robb.—There is no immediate intention of publishing a general index to the Journal, as there does not appear to be sufficient demand for it to justify the expense.

COMMUNICATIONS received from Messrs. Austen, Bullen, Campbell, Church, Cope, Hayes, Helbing, Hill, Knoll, Lunan, Michells, Nightingale, Ransom, Robb, Smith, Umney, Whinerey, Whittaker, Wood, Wright, Young.

THE CHEMICAL HISTORY OF ACONITINE.

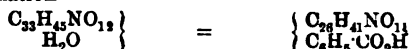
A REPLY TO MR. W. R. DUNSTAN.*

BY MARTIN FREUND.

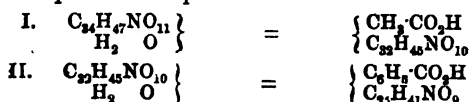
Last year I published, in conjunction with P. Beck, an investigation of aconitine, a preliminary communication, which contained the results of our work, appearing first,† and subsequently a more extended memoir, with the experimental data.‡ In the same number of the *Berichte* in which the latter appeared,§ there was also a notice by Mr. Dunstan, which I have hitherto left unanswered because it was there stated to be the intention of the writer to discuss the formulæ we had given, and I anticipated having then an opportunity of replying to the false statements contained in that notice. But as a year has now elapsed without Mr. Dunstan having carried out his declared intention, it is not therefore necessary that I should defer any longer a correct statement of the facts.

In the preliminary communication above mentioned, Beck and I stated that the formula $C_{33}H_{45}NO_{12}$ assigned to aconitine by Wright, and modified by Dunstan, was incorrect, and that it should be replaced by $C_{33}H_{45}NO_{11}$.

While the hydrolytic splitting of aconitine was represented by Wright—and also by Dunstan—by the equation—



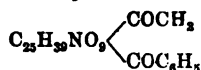
we showed, on the contrary, that this alteration takes place in two phases—



We further produced evidence that the product $C_{33}H_{45}NO_{10}$, resulting according to equation I., was identical with the "isaconitine" of Dunstan, to which he had assigned the formula $C_{33}H_{45}NO_{12}$ as being an isomer of aconitine.

We also showed that the product $C_{25}H_{41}NO_9$, resulting according to equation II., was identical with aconine, for which Dunstan had confirmed the formula $C_{25}H_{41}NO_{11}$, assigned to it by Wright.

Lastly, we deduced from our observations the ultimate conclusion that aconitine is to be regarded as acetyl-benzoyl-aconine—



Although in the above-mentioned notice by Mr. Dunstan he deferred to "a future occasion" the discussion of our formulæ which differed so much from his own, he hastened to make a claim of priority in regard to the results which had been communicated by us.

I do not consider the result of our investigation of sufficient importance in itself to be worth entering into a dispute as to priority. But the statements of Mr. Dunstan are so contrary to the facts of the case that I cannot allow them to pass without contradiction.

Mr. Dunstan asserts that the observation that aconitine splits up first into acetic acid and isaconitine had already been published by him on January 27, in the *Proceedings of the Chemical Society*.* In contradiction of that statement, I affirm that in those "Proceedings"—which, so far as I am aware, contain abstracts prepared by the authors of the papers read—isaconitine is throughout treated of as the isomer of aconitine, and not as a product of its splitting.

Mr. Dunstan has published in the same number of the "Proceedings," the observation that aconitine heated dry to 190° C., loses one molecule of acetic acid.† In the notice published in the *Berichte* he says: "The obvious conclusion that aconitine must be acetyl-benzoyl-aconine, and the so-called 'isaconitine' benzoyl-aconine, though not stated in so many words in the abstracts, is given in the original papers which appear in the number of the *Journal of the Chemical Society* now being published."

In the first place, I have to mention that the production of acetic acid in the hydrolysis of aconitine had already been demonstrated in 1892 by Ehrenburg and Purfirst.‡ I affirm, moreover, that there is not in the "Proceedings" one single word to indicate the above-mentioned "obvious conclusion." Only in one place is it mentioned that the authors (Dunstan and Carr) are at present engaged in investigating "whether aconitine may not be an acetyl derivative which loses its acetyl group on hydrolysis," and then there is in the "Proceedings" this further statement: "If the latter view should prove to be correct, the nomenclature and formulæ of aconitine derivatives will need entire revision."

I come now to the contents of the "original papers," which were published in the March number of the *Journal of the Chemical Society*,§ while the previously mentioned number of the "Proceedings" was issued on January 27, and our paper (sent in on February 8) was published in the *Berichte* on February 19.

In these "original papers" the point which is referred to in the abstracts as having to be ascertained, has all at once become a demonstrated fact. The nomenclature and the formulæ of aconitine derivatives are altered—aconitine is represented as acetyl-benzoyl-aconine, and isaconitine as benzoyl-aconine. Mr. Dunstan appears, however, to have overlooked the fact that in the first of the three papers—in the same number—isaconitine is expressly represented to be an isomer of aconitine, and on that account it is proposed that the name "picroaconitine" should be abandoned. In favour of his very suddenly acquired new views, Dunstan was compelled to throw overboard the formulæ he had employed for several years. Since the old isaconitine formula, $C_{33}H_{45}NO_{12}$, requires almost the same values as the newly adopted one, $C_{31}H_{43}NO_{11}$, Mr. Dunstan resolved upon making that alteration on the basis of a single

* *Proc. Chem. Soc.*, 1894.† *Ibid.*, 67.‡ *Journ. f. Prakt. Chem.*, xlv., 604.

§ 1894, p. 174-176, Dunstan and Harrison, viii., "On Picroaconitine"; p. 176-182, Dunstan and Carr, ix., "The Effect of Heat on Aconitine and some of its Derivatives," "Formation of Pyraconitine"; p. 290-292, Dunstan and Carr, "Further Observations on the Conversion of Aconitine into Isaconitine."

* Translated from the *Berichte* of the German Chemical Society, issued February 25, 1895. Fp. 192-195.† *Berichte*, xxvii., 423; *Pharm. Journ.*, liii., 729.‡ *Berichte*, xxvii., 720; *Pharm. Journ.*, liii., 813.§ *Berichte*, xxvii.; *Pharm. Journ.*, liii., 735.

gold determination although it was not in accord with a whole series of analyses of the gold salt, which agreed well with the old formula.

Calculated for the old formula.....21.46 per cent.

" " new " 22.50 "

" Found.....22.18 "

No new analytical data at all were given for aconine, but the old formula, $C_{20}H_{33}NO_{11}$, was altered without further consideration to $C_{24}H_{35}NO_{10}$.

It is upon such a publication that Mr. Dunstan bases his formulæ and his claim to priority! Between his formulæ and those we have proposed to adopt there are, however, such differences in the corresponding amounts of carbon that a decision between them is very easy to make. Since, however, Mr. Dunstan has not entered upon the discussion he intended, his silence must be accepted as an acknowledgment of the accuracy of our formulæ.

For the rest, after having waited for a whole year for a reply from Mr. Dunstan, I shall no longer hesitate to seek for additional evidence in support of our formulæ by a further investigation of aconitine and its derivatives.

THE APPROACHING REVISION OF THE BRITISH PHARMACOPOEIA.

FROM THE POINT OF VIEW OF A PHARMACIST

BY W. A. H. NAYLOR.

The views expressed by Dr. Lauder Brunton under the heading of "The Approaching Revision of the British Pharmacopoeia" are emphatically those of a prescriber, and are entitled to the respect of all thoughtful pharmacists. It is impossible to rise from the perusal of the article without the conviction that this gentleman desires not so much to extend by explanatory sentences the information already supplied by the Pharmacopoeia as to alter its character. The result of the change he proposes would be to make it a combination of "The Elements of Pharmacy" with suggestive hints on the "Art of Dispensing and Prescribing." His recommendation that the volume should be informative up to a certain point on those subjects is based upon his statement that the Pharmacopoeia is primarily intended for the medical man, and that this individual may be assumed not to possess even an elementary knowledge of the properties of the drug he prescribes. Hence he contends that the Pharmacopoeia ought to instruct him that ether will burn and that its vapour is inflammable, and therefore should not be brought in proximity to a fire. The same precaution is to be repeated under the heading colloidion. Truly this is a revelation of ignorance on the part of the medical fraternity, which will come to the pharmacist in the light of a surprise. But this eminent pharmacologist goes a step further, and asks that the approaching revision shall give the result of chemical changes which may be brought about by the admixture of two or more ingredients which a medical practitioner may have it in his mind to prescribe. Thus the characters and tests of perchloride of iron should include an instruction to the effect that when brought into contact with iodide of potassium free iodine is liberated. In like manner that borax when dissolved in glycerin sets free boric acid. In short, Dr. Brunton's demand appears to be for a

prescriber's manual rather than a pharmacopoeia. The want of knowledge of pharmacy which he assumes his brethren to possess may be gained by a careful study of one of the admirable text-books devoted to the exposition of the principles of this branch of medicine, whilst acquaintance with chemical reactions can be appropriately made through the agency of an elementary text-book of chemistry. As to the form, in respect of elegance and palatability, in which a remedy should be administered, is it too much to suggest that the trained pharmacist might, with advantage to the patient and credit to the prescriber, be more frequently consulted? The suggestion that the Pharmacopoeia should follow the lines of Squire's 'Companion' or the 'Extra Pharmacopoeia' is not one that could efficiently be carried out, in view of the long intervals that elapse between the issue of successive editions. The same objection applies to the act of regarding the volume in the light of a student's treatise on pharmacy. An educational work is mainly valuable to the extent that it reflects present-day knowledge. The intention of the Pharmacopoeia is to supply standards to which the remedies named therein shall be referable in respect of their nature and composition, thereby ensuring uniformity. The question arises, can the scope of the original intention, as expressed by the Medical Council in the present British Pharmacopoeia, be usefully enlarged? The proposed introduction of the imperial element, which has met with widespread approval so far, gives an answer in the affirmative. Should not a pharmacopoeia be confined to giving authoritative directions for the making of standard medicines, and to supplying characters and tests for indicating the genuineness and quality of the drugs, and the composition and purity of the chemicals therein referred to? On what lines may we work in the hope of effecting improvement in the projected Imperial Pharmacopoeia? Are they not briefly these:—

(a) Improved methods and formulæ for the production of some of the Galenicals—notably tinctures and ointments.

(b) An extension of tests, with more precise directions as to their mode of application.

(c) The omission altogether of the class known as cataplasma.

(d) The omission of detailed directions for making definite chemicals which are known to be produced only on the manufacturing scale, and the purity of which can be ascertained by the application of suitable tests.

(e) To meet the convenience of prescribers by admitting of easy calculation, the potent remedies represented by liquor arsenici hydrochlor., strychnine and sodii arseniat., should have a strength of x. grains in 100 minims.

(f) A possible increase in the number of liquid extracts and injections, employing for the latter a preservative suitable in each case.

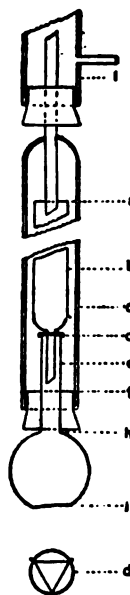
(g) An avoidance of too free a use of synonyms.

(h) The inclination to multiply standardised preparations, to be yielded to only when it is known that the preparation is capable of producing the therapeutic effect desired.

(i) The adoption of the metric system of weights and measures, and the introduction of a table of solubilities.

I am satisfied that the gentlemen elected by the Council of the Pharmaceutical Society, at the instance of the Medical Council, to assist in the revision of the Pharmacopœia will bring to the prosecution of their task zeal, knowledge, and honest work, qualities the patient exercise of which in the daily practice of their craft has deservedly elevated them to a foremost position in the domain of British pharmacy.

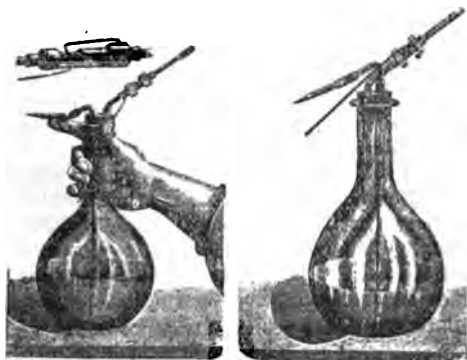
NOVEL LABORATORY DEVICES.



MODIFIED KNORR'S EXTRACTION APPARATUS.—This modification of Knorr's apparatus is suggested by Oma Carr (*Journ. Am. Chem. Soc.*, xvi., 868) to obviate several inconveniences associated with the ordinary form. To the inverted percolator-dome *c*, is adapted a tube, *a b*, of convenient size, the shoulder of which is supported by the small triangle *d d*, arranged upon the rounded top of the flask neck. The flask, of 100 C.c. capacity and without a rim at the mouth, should project above the cork *f*, about two inches. To bring extract-solutions to definite volume, the apparatus should be sunk in a water-bath to a sufficient depth to prevent the solvent accumulating upon the cork *f*. It is readily adapted to the condenser of the Knorr extractor, as shown at *l*, and upon completion of the extraction the cork *f*, is easily removed, and the flask wiped and dried

without danger or annoyance being caused by mercury globules.

NEW WASH BOTTLE.—The wash bottle shown in the illustration represents the form that G. C. James (*Scient. Amer.*, lxxii., 5) has found convenient for hot water, etc. One figure represents the bottle complete ;



the other shows it in use, and also shows a large scale view of the valve. Its construction is obvious. The wire crosses a piece of rubber tubing. When the wire is depressed it squeezes the tubing against the

wooden block on which it is mounted and thus closes it valve-fashion. The middle finger controls the wire of the valve, allowing the free use of the first finger to direct the stream—a great improvement on other similar apparatus. When the bottle is reversed, the middle finger also controls the stream issuing from the mouth tube—a very convenient feature. After a short use of the bottle, one soon becomes accustomed to the mechanism, so that the mouth and hand work together. The air chamber ordinarily above the water is sufficient to eject the water for five or ten minutes, and with the hot water bottle it is only necessary to shake the water, and the steam liberated is ample to force the water from the top. Another great advantage is that one runs no risk of burning the mouth, as the valve prevents the steam returning until the mouth is removed.

THE APPROACHING REVISION OF THE BRITISH PHARMACOPOEIA.*

PHARMACEUTICAL DEFECTS IN THE PRESENT BRITISH PHARMACOPOEIA FROM THE MEDICAL POINT OF VIEW.

BY WILLIAM WHITLA, M.D.,

Professor of Materia Medica and Therapeutics in the Queen's College, Belfast; Physician to and Lecturer on Medicine in the Belfast Royal Hospital.

The announcement that the General Medical Council have commenced operations for a revision of the national Pharmacopœia has been received with no small amount of interest by the medical profession. This interest has not diminished since the publication of the debate upon the presentation of the report of the Pharmacopœia Committee to the Council, which doubtless has had the effect of directing the attention of the profession more closely than usual to the methods by which the revision is proposed to be carried out. The General Medical Council, and especially the able and untiring Chairman of the Pharmacopœia Committee, have earned the gratitude of every medical practitioner at home and in the Colonies for their labours in former revisions.

It is, therefore, in no spirit of fault-finding or censoriousness that it is proposed to examine the methods by which the revision in former years has been carried out. We must look at the inherent difficulties of the work with the view of finding out if possible how they may be overcome or minimised, and, if possible, how a higher standard of excellence may be reached in the next issue of the Pharmacopœia. The work must always be regarded from two very distinct standpoints—namely, from the point of view of the pharmaceutical chemist and that of the practitioner of medicine. The Pharmacopœia is designed as a guide or aid to the pharmacist who dispenses, as well as to the physician who prescribes the remedies for disease. The General Medical Council have always broadly acknowledged this, and, in addition to engaging a number of pharmaceutical experts to assist in the work, they return thanks in the preface to the last

* From the *British Medical Journal*.

edition "for assistance received from several of the medical authorities, scientific bodies, medical practitioners, and from pharmacists."

The circular sent out to the medical bodies in December last states that the Pharmacopœia Committee appointed by the Council "are desirous of enlisting the co-operation of the medical authorities and such other bodies and persons as may be able to furnish useful information, with the view of rendering the work as complete and accurate as possible."

By approaching the new revision in this broad spirit, the Parliament of Medicine has shown itself worthy of the trust reposed upon it. At the same time it is obvious that the work cannot be expected to be a success unless the help of medical experts be engaged, and associated in the revision with the distinguished pharmaceutical authorities at present employed in the undertaking. From the nature of the work to be done it is impossible for the editing of the medical side of the Pharmacopœia to be satisfactorily accomplished by a committee of the General Medical Council. Supposing that the medical bodies, universities, and teaching organisations take the matter up earnestly, it might be contended that their valuable assistance could be made to take the place of a medical editor or editors. A little reflection will, however, show that medical editorship would probably be only the more necessary under such circumstances. One or more physicians who have devoted themselves to the study of pharmacology and therapeutics would be required to weigh the mass of recommendations and opinions out of which the new Pharmacopœia is to emerge. There can be little doubt that experts could be found in London who would undertake the labour, and whose duty it would be to collaborate with the pharmaceutical editor as the work of revision advanced. It is the writer's opinion that only in this way can a Pharmacopœia be brought out which will index the medical mind of the nation or be creditable to British medicine.

When one examines the present (1885) volume with its additions of 1890, it becomes apparent that many blemishes and imperfections would have been impossible had a medical expert been made responsible for the medical portion of the work. Thus the entire dosage would have been revised and brought into line with the therapeutics of the day; but as the question of the poeology of the British Pharmacopœia is to be treated in a subsequent article, nothing further need be said upon the subject in the present paper.

A few examples of pharmaceutical defects in the present volume may, however, be looked at from the medical standpoint with advantage. Opening the British Pharmacopœia at the second page one cannot fail to be struck with the question why such an unstable and non-uniform preparation as acetum is still permitted to encumber its valuable space, while we have the acidum aceticum dilutum of practically the same strength. As little can be said for the acetum cantharidis.

Passing over such practically worthless encumbrances as the nitrate and phosphate of ammonium, sulphate of beberine, bael fruit, canella and cassia

pulp, we come to the group of cataplasmata, the retention of which is a serious blemish upon our national Pharmacopœia. The formula of almost every member of the group may be safely pronounced to be at variance with present therapeutic knowledge and experience. One of the most obvious blunders is the directions for preparation of the cataplasma of hemlock, namely, the instruction to evaporate the hemlock juice to half its volume. The result of this is to completely destroy the property of the drug, unless indeed the evaporation be carried out at a low temperature, which is not stated. Moreover, as it is impossible for the chemist to make and supply these poultices, it is difficult to see why they have been retained. It is probable that few physicians, when ordering a mustard poultice, intend that the official mustard cataplasma, which consists of an equal quantity of linseed meal and mustard, should be applied, nor is the official mustard paper recognised by physicians as a success.

There was a time when something might have been said for the retention of the sulphates of cinchonine and cinchonidine, but from a therapeutic point of view the two pages devoted to their characters and tests are at the present day worse than lost space.

The confections may be regarded as belonging to a past time, and as veterans they lag superfluous on the stage; those of scammony, hips, opium, and, perhaps, turpentine are seldom used. Much may be said for the retention of confections of sulphur, pepper, and senna, but when one considers that the latter preparation contains nine substances, four of which (that is, figs, tamarinds, cassia pulp, and prunes) are solely retained for its preparation, it is obvious that the confection of senna is retained at serious cost, especially as the pharmaceutical process directs the rejection "of the seeds and other hard parts" upon which the laxative properties of its ingredients to a considerable extent depend. If the directions for evaporating the confection at the end of the process be followed the active principle of the senna is very considerably destroyed, and this official representative of polypharmacy is rendered almost useless, as is also the case with the syrup of senna.

The decoctions and plasters afford numerous examples of inert preparations, but perhaps the small group of enemata afford the best examples of official preparations framed in opposition to the recognised principles of physiology and therapeutics. Thus, the enema of aloes is made to measure 10 ounces, and that of sulphate of magnesium 16 ounces, quantities which obviously cannot be retained for any time in the body. It is clear that these five preparations should be excluded, as the physician can give directions when he wishes to use enemata of asafoetida and opium, the only members of the group of any utility.

The space of the present article does not permit of a review of the numerous extracts, many of which are seldom employed, and some of which—notably conium and dandelion—are inert when the official formula is followed. It has been demonstrated that the hemlock extract may safely be swallowed in enormous doses, its active principle having been destroyed by the high temperature of the

evaporation. Perhaps no more obvious example of the defect of a pharmaceutical preparation could be mentioned than that of glycerin of borax. Formerly this valuable preparation, which was faintly opalescent, consisted of 1 ounce of borax dissolved in 4 ounces of glycerin, but in the last revision 2 ounces of water were added, the result being a thin bright liquid, which does not adhere to the diseased mucous membrane, but immediately flows off, and is practically valueless as a therapeutic agent. By using the borax in crystals a clear, bright and adhesive liquid would have resulted. The utility of the preparation was sacrificed to elegance in pharmacy, whilst a little more pharmaceutical knowledge would have redeemed it.

The entire group of infusions should be revised, and most, if not all, must be omitted from a medical point of view. Their strength and actions vary so much and they are so liable to spontaneous changes, even when combined in mixture form with other drugs, that the days of this form of Galenical preparation are already numbered, and, as Professor Leech has shown, they have practically disappeared from the other pharmacopœias of the world.

Another group of preparations which shows serious defects is the mucillages, though some of these could be easily remedied. Thus mucilage of acacia, which soon becomes acid when kept in ordinary vessels, might retain all its properties fresh if the Pharmacopœia supplied the directions for enclosing it in small sealed phials completely filled and excluded from the air and light. It is a common occurrence to see mischief caused in the treatment of stomach affections by this acid mucilage, especially as it is so often used to suspend bismuth. For similar reasons the hypodermic injections are actually dangerous; ergot decomposes, and when injected abscesses result, a state of matters which could be easily avoided; indeed, much can be said for excluding all preparations liable to speedy spontaneous decomposition. The injection of morphine requires serious attention. It is quite too powerful; every minim contains one-tenth of a grain, and no matter how careful the physician may be, he is liable to inject one or two minims more than he intends. Owing to its strength the writer regards it as a positively dangerous preparation, and it is probable that death has resulted from its use in the hands of young physicians not accustomed to the daily use of the hypodermic syringe. The introduction of discs or tabloids containing alkaloids in soluble form should replace these unstable injections.

The practically inert aromatic mixture of iron known as Heberden's ink and the vinum ferri are still left as blemishes; they are valuable chalybeates no doubt, but only in the absence of the host of reliable preparations of iron. The same remarks will apply to the pill of iodide of iron.

The saccharated carbonate of iron may be instanced as an example of reform urgently required in the official pill masses; "this carbonate (if reckoned as anhydrous) forms about one-third of the preparation," but commercial specimens, prepared by the official process, generally are found to yield about 20 per cent. of real ferrous carbonate. The dose of the prepara-

tion is given as 30 grains, which would mean, when mixed with the official excipient, about one dozen fair-sized pills.

Extractum rhamni frangulæ (never used as an excipient) has its dose fixed at 15 to 60 grs. This means that when made into firm pills of fair size the number required to be administered will amount to at least from 4 or 5 to 15 or 18. The dose of many other extracts introduced into the Pharmacopœia for administration as pills is so large and bulky as to render them useless; this becomes even more evident when one remembers that the prolonged evaporation deteriorates their active principles.

Of the 51 liquors, 18 syrups, 18 spirits, and 75 tinctures, much might be said from a purely pharmaceutical point of view, which is outside the scope of the present article. That only a very small percentage of these 162 preparations are in use amongst practitioners cannot be denied, and the reason is obvious—their strengths and doses are so various that it is found impossible to remember either, and after the ordeal of the examination in materia medica is got over the young physician breaks acquaintance with the great majority of his official friends, and too often drifts into the daily use of semi-proprietary or ready-made pharmaceutical compounds, or else settles down to the routine use of a very limited selection of British Pharmacopœia drugs and their preparations.

The lozenges are a very doubtful addition to the Pharmacopœia, and the recent perfection of the manufacture of tabloids should suggest the advisability of excluding these remnants of the old-world pharmacy altogether. If administered for their local action upon the mucous membrane of the mouth and fauces the sugar, mucilage, and gum seriously interfere with the action of some of them. If this group of preparations is to be retained a plea must be made for a lozenge containing carbolic acid, such a lozenge would be worth more than the present list of thirteen.

There are no fewer than forty-five unguents in the present Pharmacopœia, and upon these a separate article might be written with advantage: from the medical standpoint the chief objection is the lamentable want of anything approaching uniformity of strength. Thus the list of forty-five unguents will be found to contain preparations of no fewer than twenty-eight different strengths. In objecting to the want of uniformity in the strength of tinctures and Galenical preparations to be swallowed it always can be answered that the dose is an item to be considered, but in dealing with ointments, many of which are inert, there is certainly less to be said against uniformity of strength. It is rather surprising to learn that out of a total of forty-five of these preparations, there are twenty-eight of which no two are of the same strength. The result of such an arrangement is that the physician learns practically to ignore the official list, and, when he requires an unguent, writes a recipe for a preparation of his own, as it is almost an impossibility to remember the strength of even a fair percentage of these preparations. An even more serious objection to the

group is the unfortunate selection of a basis consisting of a mixture of hard and soft paraffin in several of them. If anything can be said for such a basis from a pharmaceutical point of view, experience proves that it is objectionable from a medical point of view, and in some ointments it destroys their usefulness. As a rule, the official directions for the making of ointments are very defective; in no place is it made clear that the powdered substance is to be rubbed laboriously and patiently with a very small quantity of the basis before the remainder is added; there is no class of preparation requiring so much care and skill, and such curt directions as "mix thoroughly" are insufficient.

The vapours of the British Pharmacopœia are seldom employed and so out of touch with modern therapeutic notions that, like the cataplasmata, they are so certain to be excluded in the approaching revision, that nothing need be said of them. The wines should probably also be excluded, for if sherry or other wine be found in any particular case to be a better menstruum than weak spirit, it may be used, and the resulting preparation called by its proper name—a tincture. The vinum ferri should certainly be excluded; the quantity of iron contained in it is most variable, but never enough to be of any therapeutic value when given in the official dose of 1 to 4 drachms.

The above-mentioned objections are given not as a complete list of the pharmaceutical defects in our rational Pharmacopœia, but as a sample of what must be remedied if the new work is to become one of which we shall not be ashamed. They go to prove conclusively that the valuable suggestion of Dr. Lauder Brunton should be acted upon—that "skilled labour and much experimental work, necessitating the expenditure of a good deal of time and money," should be provided by the General Medical Council.

If this is obviously necessary for the judicious weeding out of the grave defects and worthless drugs and preparations in the present British Pharmacopœia, how much more obviously necessary is it for the introduction of new remedies and new Galenical preparations—a subject not within the scope of the present article.

We trust that the compilers of the work will not be

The first by whom the new are tried,

but the profession in all English-speaking countries will doubtless also hope that they will not

Be yet the last to lay the old aside.

An analysis of the inconsistencies and lack of uniformity evident all through the 1885 issue proves that these arise from the patchwork nature of the original issue in 1867, when the compilers had to reconcile the various interests represented in the old Edinburgh, London, and Dublin pharmacopœias. This Herculean task was accomplished with great ability, but the time has now come when the work must be undertaken in a totally different spirit, and the revisers must go to the root of the matter and produce a volume which will be an index of the advanced pharmacy and therapeutics of the day. The great and only danger appears to be that of haste; it will take at least a few years before this result can be accomplished.

NOTES ON RECENT SCIENTIFIC INVESTIGATION.

FORMATION OF SECRETIONS IN PLANTS.—Dr. A. Tschirch announces the remarkable discovery that in all normal cases which he has been able to examine the formation of a secretion it is a function, not of the protoplasm, but of the cell-wall. In schizogenous passages the secreting cells which clothe the canal contain a resinogenous layer, which is often vacuolar; in schizo-lyigenous cavities the secretion is formed in peculiar caps of cell-wall belonging to the cells which enclose the space. In the oil glands of the Labiata, Compositæ, etc., it is produced entirely in a subcuticular layer of the cell-wall, and this is the case also with the papillæ which project into the intercellular spaces of the rhizome and base of the leaves in *Aspidium filix-mas*, and in many, if not all, extra-floral nectaries, the secretion lifting the cuticle off from the palisade-like secreting tissue. In all stigmas examined by the author, the secretion is formed in the subcuticular mucilaginous layer of the papillæ, into which the pollen tube makes its way. Similar observations were made on the oil of oil glands, and on the resin which is formed in the duramen of trunks. But, although the secretions are formed in the cell-wall, they are never produced by metamorphosis of the substance of the cellulose itself. Dr. Tschirch ascribes to all resins a uniformity in chemical composition, regarding them as compounds of aromatic acids with a peculiar group of alcohols which he calls resinols. (*Botanisches Centralblatt*, Vol. lx., 1894, pp. 289-293.)

Herr A. Bécheraz has studied the mode of formation of the secretion in schizogenous receptacles, especially in the elongated cavities of the Abietinæ, Compositæ, Umbellifera, Burseracæ, and Clusiaceæ. He finds the secretion to be present in these receptacles from the earliest stages of their formation, while none is contained in the cells of the surrounding tissue. Resin could never be detected outside the resin passages. A group of cells, early distinguished by their colourless contents, arising from the mother-cell of the canal, forms a coating of mucilage where these cells adjoin the epiderm, and this mucilage contains the resinogenous substances. The extent to which the canal is ultimately filled with resin varies greatly. A membranous structure, the inner pellicle, is formed at the point of contact of the resin with the layer from which it springs, and often contains granules of various kinds. (*Mittheil. Naturf. Gesell. Bern*, 1894, pp. 74-109).

According to M. G. Bonnier, the production of honey or nectar in plants is greatly influenced by the nature of the soil. Thus the white mustard produces a much larger quantity on a calcareous than on an argillaceous soil; the buckwheat more on a siliceous than on a calcareous soil. An argillaceous soil is favourable to the production of honey in *Phacelia tanacetifolia*, a calcareous soil to its formation in *Isatis tinctoria* and *Medicago sativa*. The sainfoin is nearly indifferent to the nature of the soil ('*C. R. de l'Assoc. Française pour l'avancement des Sciences*,' 1894, pp. 567-569).

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MARCH 9, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

At the meeting of the Council on Wednesday, one-third of the members were absent through indisposition or for other reasons. After the usual preliminary business, a letter was read, in which Mr. BURROUGHS acknowledged that in which the Council had expressed its sympathy on the death of Mr. S. M. BURROUGHS. This was followed by elections—6 members, 23 associates, and 42 students—after which the report of the Finance Committee was considered. The chief items of expenditure were in connection with the new buildings at Edinburgh, and it was stated that certain extras involved an addition to the original estimate for these of between £400 and £500. Altogether, some £2500 had been expended on capital account, and £500 on apparatus and materials. On the Benevolent Fund account, a donation of £50 had been received from Major PROBYN, one of ten guineas from Mr. J. G. RICHARDS, Hastings, and one of five guineas from Mr. TRICKEY, Eastbourne.

There was nothing of special importance in the Benevolent Fund Committee's report, and the only items of interest in that of the Library and House Committee referred to the insurance of the Society's premises in Scotland, and a grant to the Sheffield Pharmaceutical and Chemical Society for educational purposes. The amount of the latter had been fixed, after careful consideration, at £25 rather than £50, in the hope that local contributions might be forthcoming to a similar amount. The preparation of the annual report was referred by the Council to the Library and House Committee, as usual, and it was resolved to hold the annual meeting on Wednesday, May 22 next. A letter had been received from Mr. CHAS. UMNEY, suggesting that application should be made for permission to give evidence from a pharmaceutical point of view before the Select Committee of the House of Commons, which would deal with the Weights and

Measures Act Amendment Bill, introduced by the London Chamber of Commerce (*ante* p. 588). A resolution appointing the PRESIDENT and Mr. MARTINDALE to give evidence on behalf of the Council, on permission being obtained, was passed accordingly. The death was announced of two corresponding members of the Society: Mr. ANDREW FREERIN, Chemist to the Government Medical Council, Moscow, and M. JEAN EDOUARD BOMMER, Curator of the Botanical Gardens, Brussels. The PRESIDENT pointed out that both were distinguished in their respective lines of work, and said it was only right that their loss should be recorded on the minutes. Mr. WM. GREGORY was appointed local Secretary for Weymouth, and authority was given the Registrar to make proof of debts owing to the Society, after which the report of the Law and Parliamentary Committee was read.

This report contained a recommendation that no Bill be introduced in Parliament at present, and the PRESIDENT said that the Committee felt it was hopeless to move during the current session of Parliament, owing to the congestion of public business. At the same time there was no desire to forget their obligations to the many active associates in business who were doing such excellent work throughout the country. Mr. HARRISON regretted the decision that had been come to, and strongly objected to an indefinite postponement of the matter. It would not be right to defer consideration of it until the eve of another session, and he thought an early opportunity should be taken of formulating a scheme embodying what was generally demanded. This might then be considered by the members before the autumn meetings, and a healthy public opinion be formed with regard to it, besides which a certain measure of enthusiasm might be usefully called forth. The Committee ought to meet again at an early date to formulate a scheme, or the same difficulty would occur again. It was his intention to press the consideration of the curriculum, consolidation of the Society, and company trading. Mr. MARTIN agreed with the opinions expressed by Mr. HARRISON, but Mr. ATKINS thought the Committee had acted very prudently. After some further criticisms by Mr. SOUTHALL, however, the action of the Committee was agreed to.

THE PHARMACOPŒIA AS A THERAPEUTIC GUIDE.

THE *Apotheker Zeitung*, in referring to the contemplated revision of the British Pharmacopœia, mentions the suggestion, made at the last meeting of the General Medical Council, to introduce information of a therapeutic nature as an assistance in the administration of medicinal agents and in prescribing. This suggestion is considered by our contemporary to be totally opposed to the proper character of a pharmacopœia.

APPENDIX TO THE GERMAN ARZNEIBUCH.

THE supplement to the 'Codex Medicamentarius' has been closely followed by an appendix to the 'Arzneibuch für das Deutsche Reich,' or third edition of the 'Pharmacopœia Germanica.' But whereas a period of eleven years has elapsed between the publication of the original French work and its additions, the German medicine book was only published on June 17, 1890, so that five years have not passed before it has been found necessary to bring it somewhat up to date. The additions and alterations are contained in thirty-two pages, less than one-third the space occupied by the extension of the Codex, and they are generally of a very different character to those that have found favour in the neighbouring republic.

Of the fifteen novelties the first is camphoric acid in colourless crystals or white powder (m. p. 178° – 180°), and this is followed by hydrobromic acid (s. g. 1.208). Aqua cresolica consists of one part of cresol soap solution to nine parts of water, and contains five per cent. of crude cresol. Bismuth subsalicylate is added. Then follow cereoli (*wundstübchen*), a sort of flexible medicated bougie. These were originally made of linen dipped in melted wax and rolled. Anthrophores are similar, but contain a spiral spring. Caffeine sodio-benzoate is described as a white amorphous powder (maximum dose, 1 Gm., not to exceed 3 Gm., daily). Other additions are crude cresol; 35 per cent. solution of formic aldehyde (s. g. 1.079–1.081); cresol soap solution (crude cresol, 1, potash soap, 1); lithium salicylate; corrosive sublimate pastilles (1 or 2 Gm. each, composed of equal parts of mercuric and sodium chlorides, coloured with aniline red); creosote pills (creosote, 10, liquorice powder, 19, glycerin, 1); theobromine sodio-salicylate (*diuretin*, maximum dose 1 Gm., not to exceed 8 Gm., daily); tincture of aloes (aloës, 1, strong spirit, 5); cantharides ointment for veterinary purposes (cantharides, 2, olive oil, 4, yellow wax, 1, turpentine, 2, euphorbium, 1); and a new reagent—rosolic acid (1 per cent.).

The alterations are more numerous than the additions: they consist chiefly in the addition of new tests, modification of doses, etc. They affect purified wood vinegar (5 per cent. acetic acid); benzoic, carbolic (liq.), citric, and tannic acids; lard; ethyl bromide; bitter almond water (s. g. raised to 0.970–0.980); balsam copaiba (ammonia test introduced); frangula bark (not to be used until a year after it is purchased—*nach dem Einkaufe*); fluid extracts of condurango, frangula, and hydrastis; citrate, saccharated carbonate, saccharated oxide, sulphate, and dried sulphate of iron; ferrum pulveratum and reductum; glycerin; hyoscine hydrobromide (renamed scopolamine hydrobromide); iodine (dose reduced to 0.02 Gm., daily maximum 0.1 Gm.); solution of acetate, now subacetate, of iron; solution

of arsenic with potassium carbonate (FOWLER'S solution, uncoloured); aloes and iron pills; suet; sulphonal (dose reduced to half, now 2 Gm., and not to exceed 4 Gm. daily); wine, and pepsin wine (time of maceration reduced from eight days to twenty-four hours).

THE BRITISH PHARMACOPEIA.

It is satisfactory to find that at last a useful paper has appeared in the series on the revision of the Pharmacopœia, published in the *British Medical Journal*. Dr. WHITLA, whose paper is reprinted in the present issue of this Journal (see p. 775), approaches the subject in a manner which proves his familiarity with it, and his knowledge of actual needs. He also appears to have grasped the distinction between the relation of pharmacists and medical practitioners, respectively, to the Pharmacopœia, and it is interesting to note that it is his opinion that only by having a medical editor to collaborate with a pharmaceutical editor "can a pharmacopœia be brought out which will index the medical mind of the nation or be creditable to British medicine," as well as a representation of the advanced pharmacy and therapeutics of the day. An excellent paper on the revision of the B. P. from the pharmaceutical point of view, by Mr. W. A. H. NAYLOR, will be found at p. 774. It may be stated that this was in type before certain of the suggestions contained in it were, in a measure, anticipated by other correspondents.

LEAD IN WATER.

At a meeting of the Yorkshire Branch of the Incorporated Society of Medical Officers of Health, on February 14, a discussion on the presence of lead in potable waters was introduced by a paper read by Dr. KAYE of Huddersfield, who argued that all soft water should be regarded with suspicion. He thought the action of water on lead was a complex one, though the presence of acid was probably one cause of such action. Dr. GARRETT of Cheltenham, credited free oxygen with the effect produced on lead pipes, and recommended calcium carbonate in preference to the sodium salt as a preventive. Dr. JOHN BROWN of Bacup, was of opinion that alkalies, except in the form of carbonate, would not prevent solution of lead, and suggested that the stocking of reservoirs with fish was beneficial. Dr. SCATTERY, of Keighley, was convinced that peaty matter was a manufactory of acidity, and that unless the acid thus formed was neutralised, the water containing it was bound to act upon lead. Dr. WHITELEGGE, Medical Officer of Health to the West Riding County Council, preferred soda to lime as an antacid, but thought lead service pipes should be prohibited in the future. Finally a resolution was adopted to the effect "that, as regards moorland water supplies, it should be the duty of vending bodies to satisfy the Local Government Board, either that lead pipes would not be used, or that adequate and proper means would be provided and maintained to deprive the water of any dangerous plumbo-solvent qualities."

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, March 6, 1895.

Present—

MR. MICHAEL CARTWIGHE, PRESIDENT,
MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT,
Messrs. Allen, Atkins, Gostling, Grose, Harrison,
Hills, Martin, Martindale, Newsholme, Southall,
Warren, and Young.

The minutes of the last Council meeting were read and confirmed.

THE LATE MR. BURROUGHS.

The PRESIDENT read a letter which had been received from Mrs. Burroughs acknowledging the letter of sympathy from the Council on the death of Mr. S. M. Burroughs.

ELECTION OF MEMBERS.

Pharmaceutical Chemists.

The following having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Athey, George Hedley Rothbury.
Butler, Ernest Charles Stamford Hill.
Elder, Alexander Cork.
Peach, Charles William Finsbury Park.

Chemists and Druggists.

The following who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Johnson, Francis Prestwich.
Pottage, John Cooper Edinburgh.

ELECTION OF ASSOCIATES IN BUSINESS.

The following having passed the Minor examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Ashfield, Percy John Crewe.
Barker, Robert Henry Windermere.
Boyce, Herbert George Forest Gate.
Brindle, Edward Edinburgh.
Campkin, Bernhard Sidney Cambridge.
Dick, James Edinburgh.
Fraser, Alexander Paisley.
Hartland, Charles Redditch.
Herbert, Henry William Egham.
King, James Coatbridge.
Lees, James Nall Sandbach.
Mitchell, Donald Inverness.
Morgan, Ebenezer Enfield.
Pratt, George Joseph Ilkerton.
Sanders, Ernest Manchester.
Watson, David Glasgow.
Williams, Hugh Francis Llanfyllin.

ELECTION OF ASSOCIATES.

The following having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Armitage, Thomas New Shildon.

Cook, Robert Thornhill.
Lengden, Alfred Cheltenham.
Roberts, Edward Orchard Truro.
Stoddart, Thomas Todmorden.
Tate, Anthony Durham.

ELECTION OF STUDENTS.

The following having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Adams, Ernest Charles Salford.
Atterbury, William Richard Hampton.
Beresford, Arthur William Birmingham.
Boothroyd, Frederick Huddersfield.
Chapman, James Bathgate.
Cornfoot, Thomas Boots Faversham.
Goodall, Frederic Charles Congleton.
Goshawk, Alick Henry Cheltenham.
Gowland, George Newcastle-on-Tyne.
Gray, Clement Cambridge.
Green, Frederick Charles Havant.
Greenwood, Frederic Skegness.
Harrison, Sarah S. London.
Herbert, Alfred Walter Barton-on-Humber.
Howard, John E. Grays.
Hurst, James Vernon Birmingham.
James, Frederick London.
Johnson, Frank Horace Birmingham.
Jones, Morgan Richard London.
Kinder, John Henry Manchester.
Lawrence, Edmund William Knarborough.
Lewis, Walter John Leicester.
McDonald, David Baird Glasgow.
Manfull, Frank Nottingham.
Morgan, David Llanawel.
Morris, John Willington Quay.
Newey, Walter Stechford.
Normansell, John William Stockport.
Pretty, Clement John Robert Rye.
Robinson, John Newton Stockton-on-Tees.
Sellers, William Ernest Nafferton.
Stratton, John Fountaine Barton Bendish.
Todd, Arthur H. Belfast.
Todd, John Cockermouth.
Ward, Wm. Henry Chancewell London.
Whittaker, Charles Edwin Manchester.
Wickens, Thos. Isaac James Southsea.
Williams, Joseph Miles Blaina.
Wilson, John Mitchell Irvine.
Wood, Edward Vivian Manchester.
Woolcock, W. James Uglow Newport.
Wright, Ralph Prudhoe.

RESTORATIONS TO THE REGISTER.

The names of the following persons, who had made the required declarations and paid a fine of one guinea, were restored to the Register of Chemists and Druggists:—

John Westmacott Bedes, Lenham, Kent.
Edward Kent, 20, Royal Exchange, E.C.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

REPORT OF FINANCE COMMITTEE.

The SECRETARY read the report of this Committee, which recommended various accounts for payment.
The PRESIDENT (as Chairman of the Committee)

moved the adoption of the report and recommendations. The receipts on the General Fund account had been very small, but a good sum would be coming in shortly, the greater part of the subscriptions being usually paid in March and April. With reference to the payments, the only one to which he need call attention was £1000 to be placed to the credit of the Chairman of the Executive of the North British Branch, with a view to winding up the accounts for building and fitting up the new examination hall and laboratories in Edinburgh. Speaking roundly, the commission to the architect, the payment of the clerk of works, the introduction of a dado, and sundry other matters, such as the fittings for the electric light, substantially involved additions to the original estimate of between £400 and £500, and the remainder was for detailed work in connection with the examinations, including special fittings, scientific apparatus, materials, etc. Practically it might be said that £2500 had been expended on capital account, and £500 on apparatus and materials more or less consumable. A full statement would be presented later on, but the Committee had seen most of the details, and he did not think there had been any extravagance. It was always difficult to know exactly beforehand what such things would cost, and, as often happened, the plans had been somewhat improved as the work went on, with, of course, some additional expense. On the Benevolent Fund account several donations had been received, viz., from Major Probyn, £50; from Mr. Trickey, Eastbourne, 5 guineas, and from Mr. G. Richards, Hastings, 10 guineas, making £65 15s. in all.

The report and recommendations were unanimously adopted.

BENEVOLENT FUND COMMITTEE.

The report of this Committee notified investigation into three applications for relief. As to two of these it was recommended that they be not entertained, and with regard to the third, the Secretary was instructed to obtain further information.

The VICE-PRESIDENT (as Chairman of the Committee) formally moved the adoption of this report without comment, and it was agreed to.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received including the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
January	{ Day . .	449	27	3	17
	{ Evening .	140	11	3	6

	Circulation of Books.	Total.	Town.	Country.	Carriage paid.
January	. .	223	114	109	£1 9s. 10½d.

Donations to the Library had been announced (*Pharm. Journ.*, February 16, p. 697), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

Museum.

The report of the Curator had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
January	{ Morning	475	27	6	18
	{ Evening	50	7	1	2

Donations to the Museum had been received (*Pharm. Journ.*, February 16, p. 697), and the Committee had recommended that the usual letters of thanks be sent to the respective donors.

This Committee recommended the insurance of the Society's premises in Scotland against fire for £4000; £3000 in respect of the buildings and £1000 on the contents. It also recommended a grant of £25 to the Sheffield Pharmaceutical and Chemical Society, but was unable to recommend compliance with the request of the Inverness Chemists' Assistants' Association for a grant.

The PRESIDENT, in moving the reception and adoption of this report, said it was not necessary to call attention to the formal business, or to the consideration of the assurance of the new premises in Scotland. As to the application adjourned from a previous meeting to consider an application for a grant to the Sheffield Society, that Society was engaged in a scheme of education which had not been quite so successful during the last year. The Committee, after careful consideration, and having had the advantage of the presence of Mr. Newsholme to give it information, had unanimously recommended a grant not of £50 but of £25, on the principle that probably local contributions might be forthcoming to make it up to the larger amount. The Inverness application could not be entertained, it being altogether informal and not coming within the scope of the Society's regulations.

THE ANNUAL REPORT.

The preparation of the Annual Report was referred to the Library, House, and School Committee.

THE ANNUAL MEETING.

It was resolved that the Annual Meeting be held on Wednesday, May 22.

THE WEIGHTS AND MEASURES ACT AMENDMENT BILL.

The PRESIDENT said he had received a letter from Mr. Umney suggesting that as this Bill, introduced by the London Chamber of Commerce, had now been referred to a Select Committee, of which Sir Henry Roscoe was Chairman, application should be made for permission to give evidence from a pharmaceutical point of view. He had already been authorised to take such steps as might appear desirable for securing the passing of the Bill, and he would now move that the President and Mr. Martindale be appointed to give evidence on behalf of the Council on obtaining permission to do so.

The resolution was at once agreed to.

DEATH OF CORRESPONDING MEMBERS.

The PRESIDENT announced that two of the corresponding members of the Society had died during the past month, viz., Mr. Andrew Ferrein, chemist to the

Government Medical Department at Moscow; and Mr. Jean Edouard Bommer, Curator of the Botanical Gardens at Brussels. Both gentlemen were distinguished in their respective lines of work, and it was only right that some reference should be made to their loss on the minutes of the Society.

LOCAL SECRETARY.

Mr. Wm. Gregory, of Weymouth, was appointed Local Secretary for that town.

The PRESIDENT said it sometimes happened that the Registrar, on behalf of the Society, had to make proof of debts owing to it, and the solicitors advised that for that purpose it was necessary that a special resolution should be passed, and sealed with the corporate seal, giving him authority to do so. He therefore moved a resolution to this effect.

This was seconded and carried unanimously.

THE LAW AND PARLIAMENTARY COMMITTEE.

The SECRETARY read the minutes of this Committee, which had held two meetings, and had recommended that no Bill be introduced in the present session.

The PRESIDENT moved that the report be received and adopted. He was sorry to say that it had become necessary to report somewhat definitely in consequence of the state of public business in Parliament. They were all anxious to do certain things; they had promised their members to consider certain things—the question of the consolidation of the Society, the admission to membership of associates in business, the curriculum, the question of companies trading, and various other things were all under consideration waiting to be brought forward at a convenient time. He must say, speaking for the Committee, that after giving the whole subject full consideration, it was felt to be hopeless to move during the current session but the Committee in nowise forgot their obligations to the many active associates in business who were doing such excellent work throughout the country.

Mr. MARTINDALE seconded the motion.

Mr. HARRISON said he regretted that he was not able to be present at the meeting of the Committee, and still more that it had been found necessary to come to the decision just reported. It would be idle to close one's eyes to the difficulties which exist, and even if an attempt were made to go forward he was not quite sure that it would be practicable; probably such a heroic effort would only end in smoke. At the same time he very strongly objected to an indefinite postponement of the matter. Though the Committee might be perfectly right in its decision, it would not, in his view, be right to postpone the further consideration of the question until the eve of another session; and he thought an early opportunity should be taken of formulating a scheme embodying what was generally demanded. It might then be issued to the members in time for them to consider at their autumn meetings what the Committee had been thinking over, with a view to the formation of a healthy public opinion on the matter, and creating some amount of enthusiasm in respect to it, so that when the Bill was introduced it might have some chance of

success. He should like the Committee to meet again at an early date and formulate a scheme, or the same difficulty would occur again, besides, as the years went by it was evident Parliament became more and more impotent to discharge its duties. If he were re-elected on the Council he should certainly bring the matter forward again with a view, at any rate, to the consideration of the three C's—curriculum, consolidation, and company trading; but he agreed that for the present they must await a more convenient opportunity of introducing the Bill.

Mr. MARTIN also regretted his unavoidable absence from the last meeting of the Committee, and agreed with Mr. Harrison that while the decision arrived at appeared to be inevitable, the idea of formulating a scheme ought not to be abandoned. There were many things which ought to be done, but at present the ideas of most people were in a somewhat nebulous condition, and he thought it was the duty of the Committee to endeavour to crystallise those ideas in the form of a Bill, whether there were any immediate prospect of introducing it or not, so that at any rate the members of their own body might be educated as to what the Council thought necessary, and if a general Parliamentary election took place during the year there might be some opportunity also of educating prospective members of Parliament. It was no use going to a candidate and saying you wanted something done, unless they were all fairly agreed on what they should ask for.

Mr. ATKINS thought the Committee had acted very prudently. It might be desirable that the idea Mr. Harrison had thrown out should be adopted, and that the trade at large should be called upon to criticise some definite scheme and make suggestions, but he should certainly deprecate the launching of a Bill without any immediate and definite prospect of its being introduced. The members got rather chary of being worried on these matters unless there was some definite action in view. He spoke from some experience in the matter, and he did hope that no move would be made until there was some prospect of something being done.

Mr. SOUTHALL agreed very much with Mr. Harrison's views, and expected from his remarks that he was going to conclude by moving that the Committee be instructed to prepare a Bill so that the members of the trade might be educated. A great many meetings were held from time to time in the country, and very often there was very little to discuss; but if a Bill were framed it could be discussed, and would give an opportunity for finding out what people really wanted. The three C's which had been mentioned might all be usefully discussed, and though it was no use attempting at present to educate members of Parliament, the education of their own members was another matter, and he thought everything was to be gained by taking them into the confidence of the Council.

The resolution for the adoption of the report was then agreed to.

The PRESIDENT reported the receipt from Mr. Randall, Secretary of the Colonial Pharmaceutical Board

of Cape Town, of a copy of the "Pharmaceutical Register" of Cape Colony.

RESEARCH COMMITTEE.

A special report of this Committee was referred to the General Purposes Committee for consideration and report.

GENERAL PURPOSES COMMITTEE.

The report of this Committee was read and considered in Committee.

On resuming, the report and recommendations were unanimously adopted, and a special resolution passed authorising the Registrar to take proceedings against the persons named.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting held on Thursday, February 21, the following paper was read:—

DIATOMS.

BY F. RANSOM.

(Concluded from p. 784.)

Diatoms present an endless variety in form and structure. The Navicula, or boat-shaped genus, is one of the most common, and may be regarded as the type of the unattached varieties. It contains many species, but all are characterised by being somewhat pointed at each extremity and broader at the centre. Others are linear, oval, wedge-shaped, triangular, circular, etc., and the markings present an infinite variety of designs often of exquisite delicacy and beauty. These markings on the valves have received a large amount of careful examination, and many points respecting their structure have been explained. They have afforded material for long and patient research, and many theories have been suggested to explain their appearance. It would appear, however, that they are due to various forms of depressions and inequalities in the siliceous valve and that no general theory can be applied to every case. It is usually found that the striae or lines which are at first visible, are converted under higher magnification into rows of beads or perforations. Some interesting phenomena which might at first be supposed to throw some light on the construction of the diatom valve were investigated by Schultze with this object. As is well known, the addition of sulphuric acid to a mixture of powdered fluor spar and sand causes the evolution of the colourless gas, silicon-tetrafluoride, which on coming into contact with aqueous vapour deposits silica in a very finely divided condition. On examining this deposit under the microscope it is found to consist of thin walled vesicles of various forms and sizes. The exterior of many of these exhibit markings very similar to those which are seen on the valves of many common diatoms. The results of Schultze's investigations, however, tended to show that the differences were greater than at first appeared, and he concludes that notwithstanding the apparent similarity the sculpturings of diatom valves and siliceous pellicles are in reality due to wholly different conditions.

The habitats of diatoms form a subject of much interest. Roughly, they may be divided into three classes, according to the water in which they are found. Firstly, there are the fresh-water species, including all those which exist in rivers, ponds or ditches, and, indeed, in any situation to which the sea has no access; secondly, the marine; and, lastly, a much smaller class which holds an intermediate position, and is found only in the brackish water of swamps and dykes, to which the sea has occasional access. Although species can be thus described as marine, fresh-water, or brackish, most of the common genera cannot be so distinguished, being abundantly represented both in sea and river.

In connection with the distribution of diatoms a remarkable feature is the great area over which most of the commoner species are to be met with. Brun remarks that he has found in Switzerland almost all those that have been recorded in Saxony, Austria, Central France, and the neighbourhood of Paris. The same might be said of Britain, whose recorded species include the great majority of those of Switzerland. I have collected specimens from the streams of the Pyrenees, the Alps and the Riviera, and find nearly all to be recorded as British, and many to be common around London. The usual explanation suggested for their cosmopolitan nature is that in a dry state they are conveyed by the wind for long distances.

The size of fully-developed specimens varies greatly. Amongst the larger forms of British varieties some of the *Synedra* attain to the greatest length, *S. crystallina*, a marine form, is mentioned by Smith as measuring rather over 1/40th inch. On the other hand, various species of *Achnanthisidium* are frequently found to be only about 1/2500th inch in length. These dimensions refer, of course, to the single frustule; in those species in which the frustules remain attached to each other filaments are frequently found of considerable length. In order to convey an idea of the extreme minuteness of some varieties Ehrenberg calculated that a space of a cubic inch could contain 40,000,000 specimens. He was probably unacquainted with the smallest forms, as the same space would contain over 3,000,000,000 frustules of *Achnanthisidium*.

Many diatoms possess a remarkable power of enduring great variations of temperature without injury, and of existing under conditions which are usually fatal to plant life. Brun relates that he has found living specimens in the melting snow of the high Alps, and it is known that they exist for months on dry rocks exposed to the heat of the sun. Under such circumstances all vital action is suspended, but as soon as the conditions are rendered favourable by the action of rain or sun the usual functions of life recommence, and no injury appears to have been sustained. Extraordinary cases have been reported by various observers of the power of diatoms to revive after being kept dry for a long period. Habirshaw mentions a case of resuscitation after being kept without water for six years. I have moistened specimens of *Synedra* dried about four years previously, but could obtain no definite signs of life, although the colour of the endochrome was to some extent restored.

One of the most interesting phenomena connected with the natural history of diatoms is the power that many possess of independent movement, a fact already alluded to as a source of error to those observers who have classed them as animals. Various theories have been suggested to explain the method and nature of this motion, but nearly all come under one of the three following heads—firstly, the existence of endosmotic and exosmotic currents; secondly, the presence of cilia on some part of the frustule; and, thirdly, the action of some exterior or protruding protoplasm. The hypothesis that the movements are caused by osmotic currents, originated by Nägeli in 1849, was for some time the most generally accepted theory. That such currents do exist is to be expected, but that they are sufficiently powerful and varied to account for these propulsions is scarcely probable. The movements are described by the Rev. William Smith, who inclined towards the osmotic theory, in his 'Synopsis of British Diatomaceæ' as follows:—"This motion is of a peculiar kind, being generally a series of jerks, producing a rectilinear movement in one direction, and a return, upon nearly the same path, after a few moments' pause, by another series of isochronal impulses. The movement is evidently of a mechanical nature, produced by the operation of a force not depending upon the volition of the living organisms. An obstacle in the path is not avoided, but pushed aside; or, if it be sufficient to avert the onward course of the frustule, the latter is detained for a time equal to that which it would have occupied in its forward progression, and then retires from the impediment as if it had accomplished its full course." This is an accurate description of many of these movements, but the jerks are often absent, and it is frequently seen that considerable digressions are made from the rectilinear course without any apparent obstacle being encountered. It is also observable that the direction is to some extent mechanically regulated by the shape of the frustule as in the crescent-shaped *Cymbella*, whose course usually describes an arc of a circle. I have kept an active specimen of *Pleurosigma* under observation during a series of ten journeys, and found that they varied in time from sixty-two to a hundred seconds. Dr. Carpenter, in the sixth edition of his standard work 'The Microscope,' while stating that the cause is still obscure, appears to favour the osmotic theory, and endeavours to dispel the objection that such motion is not observable in other unicellular organisms by saying that there are no other such organisms which are so nearly surrounded by an impermeable envelope, and consequently in which osmose is limited to so small a portion of the cell-wall. A serious objection both to the osmotic and ciliary theories is that contact with some foreign body appears to aid, if not indeed to be essential, to all the movements. If either of these theories were correct, it might be supposed that such contact would be an obstruction rather than an assistance.

The ciliary theory has now been generally discarded, although it has occasional revivals which create some sensation at the time of their appearance. The idea was first suggested by Ehrenberg from observations

made on *Suriella gemma*, a common marine form, from the shell of which he maintained that long delicate threads projected, which the "creature" voluntarily drew in or extended. Thread-like processes, consisting of fungoid growth or parasitic Algae are not unfrequently met with, similar to those described, but that they have any connection with the movement of the frustule, beyond a tendency to decrease its speed, is not at all probable. A rather novel modification of the ciliary theory appeared in the *American Monthly Microscopical Journal*, for 1883, where a writer suggests that the cilia exist within the frustule and act against the current of water passing through.

The third hypothesis takes into account the presence of protoplasmic material exterior to the siliceous envelope, and has of late had many supporters, who, however, differ greatly in respect to details. Schultze, in an early contribution in support of this theory, considered that the interior protoplasm is protruded through the minute apertures of the valves, when it forms a sort of moving band, which, passing along the exterior of the shell, comes in contact with some solid body, and thus forces the diatom in the opposite direction. Professor Ray Lankester, referring to Schultze's paper, describes it as "ending in a satisfactory and conclusive explanation of the method and nature of locomotion in these organisms." A later writer, Anderdank, describes what he calls a "mobile pallium," which partially surrounds the frustule and imparts motion to it. That the final explanation will be found in connection with some protoplasmic material exterior to the shell is not improbable, but there seems no immediate prospect of a complete solution of the interesting problem.

Although the motion of diatoms is slow compared with that of many of the animal organisms with which they are found, it is not insignificant if regarded in relation to their size. The most rapid in movement is *Bacillaria paxillosa*, which Smith found to travel at the rate of about an inch in three minutes. Unlike most species with motile power, these diatoms do not consist of detached frustules, but a number of cells remain connected by the membranous covering. When first observed they may be arranged compactly side by side, then suddenly they extend into a long line, the frustules being attached only by the opposite alternate corners. The sudden transformation is a most interesting sight, and quite unlike the slow movements of other species. This diatom is usually met with in brackish water; I have found it in the ditches of marshy land near Pitsea, which forms a happy hunting ground for the collector, and yields a variety of interesting forms.

Another subject of interest in connection with the natural history of diatoms is that relating to their means of multiplication. The simplest and most common method is self-division, corresponding with the ordinary cell-division as seen in all forms of plant life. The first step of the process appears to consist in the division of the nucleus of the protoplasm. This is soon followed by a growth of cellulose and the development of two fresh siliceous valves, similar in structure to those of the original

frustule, and growing opposite to each in the interior of the cell. As soon as these new valves are fully formed the frustule, if that of a free species, splits from end to end, and two diatoms result, each possessing one of the original and one of the newly formed valves. Under favourable conditions this process of self-division is estimated by Smith to occur once in about twenty-four hours. Assuming this to be correct, a simple calculation will show that in a month a single frustule might increase to about 1,000,000,000. A very rapid development of diatoms may often be observed in a puddle of rain-water which has remained undisturbed for a few days. As in many other lower forms of life, it appears that after a certain period, or after a certain number of subdivisions, this power of cell-division becomes exhausted, and Nature resorts to fresh means of continuing the species. A process of reproduction now takes place resulting from the conjugation of two frustules. The details of the process vary much in different species, but in each case the endochrome and protoplasmic contents of two frustules become united. This results in the formation of one or occasionally two auxospores, and from these a new generation is formed capable of multiplying by subdivision. Occasionally a similar result is obtained without conjugation by the enlargement of a single frustule.

In estimating the results produced by diatoms in the economy of Nature, we find that the imperishable character of the siliceous valves plays an important part. In most parts of the world where search has been made large deposits of so-called fossil diatoms have been discovered. Whether fossil is a correct term to apply to these remains when, as is frequently the case, they exist in a condition almost the same as when originally formed, is perhaps open to question. Occasional specimens are met with in recent geological strata, and they have been found to be present in the London clay, where a few species new to Britain were detected. Deposits of almost pure diatoms exist in the beds of several small lakes in North Wales, Scotland, and Ireland. In Norway and Sweden a remarkable use is made of deposits of this description, which are termed *berg-mehl* or mountain-flour. In bad times it is the custom of the peasants to mix this material with their dough in making bread, the idea being that it increases the nourishment. One of the best known and most remarkable diatomaceous deposits is in Virginia, where the city of Richmond is actually built upon a stratum, varying from eight to thirty feet in thickness, consisting almost entirely of the valves of marine diatoms of past ages. Another interesting source is guano, where we find that these indestructible shells have passed uninjured through the bodies of sea-birds. Some new species were discovered in the stomachs of Japanese tinned oysters exhibited at the Fisheries Exhibition in London in 1883.

Diatomaceous earth is much used for polishing hard surfaces, a well-known deposit in Austria being of special value for this purpose. Owing to the extreme minuteness of the valves a similar material has been used in the manufacture of dynamite, as affording

silica in a finely divided condition. A variety of this earth, known as *kieselguhr*, has been employed with success in the pharmaceutical process of filtration. The clarification of cloudy liquids may be assisted by the addition in the filter of a small quantity of powdered *kieselguhr*, and the filtration of comparatively thick liquids is often quickened by the same means. Besides these uses a most valuable service has been rendered by certain diatoms in providing tests for the quality of object-glasses. The lines or striae, which occur on the siliceous valves vary only to so small an extent on the same form that they may be employed as a standard. The number of these lines which can be resolved in a given space indicates with approximate accuracy the angular aperture of the objective, and hence its power of exhibiting detail may be correctly measured. *Amphipleura pellucida*, a species found in Britain, is largely employed as a test for this purpose.

A rather novel use was made of diatoms some years ago by Dr. Bossey, described in a paper entitled "Thames Mud in Relation to Sanitary Science." It is well known that large deposits of mud have been formed at various times in the Thames in the neighbourhood of Chelsea and elsewhere, and it became an important matter to determine whether these accumulations had any connection with the sewage matter discharged into the river lower down. With the view of obtaining some reliable information on this point, the diatomaceous forms from a number of these deposits were examined, with the result of finding numerous specimens of marine species even so high up as at Richmond. This indicated the power that the tide possesses of conveying solid materials far up the river, and suggested the probability that sewage matter may have had some connection with the formation of these banks.

Finally, I think we may claim that diatoms are of use from an educational point of view. The study of these minute forms of life cannot but stimulate those powers of accurate observation which are so essential to the success and enjoyment of life. The mounting of the valves as microscopic objects affords exceptional opportunities for the exercise of manipulative skill. Problems in connection with their power of movement, their reproduction, and the delicate markings of their frustules still remain unsolved, and offer to observers a promising field for further research.

In conclusion I desire to express my thanks to Mr. F. W. Phillips, F.L.S., for his kindness in lending me the series of illuminated diagrams in illustration of the subject of this paper.

A meeting was held on Thursday, February 28, the President, R. H. Jones, in the chair.

The following papers were read:—

A METHOD OF PREPARING SMALL QUANTITIES OF AROMATIC WATERS.

BY C. E. SAGE.

The author had made experiments to see whether an apparatus could be devised in order to enable pharmacists to prepare their own aromatic waters. The apparatus consists of (1.) a half-gallon tin (one that has been used for oils, etc., which has been

thoroughly cleaned) fitted with a cork in which are two tubes, one a straight tube dipping under the surface of the water and projecting some distance beyond the cork, the other tube bent at right angles and projects only a little way beyond the cork in the can; (ii.) a flask fitted with a cork containing two tubes bent at right angles, one reaching to the bottom of the flask, and the other just within the neck; (iii.) an ordinary condenser and a receiver.

The tin contains the water, which boils vigorously, and the steam passes by the exit tube into the second flask which contains the drug, where part of the steam condenses, and another portion passes over with the volatile constituents of the drug and is condensed in the usual manner. It is found that after a short time "spurting" commences, owing to condensation of the steam in the second flask, accordingly, a trap is used to prevent all solid particles from passing over. In this way one pint of aromatic water could be prepared in an hour, but, when the drug was used, the water was always found to possess a slight empyreumatic odour, and the author therefore suggests the use of the oil in place of the drug. When the oil is used, the second flask need not be so large, and there is no spurting. Samples of waters prepared in this manner were exhibited.

A USEFUL LABORATORY FILTER.

BY ALEX. GUNN.

The filter was originally devised to minimise oxidation, and in this respect proved an unqualified success: it was also found very useful in filtering strong solutions of quinine in phosphoric acid, which went indifferently through flannel or twill, and refused absolutely to go through paper. The whole apparatus is in principle a syphon, the filter itself being simply an alteration in the limb of the syphon, adapted to hold the filtering medium.

The apparatus is constructed as follows:—a glass cylinder is taken about 12 inches long and $1\frac{1}{4}$ inch in diameter. The supply tube, $1\frac{1}{4}$ inch diameter, is connected to the cylinder by a rubber bung, and the exit tube, $\frac{3}{4}$ inch in diameter, is connected in a similar way. It is important that the supply tube should be of wider bore than the exit tube, otherwise the limbs of the syphon will not be full. The filter is charged as follows:—the exit tube having been fitted to the cylinder, a few pieces of clean broken glass are inserted, then a wad of cotton wool, not tightly packed, to make a layer about $\frac{1}{2}$ inch deep, then a little glass wool and more cotton wool as before, glass wool again, and then a layer of paper pulp.

The central space of the cylinder is filled with eight or nine small clean glass stoppers (ounce phial size), or glass beads if preferred. This prevents too much compression of the different layers. Paper-pulp is added next to form a layer 1 inch deep, solid but not tightly packed, a little glass wool over this, then another layer of paper-pulp, and finally a little more glass wool, and if there is room a pad of cotton wool. It is possible by using the arrangement described to filter 26 or 27 gallons in a night without any loss, but care must be taken that the

receiving vessel is of sufficient capacity to contain the whole of the filtered liquid or disaster will ensue.

The following are some of the advantages in favour of the filter. Exposure to the atmosphere is reduced to a minimum; heavy sediments can be avoided by raising the limb of the syphon and so preventing clogging; there is no disturbance of the filter by addition of more liquid. It is self-feeding, and with suitable vessels requires no attention when once started; consequently filtration may proceed over-night, and the filter may be filled with any suitable material, such as charcoal, kieselguhr, etc., and can be easily changed or cleaned when necessary. Lastly, there is no waste of liquid.

The filter described bears a striking resemblance to a percolator described in a paper read before last year's British Pharmaceutical Conference, but the filter was in almost daily use in June of the same year, and this fact disposes of any charge of plagiarism that might be made.

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

A general meeting was held at the Royal Institution on Thursday, February 28, Mr. Jno. Smith, President, in the chair. There was a large attendance of members, many of whom were attracted by the announcement that Professor Carter, in the course of his remarks upon "Argon," would exhibit the lines in the spectrum by the spectroscope. Owing, however, to an accident to the tube of argon, this was prevented. Dr. Carter read a series of letters from one who has assisted Lord Rayleigh in his researches, which explained in considerable detail the progress of the investigation step by step.

The following papers were then read:—

NATURE'S POLYPHARMACY.

BY WILLIAM CARTER, M.D., B.Sc., LL.B. LOND., ETC.
Professor of Materia Medica and Therapeutics, University College, Liverpool; Physician to the Liverpool Royal Southern Hospital.

As a not unnatural reaction from the great complexity of the older medicinal formulae, there has been of late years an increasing tendency in the direction of what is termed simplicity in prescribing, till at length some physicians appear to shrink from ordering at any time more than one drug, lest they should be considered to sin against reason and nature; while in the practice of a very few medication has reached the vanishing point, and, rather than run the risk of polypharmacy, these prefer to have no pharmacy at all.

Extremes are always to be avoided. In this, as in every other department of knowledge where experience comes into operation at all, it affords the safest guide for action, and an increasing knowledge of the constitution of many of our old-established and best approved remedies proves that on that safe ground some degree of polypharmacy is justifiable, while a growing acquaintance with the great complexity of the chemical and physiological processes going on in the human body justifies it on the higher but less easily secured ground of scientific reason.

The constitution, chemical and physiological, of even the simplest unicellular organism—if it is not a misnomer to apply the term organism to that which seems to have no organs—is so complete that it is not possible to say, except as the result of experiment, how even it will react to drugs, while every step upwards in the scale of living beings presents such an increasing complexity, organ being added to organ, each with its distinct secretion and system to system, that at last the mind becomes absolutely bewildered in its attempt to grasp the intricate workings of the whole. Our conceptions on this apparently simple but really most difficult matter of the reactions of our bodies to drugs are coloured by the belief that the personal identity, which makes us feel that morally and intellectually we are the same beings through many succeeding years of life, may be extended so as to embrace our physiological and physical beings as well.

If a man commits a breach of the moral or criminal law to-day, he will be justly amenable to whatever punishment such breach may entail, even if years shall have elapsed since the sin or crime was committed, and he would feel, and justly feel, that he is the very same responsible being in 1905 as he was in 1895; but if because of this just conclusion he thinks that he is so far the same being that he will respond to the same drugs in a similar way at the two periods, he is reasoning foolishly; for it is just possible that a really very great and fundamental change in his entire organism may have taken place in the interval. Not only is he not the same being in this lower sense of the term "being" at any two years of his life, but he is not the same at any two hours; for probably no more unstable or variable piece of mechanism than a civilised man is anywhere to be found in the world. The more highly civilised, or as we are apt to term it the more nervously constituted, he is the more and more unstable is he apt to become.

There is no more sensitive index of the chemical changes which are going on in the human body than the urine, and this is found to vary in composition from day to night, and even from hour to hour. Bouchard in his well-known experiments found that the urine of a healthy man, voided immediately after the usual night's sleep, when injected into the veins of a rabbit, was not only more poisonous than the urine of the same man passed at the end of a hard day's work in the open air, but that it was poisonous in a different way, the predominant symptoms in the first case being convulsivant, but in the second coma-producing. It has even been thought possible that the alternating states of sleeping and waking may possibly be due to the gradual accumulation within the body of products which, acting on the nervous centres differently at one period, viz., night tend to overwhelm the brain with drowsiness, and at another, the morning, to irritate it into wakefulness, and call the sleeper back to life and activity. At any rate, the fact that chemical products have an entirely different effect on the systems of those within whom they are generated, according to the time of the day, makes it easy to understand how it is that a hypnotic always acts best when administered near the time of natural sleep, its effect being

then added to those sleep-producing products formed in the natural laboratory of the body at that period; as well as why it is that convulsive movements will often occur in those liable to them as the time of ordinary waking is drawing near, and gives reason for the practice of doubling the dose of protective medicine the last thing at night.

But what relation have these facts to any facts of drug administration? Why, just this: that so complex and variable a mechanism will probably require a variable and complex treatment when it becomes disordered. The hackneyed rules which should guide the writer of prescriptions in order that the pharmaceutical preparation may act *cito, tuto, et jucunde* (quickly, safely, and pleasantly), generally direct that a medicinal formula may consist of basis, *adjuvans corrigens*, and *constituens*, or the chief substance with which to cure that which assists it, that which corrects any unpleasant effect, and that which serves as its vehicle.

But they do not contemplate anything outside this, and modern ideas would be very much scandalised if a prescriber deliberately and of set purpose placed on paper in the same prescription the names of substances which were directly antagonistic to each other physiologically. He would be reproached for blowing hot and blowing cold at the same time, with being a mere empiric, with departing from the simplicity of science, and much more to the same effect. Yet probably such an objector would be very frequently guilty of the same kind of inconsistency as he criticised in others. For it is a curious and instructive circumstance that many of the great vegetable remedies, the efficacy of which has been established by years or generations of the experience of thoughtful and observant medical men, contain just such antagonistic principles. But a single name being given to the drug, its contradictory and compound nature is not thought of by those who prescribe it.

To a few examples of this kind of natural polypharmacy I desire to draw your attention, and if it can be established, as I believe it can be, that the effects produced by such a combination of opposite principles are good, that they are often much better than when either of the principles is given alone, there will be established a sufficient justification for the action of those who designedly introduce into prescriptions physiological antagonists, mixing them, however, in such proportions that the one shall moderate or control without entirely neutralising the activity of the other.

The first example which I will adduce is that of jaborandi. The leaflets of this drug contain, in addition to a volatile oil, two absolutely antagonistic alkaloids, which, if they existed in such proportions that each could produce an equally powerful thought opposite effect, would exactly neutralise one another and no result would follow. But the jaborine, or atropine-like alkaloid, is in so relatively small a proportion to the pilocarpine that it controls but does not destroy the effect of this latter. That it does control that effect is quite certain, and without any desire

to be singular or to affect a disagreement with those whose opinions are entitled to respect, I cannot help expressing my dissent from not a little of what is said and written concerning this drug. Thus, I find the following statement by a well-known authority: "Jaborandi appears, however, to irritate the stomach, and often causes nausea and vomiting, and so does pilocarpine, though to a less extent, even when subcutaneously injected." My experience, which is large, would compel me to completely reverse the terms of this sentence by putting pilocarpine for jaborandi, and *vice versa*. So uniformly, indeed, did small doses (such, for example, as $\frac{1}{2}$ grain) of pilocarpine nitrate cause vomiting when administered by the stomach that years ago I omitted to employ it in that way, substituting for it jaborandi as tincture or infusion, because it could be generally given without causing emesis. I do not say that jaborandi will never cause sickness, but what I do say is that it causes it very much less frequently than does pilocarpine, and that just as we sometimes designedly introduce a small amount of atropine into our hypodermic dose of morphine, with a view of preventing the nauseating effect of the latter, even though atropine is to a certain extent a physiological antagonist of morphine, so nature in the case of jaborandi has effected the same kind of mixture of opposite alkaloids. I have sometimes had striking illustrations of the correctness of this statement.

In another respect the compound of opposites in this drug are superior to the pure alkaloid, it does not like that single alkaloid depress the heart. In the course of a celebrated criminal trial which took place some years ago in this city, a medico-legal expert, who admitted that he knew next to nothing of medicine as a practical art, expressed the opinion that the smallest official dose of tincture of jaborandi, of which I had advised the administration to relieve a distressing dryness of the mouth, would probably depress the heart; this, however, is just what it will not do, the jaborine and the alcoholic vehicle more than counteracting the depressing effect which pilocarpine alone might cause, either directly or indirectly through provoking sickness; and the admission that he had next to no knowledge of the practical effect of medicines seemed to me to be a perfectly needless one after such a statement.

Let me turn to another great drug in which a similar mixture of antagonistic principles is found. The British Pharmacopœia contains digitalis in three forms, 1, the dried leaf, 2, the tincture, 3, the infusion. Now the leaf contains several distinct principles, of which one—digitonin—is the direct physiological antagonist of the others. These last cause the small arteries, as well as the cardiac ventricles, to contract powerfully, and hence raise the general blood pressure, while the first, if pure, will, like saponin, with which it is nearly identical, cause them to dilate and the blood pressure to fall. But owing to its much greater solubility in water than some of the others, there is a relatively larger proportion of digitonin in the infusion than in the tincture, at least, such is said to be the case, and hence the contracting effect of

digitonin and other principles that resemble it is more controlled and moderated by the infusion than by the tincture. If this is correct, it may help to explain what practical experience seems long previously to have settled, viz., the superiority of the infusion over the tincture in the treatment of aortic regurgitation, in which affection any undue amount of contraction of the smaller arteries would be a great disadvantage. I am quite aware that some object to the use of digitalis in any form in aortic regurgitation, and that diagrams have been constructed to illustrate the manner in which it must do injury in this affection. Practical experience does not, however, support the validity of the objection. Digitalis often proves most useful in this affection.

In the case of digitalis, therefore, as in that of jaborandi, experience has established the fact that the blending of physiological opposites which nature has produced for us, is superior to either of the things blended when given alone; although any such intentional blending on the part of the subscriber would probably be characterised as the worst form of polypharmacy. I must add one word with regard to digitalis. Although I am willing to believe that the infusion may contain relatively more digitonin than the tincture, I am quite sure that a supposed rough proof of this which is often given is no proof at all. It is said that a given quantity of infusion of digitalis will, when shaken, froth more strongly and for a greater length of time than will an equal bulk of water into which has been poured an amount of tincture representing the value of the digitalis contained in the infusion. I can only say that when I have carefully performed this experiment as I have done, the very reverse has been the case. I can only imagine that the statement has gained currency by its having been accepted on the authority of him who first happened to make it without any attempt being made to determine its accuracy.

I will merely allude in passing to the fact that we have in physostigma such physiological opposites as physostigmine and calabarine, yet nobody objects on that account to using the extract.

If, however, we turn to the oldest and best of all the vegetable products of the Pharmacopœia, opium, we find the most conspicuous example anywhere afforded in nature of this most despised, though in the present case most useful, polypharmacy. For besides gum, sugar, and other vegetable products, opium is said to contain no fewer than seventeen or eighteen different alkaloids, two neutral principles, and one peculiar acid, so that a prescriber of this drug, even though he may perhaps be flattering himself that he is conforming strictly with present-day notions of simplicity in pharmacy, is a polypharmacist of the worst and most pronounced type. And not only are the constituents of opium very numerous, but, like the other drugs mentioned, it affords in its thebaine and morphine a further illustration of direct physiological antagonism. Yet every practical physician knows full well that he can often obtain much more satisfactory results from that natural mixture of many principles known under the name of opium

than from any single alkaloid which may be separated from it.

In conclusion, I should like for a moment to direct your attention to an example or two of polypharmacy of a pre-eminently useful character, though much despised by many who have never taken the trouble to prove its worth. Here is a prescription of the late Dr. Graves: R-Pulv. jalapæ, Pulv. rhei, Pulv. scammonii, aa gr. v., Elaterii, gr. iss., Pot. bitart, Pot. sulphatis, aa ʒss., Syr. Zingib., q.s. ut fiat bolus. This Dr. Graves used to treat, and well treat, as he tells us, many dropsical patients. I can fancy the scornful curl of the lip of the very clever young pharmacological student of to-day as he casts his eye over this prescription, in which quick purgatives and slow ones, watery and simple ones, those which require an admixture with bile to ensure their activity, and those which act equally well when injected into the blood, are all jumbled up together and finally massed into a bolus big enough for a horse; and if he happens to be as humane as he is scientific, the contempt for such old-fashioned prescribers as Graves will be blended with pity for the poor people who grew dropsical before the days when a minute powder of elaterinum, perhaps even a minuter pillule, and that pillule a sugared one, as representing what is termed the elegant pharmacy of the present time would cure them *cito, tuto, et jucunde*. If I had the misfortune to be generally dropsical, and could be permitted personally to choose between two methods, I should certainly select the bolus. By that means I should feel sure that a complete evacuation of my intestinal contents, and not a mere watery discharge, would be effected. Whereas, by the other method, I should feel almost as sure that while my small intestines were gradually undergoing contraction, till at length they would scarce be of greater girth than my thumb, my large intestines would be gradually distended by a compact solid fecal residum, which no effort of mine, even if my strength were normal instead of at the lowest ebb, would enable me to evacuate. This is just what I have seen after the elegant method has been followed, but is just what Dr. Graves's prescription was designed and is effectual to prevent.

I will merely mention one other remedy compounded of many drugs which those who do not know its value despise, and which those who do know its value will never consent to be beyond the reach of. Warburg's tincture has formed the subject of many controversies. There was one in 1873, when Professor Maclean published a formula for it, when it was known that quinine, aloes, rhubarb, angelica seeds, saffron, fennel seeds, prepared chalk, gentian root, cubebs, myrrh, and camphor formed only some of the constituents. You may imagine the mirth that was excited in the minds of the scientific scornors.

I will only say that I suppose we, at the Royal Hospital, have the opportunity of acquiring as large a practical acquaintance with the various types of malarial fevers as can be acquired in any hospital in the kingdom.—the Dreadnought, perhaps, alone excepted—and my opinion has long been that in some of the more dreadful of these fevers, such as those termed bilious remittent, where deep jaundice, high temperature,

delirium, hæmorrhage, etc., form such a combination of symptoms as would seem almost to shut out the possibility of hope, life has again and again been saved by the administration of Warburg's tincture, administered in Warburg's manner, and would have been saved by no other means as yet made known to us. I quite admit that the vast majority of such agues as we see in Liverpool do not require it. I do not know which, if any, of the numerous ingredients are useless, and until I do know this, I prefer not to omit any. And, lastly, I am ready to make the unmanly admission that if it ever should be my lot to be the subject of one of those terrible remittents or intermittents to which I have alluded, I should manifest a weak bias towards being cured by Dr. Warburg's polypharmacy rather than being allowed to die according to the strictest rules of nineteenth century scientific pharmacology.

NOTE ON A SAMPLE OF CRYSTALLISED SUGAR.

BY HAROLD WYATT, JUNE.

Some time since I was asked if I could account for some crystallised sugar giving a distinctly blue coloration to milk with which it had been mixed. The sugar was of the ordinary white variety in rather large crystals, and had the appearance of the foreign made sugars produced from beetroot; but when viewed on a white background the crystals were of a more decidedly bluish shade than usual. The smaller particles and dust were full of dark specks easily seen with the naked eye, and on dissolving in water, a deep blue solution was formed. Knowing that it is a usual practice to face loaf sugars with a little smalts or ultramarine blue, I treated the solution with hydrochloric acid, expecting to perceive traces of sulphuretted hydrogen if the smalts blue were the colouring matter employed. The result was that the solution became yellowish, but no odour was produced. It then struck me, bearing in memory a recent case in which so-called Demerara sugar turned out to be a moist sugar coloured with brown aniline dye, that some aniline dye was the colouring matter, so I hung some floss silk in the solution, and in a few days saw by the absorption of the dye by the silk that my opinion was correct. The dye had evidently not been put into the syrup before crystallisation, but had been rubbed down with some of the sugar and then sifted through the crystals, showing that the "improvement" in colour had most likely been made by the broker and not by the manufacturer.

NOTE ON SUPPOSITORIES.

BY HAROLD WYATT, JUNE.

The most tiresome suppositories to make are, as most dispensers readily own, those containing vegetable extracts, requiring as they do such careful manipulations and unremitting attention. The usual mode of procedure consisting in thinning the extract down to a syrupy liquid, and adding this to the melted cacao butter, kept at as low a temperature as possible—is very well when one's attention is not distracted during the process, but the continuous stirring necessitated makes the method,

at its best, somewhat irksome. Whilst in a situation in a French pharmacy I was shown by my worthy "patron" a little "tip" in the manipulation of such suppository masses which has been exceedingly useful to me since, and one indeed which I have extended to suppository masses generally, with the very best results. It is simplicity itself, and resolves itself into the use of a wide-mouthed bottle (fitted with a good cork, or better, an india-rubber stopper) instead of a small capsule or suppository water-bath. The cacao butter is put into this bottle, warmed on a water-bath until liquefied, and then the thinned extract or other medicament added, the whole being shaken vigorously until ready to pour into the moulds. It is easy to get as much as 5 grains of extract into a 15 grain suppository in this way, a thing rather hard to do in the usual fashion.

Reviews and Notices of Books.

ORGANIC CHEMISTRY. By W. H. PERKIN, JUNR., PH.D., F.R.S., and F. STANLEY KIPPING, PH.D., D.SC. (LOND.). Pp. 560. Price 6s. 6d. (W. and R. Chambers, London and Edinburgh.)

During the last few years a number of excellent books on elementary organic chemistry have appeared in which the method of treatment adopted, in most cases, has been to select a few typical compounds for detailed description as illustrations of general principles. The authors of the present work have somewhat extended this excellent plan, without, however, reducing it to a mere catalogue of organic substances. The scope of the book includes such subjects as acetoacetic and malonic ether syntheses, oximes, hydrazones, diazo-compounds and their derivatives. Throughout the whole book constitutional and graphic formulae are freely employed, ample proofs being clearly given. Practical directions are given for carrying out a large number of experiments, the authors rightly insisting upon the importance of the student performing for himself the synthesis, analysis, purification, etc., of typical organic compounds.

Part I., comprising sixteen chapters, and about half the total number of pages, is devoted to the methane derivatives. In the introductory chapters the composition, purification, and analysis of organic bodies are described at considerable length. Then follows a chapter on the deduction of formulae from analytical results and determination of molecular weight, the cryoscopic and other methods being clearly described, and illustrations being given of the apparatus commonly used.

At the end of most of the remaining chapters a summary and extension is given in smaller type, the consideration of which the authors recommend the beginner to defer until he has acquired a general acquaintance with organic chemistry. In the extensions the more complicated reactions are placed, notably in the case of aldehydes, ketones, and carbohydrates.

Part II. consists of nineteen chapters, and embraces the benzene or aromatic compounds. The opening chapter contains an account of the production of coal

tar and the separation of its chief constituents on a commercial scale. The constitution of benzene is treated very fully, the prism, centric, and diagonal formulae all coming in for discussion. Naphthalene, anthracene, phenanthrene, the quinones, pyridine, and quinoline are also selected for detailed treatment.

Chapter XXXIII., dealing with the alkaloids, should be particularly interesting to students of pharmacy. The constitution of the most important ones is described as simply as possible, and a good deal of information in connection with this subject not usually found in an elementary text-book is contained in the chapter. Chapter XXXIV treats of dyes and their application. The dyes are classified and the special character of each class in relation to its practical application to various fabrics is given. Chapter XXXV, on stereo-isomerism, completes the book, which deserves to take a foremost place as a student's text-book in this country. Besides the systematic or theoretical treatment of the subject, the authors have included a large amount of interesting information in connection with the practical application of organic substances in commercial and industrial processes.

Correspondence.

THE BRITISH PHARMACOPEIA.

Sir,—In your issue of February 9, your correspondent "Galen" takes me to task for having used the word "tabloid" in my article in the *British Medical Journal* of February 2, and reprinted in the *Pharmaceutical Journal* of February 9. I regret that I was quite unaware that the word was a registered trade-mark, and, as I found that in 'Martindale's Extra Pharmacopœia,' seventh edition, mention is made at p. 145 of Cocaine Tablets prepared with chocolate, and at p. 148 of Tabloids of Hydrochlorate of Cocaine for hypodermic injection, I imagined in my ignorance that I should indicate the kind of preparation I intended more exactly by the word tabloid than by tablet. I have no desire whatever to foster either quackery or monopoly, and if the General Medical Council will introduce general directions for making up suitable drugs into tablets or tabellæ, your correspondent's troubles will be lessened or removed. But much more serious charges are brought against me in the leading article of your *Journal* of February 23, in which you have done me the honour of noticing my paper, for in it I am said to take up a position which is "very untenable," and am accused of using "arguments which are fallacious in the extreme." I am quite ready to renounce the position I have taken up as soon as it is shown to be untenable, and to throw aside at once any argument that is proved fallacious. But in your article you merely start with the assertions I have quoted, and you bring no evidence in support of them. The title of my paper and the statement in the leading article at p. 267 of the *British Medical Journal* (February 2), that it is the first of a series to be published in that journal dealing with the Pharmacopœia from various points of view, show that my position is not that of a judge summing up the whole question of what the British Pharmacopœia is or is not to be, but that of an advocate presenting one view of the case, viz., that of the prescriber; you bring forward no evidence what-

ever to show that this position is untenable. Acting as the advocate of the prescriber, I state that the *Pharmacopœia* issued by the General Medical Council is intended primarily for medical men. This statement you grant to be correct (p. 711, column 1, last line). You then pass on to consider the relation of the *Pharmacopœia* to pharmacists—a most interesting question, but altogether apart from the subject of my paper. I feel strongly myself, and I have also tried to persuade others that if the British *Pharmacopœia* is to be up to the mark, it can only become so by the help of pharmacists, and I am glad if my paper has afforded evidence in support of this view; but this subject was outside of the scope of my paper, and was, consequently, not touched upon. The reasons I give for the greater popularity with medical men of Squire's 'Companion' and the 'Extra *Pharmacopœia*' than of the British *Pharmacopœia* are that they omit much matter which is not wanted, and that they supply some information which is wanted by the prescribers regarding "the preservation of medicines and different modes of prescribing them in a more or less agreeable form, as well as hints or even fairly full statements about their actions and uses." It must be remembered that the reasons given are for the popularity of the works not amongst pharmacists but amongst medical men. I have given them as the result of inquiries made amongst medical men, as well as of my own experience, and I should be glad to know in what respects they are "not valid." In my paper I acknowledge that the introduction of indications of the actions of medicines into the British *Pharmacopœia* would be an innovation hardly to be hoped for, yet the expressions of opinion I have heard since my paper was printed justify me in the statement I made, that such an innovation "would be warmly welcomed by many a medical man." From the emphatic statement contained in your article, such an innovation would appear to be most unpleasing to pharmacists, and it will be the duty of the General Medical Council to take into consideration the wishes and interests of all those concerned in the new edition of the British *Pharmacopœia*, and decide accordingly. I should not have troubled you with this letter, but I have felt it necessary to defend myself from the charges which you have in your article brought against me of taking up a position which is "very untenable," of bringing forward reasons which are "not valid," and of making use of arguments which are "fallacious in the extreme."

T. LAUDER BRUNTON.

. Though we cannot share Dr. Lauder Brunton's opinion that the British *Pharmacopœia* should be made a compendium of miscellaneous information, we regret that he should, therefore, have felt compelled to defend himself as the advocate of prescribers. If his efforts in that capacity were directed to ensuring a more rational exercise of the art of prescribing than is too frequently met with, we do not doubt that they would be productive of great advantage, not only to prescribers themselves, but also to their patients and to the dispensers of their prescriptions.—[Ed. *Pharm. Journ.*]

THE MAJOR EXAMINATION.

Sir,—Will you kindly allow me space to echo the sentiments of "M.F.C.S." in your last issue, re the passing of the Major examination by instalments, and to thank that gentleman for one of the best suggestions that I have lately seen in your Journal. If the above suggestion is adopted, possibly the Council of the Pharmaceutical Society will be able to make some slight concessions to those who were associates in business before the jubilee of the Society, as a mark of appreciation of their support as

associates. Such an inducement would undoubtedly have the effect of largely increasing the membership of the Society—as there would be very few who, after having belonged to the Society for years, would sever their connection with it after having attained the higher qualification—and possibly induce outsiders to join when they see that the Society does something for those who have remained true to it, and so make the Society a truly representative body.

VERBASCUM.

"SHOULD DOCTORS DISPENSE?"

Sir,—“Omega,” in his letter to you of March 2, writes: “We chemists have not the right to prescribe.” May I ask “Omega” where he has found that piece of law which disqualifies a chemist from enjoying rights common to all citizens of the United Kingdom? I was not aware that I signed away my prospective rights as a citizen when I signed my indentures. The law, as stated by a London stipendiary magistrate, and confirmed by a late Lord Chief Justice of England (Cockburn), was that doctors had no monopoly as to prescribing, anybody might prescribe. I think it would be better to cast aside all the miserable cant and face the matter fairly. Doctors dispense because it pays them well to do so; they thereby secure a fee whenever the patient requires a repetition of the medicine. The chemist prescribes because he cannot secure the prescription. I am surrounded by doctors who dispense their own except during an epidemic such as the present influenza, when they have not the time. There are a few exceptions, and I very carefully avoid prescribing for their patients.

London.

ALPHA.

REVISION OF THE BRITISH PHARMACOPŒIA.

Sir,—In reference to the suggestion of “Devoniensis” (p. 728), to omit the cypher in a few sp. gravities, I would suggest that, in an approximation, as a sp. gravity always must be, the cypher may be a significant figure indicating that the calculation has been carried to the third (or fourth) place with negative result. For instance, 1.06 indicates a value between 1.055 and 1.065; whereas 1.060 only gives latitude between 1.0595 and 1.0605.

Tunbridge Wells.

S. O. REDMAN.

Answers to Correspondents.

“Constant Reader.”—The former explanation is the one usually given, but it is conceivable that the second factor might come into play in some cases.

W. A. Grace.—Thanks for enclosure. The case illustrates several points of interest.

Corrections.—In the report of the Chemical Society's meeting in last week's Journal, the name of Professor MacLeod appeared amongst the auditors instead of the members of Council. On page 762, column 2, line 11, also, the word “reducing” appears instead of “oxidising.”

In Mr. Lunan's paper also, on page 767, column 1, after *acetanilidum* delete the words “up to,” and in column 2, for *Amyl Nitras* read *Argenti Nitras*. Further, on page 769, column 1, line 26, for “shall” read “still.”

COMMUNICATIONS received from Messrs. Buck, Burnett, Christy, Cocks, Dey, Goldby, Grace, Grierson, Harrison, Hick, Hill, Humphreys, Kirkby, Lunan, Lyle, Naylor, Nurraw, Redman, Reynolds, Sage, Simmonds, Smith, Watts.

STANDARDISED PREPARATIONS OF BELLADONNA.

BY R. A. CRIPPS, F.I.C.

The subject of this paper is by no means a new one; several investigators have already carried out valuable work and made suggestions which have been more or less practical.

Messrs. Dunstan and Ransom contributed to the *Ph. J.* [3], vols. xiv., xvi., and xvii., several papers, in which they described accurate processes of assay for the root and leaf, and their alcoholic extracts.

Their results indicated that the alcoholic extract of the root, as met with in commerce, was at that time extremely variable in alkaloidal value, nine samples yielding from 1.65 to 4.45 per cent.—average 2.9 per cent. They strongly advocated the use of the root alone for all preparations of belladonna, the leaf and its extract being much less convenient for assay. They would exhaust the root by means of a mixture of rectified spirit and water in the proportion of four to one by measure, assay the resulting tincture, evaporate to dryness, and add sufficient sugar of milk to bring the whole to the strength of 2 per cent. alkaloids, finally reducing to powder. From this the liniment and tincture could be prepared by solution in spirit of the same strength (4 to 1) in such proportions as to contain 0.2 and 0.034 part in 100 fluid parts respectively.

Ransom (*Ph. J.* [3], vol. xvii., p. 257), found samples of liniment to contain from 0.067 to 0.274 part of alkaloids in 100 fluid parts, average 0.19 per cent.

Cowie (*Ph. J.* [3], vol. xxi., p. 631) records the assay of six commercial samples of the root extract, which showed a range from 1.6 to 4.0 per cent.—average 3.2 per cent.; moreover, he suggests 4.0 per cent. as a "standard."

J. Barclay (*Ph. J.* [3], vol. xxiii., p. 740), in a very valuable contribution to the subject, advocates a "standard" of 3.0 per cent. for the alcoholic extract, which he would prepare by first percolating the root with rectified spirit, then with a mixture of equal parts of rectified spirit and water, evaporating each to an extract, assaying separately and mixing in correct proportions. The remainder of the weak extract he suggests should be raised to the strength of 1 per cent. alkaloids by addition of the strong extract *q.s.*, and this might replace the present official extract. The liniment and tincture he would make to contain 0.25 and 0.025 part in 100 fluid parts respectively. His paper contains a useful table of results obtained by analysis of the root—twenty-three samples, extending over a period of five years, showing an average of 0.48 per cent., nearly all of which contained upwards of 0.40 per cent. Six samples of the commercial tincture yielded an average of 0.018 part in 100 fluid parts, and seven of the official green extract from 0.77 to 1.24, or an average of 1.00 per cent.

Farr and Wright, in their well-known researches on tinctures, examined twelve samples prepared by themselves from English and German leaves, the average being nearly 0.025, the English samples 0.028, German 0.017 part in 100 fluid parts.

A. Smith (*Ph. J.* [3], xvii., p. 835) examined three samples of the commercial succus, and found from "a trace" to .05 per cent.

Collecting these various results together, we find the following averages and suggested standards:—

		Average Per cent	Suggested Standard. Per cent.
Alcoholic Ext.	Dunstan & Ransom	2.9	2.0
	Cowie	3.2	4.0
	Barclay	—	3.0
Extract	Barclay	1.0	—
Liniment	Ransom	.19	0.2
	Barclay	—	0.25
Tincture	Dunstan & Ransom	—	Not under } 0.034
	Wright & Farr	.025	— } 0.025
	Barclay	.018	— } 0.025
Succus	Smith	.08	—

Taking Barclay's figures for the root, and assuming an average yield of about one-eighth of alcoholic extract, the following would be the average strength of such extract for each year:—

1887	.. 7 spls.	.. 4.48 per cent.	1891	.. 4 spls.	.. 4.40 per cent.
1889	.. 8 spls.	.. 3.20	1892	.. 2 spls.	.. 3.68
1890	.. 2 spls.	.. 2.88			

Average of five years, 3.84 per cent.

It would thus seem that the evidence from their own figures, as well as Barclay's, goes to show that Dunstan and Ransom's standard of 2 per cent. for the alcoholic extract is too low, whilst Cowie's is too high; in fact, Barclay's would be about as reasonable a figure as could well be adopted, certainly not too high. It is, however, a very important question whether the alcoholic extract is really the most satisfactory starting point for a series of standardised preparations of belladonna. Wright and Farr, at least in so far as tinctures are concerned, strongly object to extracts in general for this purpose, and they are supported by Martin and others, the objections being chiefly:—

1. The exposure to heat changes some of the constituents of the drug, so much so that the extract does not dissolve to a clear tincture, which tincture is also darker in colour and more liable to deposit than if made direct from the crude drug.
2. The extract may not contain the active principles in the condition in which they naturally exist on account of the prolonged heating.
3. Few extracts long remain in the same condition of dryness, etc.
4. There is needless waste of time.

They, therefore, advocate the preparation of a strong tincture as the starting point for standard tinctures in general. In so far as belladonna is concerned, the second objection has, I think, little ground, but the third is of peculiar force. If a jar of the alcoholic extract be left in a moist atmosphere for a single day only, it will be found in a semi-liquid condition on the surface. To put this into actual figures I left 226 grains of the extract for three days in a moderately damp place; at the end of that time it weighed 240 grains, corresponding to a gain of 5.8 per cent. The colour also of liniment or tincture prepared from an extract is very much darker than that made by B.P. process. This matter of colour is by no means improved by Dunstan and Ransom's suggestion of a powdered extract, although if kept in a tightly-closed bottle this expedient partially avoids the difficulty of deliquescence.

It seemed to me, therefore, that experiments were desirable in order to ascertain whether: (1) the

use of spirit of other strength than that employed by Barclay would yield a less deliquescent extract, or failing that (2), whether a liquid extract could not be prepared sufficiently strong to serve for the preparation of the liniment and tincture by dilution, and yet containing a sufficiently small proportion of "extractive" to serve for production of the alcoholic extract, etc.

There are two other objections to the extract prepared by Barclay's process, viz., such an extract contains so much mucilaginous matter that it requires a good deal of rubbing with the spirit to be satisfied that all the alkaloids have been removed from the insoluble portion, and the extract obtained by weak spirit requires a rather more complicated process for its assay, owing to this same mucilage.

Four experiments were therefore made on the first point as follows:—Four separate quantities of half a pound of the root in No. 20 powder were moistened with 6 fluid ounces of spirit, sp. gr. '838, and after standing all night, packed firmly in a percolator. Fourteen fluid ounces more spirit was now poured on in successive quantities of four ounces, after which the separate percolators received one pint of spirit of varying strength, as under:—

No. 1 mixture of spirit and water 3 to 1 by measure.

" 2	"	"	" 2 to 1	"
" 3	"	"	" 3 to 2	"
" 4	"	"	" 1 to 1	"

Percolation was stopped when 18 fluid ounces of percolate had been obtained from each, which was then evaporated to an extract—Nos. 1, 2, 3, 4.

Water was then poured over contents of percolators until one pint of weaker tincture had been obtained from each, which was also evaporated for extract—Nos. 1a, 2a, 3a, 4a.

Each of these was weighed and assayed, the results being recorded in the following table:—

No. of Extract	Percentage of Alkaloids.	Weight of Extract.	Weight of Extract containing 8% of Alkaloids.	Total Alkaloids in Grains.
1	4.12	315 grs.	469 grs.	16.19
1a	.71	453 grs.		
2	4.06	325 grs.	481 grs.	17.32
2a	.79	510 grs.		
3	3.74	334 grs.	436 grs.	15.75
3a	.57	572 grs.		
4	3.63	339 grs.	427 grs.	16.06
4a	.58	647 grs.		

It will be seen from these figures that the total amount of alkaloids extracted by Barclay's method No. 4, and by the stronger spirit (3 to 1) used for No. 1 is practically the same, but that the actual yield of 3 per cent. extract is greater in No. 1.

Each of these was now mixed in proportions to form a 3 per cent. extract, and kept in a covered jar for a few days; in every instance a considerable amount of moisture had been absorbed, rendering the extract quite soft for some depth below the surface.

The next step was to endeavour to produce a strong liquid extract, and for this purpose two pounds of the root (containing 0.50 per cent. of alkaloids) was divided into four equal parts and treated by re-percolation with a mixture of spirit

and water, 4 to 1, reserving the first sixteen fluid ounces of percolate from the final percolator, and also a second portion of sixteen fluid ounces.

Each of these was assayed and found to contain in 100 fluid parts .786 and .104 respectively, representing 78.6 and 10.4 per cent. of the actual alkaloids present.

When mixed with rectified spirit this liquid extract produced a very considerable precipitation. It was therefore thought desirable to use a rather more strongly alcoholic menstruum, consequently 1½ lb. was similarly treated in four portions, with a mixture of rectified spirit 7, water 1, by measure, reserving 12 fluid ounces. This extract contained 0.73 part alkaloids in 100 fluid parts. It was found to be far better for the production of the liniment, but formed a still more satisfactory mixture on the addition of a small proportion of water.

Having thus proved that a sufficiently strong liquid extract can be easily prepared, the next step was to settle the standards of strength, and then to devise satisfactory formulæ for the various official preparations.

The root itself should, I think, be required to contain from 0.4 to 0.6 per cent., limits between which it will be easy to find plenty of bales. In my experience it may contain anything from .3 to upwards of 1.0 per cent., but seldom above .6 or much below .4. The German root is not inferior to the English, and should by all means be allowed.

The leaf it is quite unnecessary to retain for the preparation of the tincture, the dose of which, being but small, it will not materially alter the colour of mixtures to use a root tincture; however, I would, solely on account of its very extensive use, retain the present extract, but also would wish to introduce a standardised powdered root extract of similar strength, so that in time the survival of the fittest would determine which is to remain official. My experience of the assay of the official extract is in accord with Barclay's, the average being near to 1 per cent., rather below than above.

The succus, so far as I know, and several pharmacists having large dispensing businesses tell me the same, is very little prescribed, and consequently would be no great loss if deleted from the Pharmacopœia; in common with the extract it cannot readily be standardised.

The alcoholic extract, as referred to above, should contain 3 per cent.

The liniment might contain 0.25 part in 100 fluid parts, this being more in accord with the proportion in the root than Ransom's suggested .20 per cent.

The tincture, as recommended by Farr and Wright and Barclay, might be one-tenth of the strength of the liniment.

In addition to these official preparations, the glycerin is largely used, and will probably be official in the next issue of the Pharmacopœia; it could be made from the liquid extract so as to contain .5 parts in 100 fluid parts.

If these standards be accepted, the most convenient strength for the liquid extract will be 0.75 part in 100 fluid parts, and the following will be the formulæ of a full list of standardised official preparations, including the glycerin and powdered extract, as suggested above:—

Emplastrum Belladonna.

Take of—

Liquid extract of belladonna	4 fl. ozs. or 100 C.c.
Resin plaster } Of each..	2½ ounces or 62½
Soap plaster* }	grammes.

Evaporate the liquid extract of belladonna by the heat of a water bath until it is reduced to 1 ounce (or 25 grammes), then add the plasters, previously melted, and mix the whole thoroughly together.

It contains 0.5 per cent of alkaloids.

Extractum Belladonnae Alcoholicum.

Take of—

Liquid extract of belladonna ...	21 fluid ounces, or 1050 C.c.
Sugar of milk in powder ...	a sufficiency.

Take 1 fluid ounce (or 50 C.c.) of the liquid extract of belladonna, evaporate it in a tared dish over a water bath, until it is reduced to a moderately firm extract, and weigh. The difference between the weight of the extract and ½ ounce (or 12.5 grammes) will give the amount of sugar of milk required for 1 fluid ounce (or 50 C.c.) of the liquid extract:—

Distil off the spirit from the remaining 20 fluid ounces (1000 C.c.) of liquid extract, add the required amount of sugar of milk as shown by experiment, and evaporate over a water bath to a firm extract, which should weigh 5 ounces or 250 grammes.† This extract will contain 3.0 per cent. by weight of the alkaloids of belladonna:—

Extractum Belladonnae Liquidum.

Take of—

Belladonna root in No. 20 powder...	2 pounds or 1280 grammes
Rectified spirit,	
Distilled water, of each a sufficiency.	

Divide the belladonna root into four equal portions, and damp the first with 6 fluid ounces (or 240 C.c.) of a mixture of 7 fluid parts of rectified spirit with 1 fluid part of distilled water; allow to stand in a covered vessel for six hours, then pack firmly and uniformly in a percolator. Pour over the surface of the powder 4 fluid ounces (or 160 C.c.) of the same mixture of spirit and water, and when the liquid begins to drop close the lower orifice of the percolator and allow to macerate for twenty-four hours. Now continue slow percolation, adding more of the same menstruum as required, and use the first 6 fluid ounces (or 240 C.c.) of percolate to damp the second portion of belladonna root. Collect now the percolate in fractions of 4 fluid ounces (or 160 C.c.) each, or less, and having packed the second portion of moistened root in another percolator, use the fractions of percolate successively for its extraction, carrying on the operation exactly as in the first percolator. The first 6 fluid ounces (or 240 C.c.) from the second percolator is used to damp the third portion of powder, and this system of re-percolation is carried out through the whole series of percolators. Reserve the first 12½ fluid ounces (or 500 C.c.) of percolate from the fourth percolator and recover the spirituous liquor from the marc by displacement with water or pressure.

* This is rather weaker than the present emplastrum, in the proportion of 5 to 6; the official plaster is frequently complained of as being too strong.

† That no loss occurs was proved by direct experiment, 3.06 being obtained instead of 3.12 by theory, a difference within limits of experimental errors.

This weaker percolate may be used instead of fresh menstruum when again preparing the liquid extract, or it may be concentrated to an extract, dissolved in rectified spirit, and added to the reserved portion of percolate.

Determine now the proportion of alkaloids in the reserved percolate by the following process:—

Introduce 10 C.c. into a separator, add an equal volume of chloroform with 50 C.c. of distilled water and a decided excess of solution of ammonia, agitate and set aside for the liquids to separate; draw off now the chloroform and agitate the aqueous liquid with another 10 C.c. of chloroform, drawing off as before; repeat a third time, and reject the aqueous liquid.* Agitate the mixed chloroform solutions thoroughly with 5 C.c. of dilute sulphuric acid, mixed with twice its volume of warm distilled water; separate the chloroform, and agitate with a second portion of acidulated water. Wash the mixed acid liquids with a little chloroform, then agitate vigorously with 10 C.c. of chloroform and an excess of solution of ammonia, drawing off the chloroform when it has separated. Repeat this agitation and separation twice with half the quantity of chloroform, wash with a small quantity of distilled water, draw off into a tared flask or dish, evaporate, dry, and weigh. Dissolve now the alkaloidal residue in 10 C.c. of HCl, and finally add $\frac{\text{NaHO}}{100}$ till neutral, using methyl-orange or iodeosine as indicator. From this calculate the amount of alkaloids 1 C.c. $\frac{\text{NaHO}}{100}$ being equivalent to .00289 Gm. of atropine. This should correspond closely with the amount found by weighing.

Add now to the remainder of the reserved percolate sufficient of the original menstruum to produce a liquid containing 0.75 part of alkaloids in 100 fluid parts.

Glycerinum Belladonna.

Take of—

Liquid extract of belladonna	4 fl. ozs. or 100 C.c.
Glycerin	a sufficiency.

Evaporate the liquid extract by the heat of a water bath until it is reduced to a soft extract, then add sufficient glycerin to make the whole measure 6 fluid ounces (or 150 C.c.), mixing thoroughly.

One hundred fluid parts will contain 0.5 part of alkaloids of belladonna.

Linimentum Belladonna.

Take of—

Liquid extract of belladonna	10 fl. ozs. or 250 C.c.
Camphor	1 oz., or 25 grammes
Distilled water	2½ fl. ozs., or 62½ C.c.
Rectified spirit	a sufficiency.

Dissolve the camphor in 10 fluid ounces (or 250 C.c.) of the spirit, and mix the solution with the liquid extract and water, adding sufficient rectified spirit to produce 30 fluid ounces (or 750 C.c.). Allow to stand for twenty-four hours in a cool place, and decant or filter from any deposit.

One hundred fluid parts contain 0.25 part of the alkaloids of belladonna.

* The third washing contains an appreciable amount of alkaloids, two experiments yielding me 1.5 and 2.0 Mgm. respectively.

Pulvis Extracti Belladonna Compositus.

Take of—

Liquid extract of belladonna	4 fl. ozs., or 100 C.c.
Sugar of milk, in fine powder	a sufficiency.

Evaporate the liquid extract by the heat of a water bath until it is reduced to a soft extract; add now 2 ounces (or 50 grammes) of sugar of milk, and rub well together. Dry the resulting paste at a temperature not exceeding 212° F. (100° C.), reduce it to fine powder, and add sufficient sugar of milk to bring the whole to the weight of 3 ounces (or 75 grammes).

Note.—This preparation contains 1 per cent. of the alkaloids of belladonna, and corresponds in strength and dose to the green extract obtained from the fresh leaves. It should be kept in well-closed bottles.

Tinctura Belladonnae.

Take of—

Liquid extract of belladonna	1 fl. oz. or 30 C.c.
Proof spirit	29 fl. ozs. or 870 C.c.

Mix, allow to stand for twenty-four hours in a cool place, and filter.

100 fluid parts contain 0.025 part of the alkaloids of belladonna.

Unguentum Belladonnae.

Take of—

Liquid extract of belladonna	1 fl. oz. or 20 C.c.
Benzoated lard	2½ ozs. or 45 grammes.

Evaporate the liquid extract on a water bath until it is reduced to a quarter of an ounce (or 5 grammes), add the benzoated lard, and mix thoroughly.

One hundred parts contain approximately 0.3 part of the alkaloids of belladonna.

EMPLEURUM SERRULATUM.

BY JOHN C. UMNEY.

The leaves of *Empleurum serrulatum* occasionally appear in the port of London, either mixed with, or simultaneously with the shipments of *Barosma serratifolia*. Unfortunately, when offered for sale by public auction, the drug is generally described in the brokers' catalogues as Buchu. This practice has prevailed for twenty-five years or more, and reference is made to the leaves by Hanbury in 'Pharmacographia' (p. 99, edition 1874) in the following terms:—

"The leaves of *Empleurum serrulatum*, Ait., a small shrub of the same order as *Barosma*, and growing in the same localities, have been imported rather frequently of late and sold as buchu. They have the same structure as regards mucilage, and nearly the same form as those of *B. serratifolia*, but are easily distinguished. They are still narrower and often longer than those of *B. serratifolia*, and terminate in an acute point without an oil duct; they have a bitterish taste and a different odour from buchu. The flowers of *Empleurum* are still more distinct, for they are apetalous and reddish brown. The fruit, consisting of a single, compressed, oblong carpel, terminated by a flat sword-shaped horn, is quite unlike that of Buchu."

The fruit to which reference is there made differs from that of various species of *Barosma*, which have five carpels covered with glandular dots; and the fruits, being almost always present in the bales of leaves, may afford excellent indication of the presence of *Empleurum* in the samples of leaves under examination. Holmes also has pointed out (*Ph. J.* [3], viii., 363) another distinguishing feature of the leaves, viz., that when the leaf of *Barosma serratifolia* is held up to the light, the lateral veins are seen to be straighter, longer and more strongly developed than in the leaves of *Empleurum serrulatum*. The Hanbury Herbarium contains an excellent specimen of the dried plant, in which these important differences of both leaves and fruits may be readily observed.

Within the last two years, at occasional intervals, several bales of these leaves have been imported in excellent condition and unmixed with those of any species of *Barosma*, and it was with a view of seeing what differences existed between these leaves and buchu that the experiments of which the results are detailed below were carried out.

An interesting analysis is recorded* of the leaves of *Barosma crenulata*, which was probably the first species imported, which agrees fairly well with the results obtained in an examination of the leaves of *B. betulina*, which has been carried out for comparison with the *Empleurum* leaves.

Water removed by successive boilings a considerable quantity of mucilage, which corresponds in behaviour with that derived from *Barosma betulina*. It is not readily precipitated by alcohol, but affords a considerable precipitate with neutral acetate of lead.

The total amount of aqueous extractive dried at 100°C. was 43.4 per cent., or slightly in excess of that obtained from the *Barosma* leaves, 36.2 per cent.

The aqueous infusion of the leaves possesses an odour resembling trimethylamine, possibly due to decomposition, and is so marked as to be distinctly noticeable in the freshly-distilled volatile oil, although it rapidly disappears on exposure to the air. It renders the taste of the infusion, moreover, so nauseous as to preclude the use of the drug, in the form of a fresh aqueous infusion at any rate, even though the therapeutic action be proved to be similar, as a substitute for buchu. Ferric chloride has practically no effect on the cold infusion of *Empleurum* leaves, whilst with that prepared from *Barosma betulina* a distinct greenish coloration is produced.

Alcohol extracts from the leaves, after the removal of fat and chlorophyll, 4.63 per cent. of a golden-yellow varnish-like body which, when treated with water, is only partially soluble. The insoluble portion had the characters of a soft resin, whilst the soluble part showed marked glucosidal reactions and was decidedly bitter.

The leaves of *Barosma betulina* yielded 6.91 per cent. of extractive to the same solvent, but differed in not containing any appreciable quantity of resin. After precipitation with neutral acetate of lead, the filtrate continued to show powerful reducing power with Fehling's solution.

Volatile Oil.—The leaves possess a not unpleasant piperaceous odour, quite distinct, how-

* 'Gmelin's Chemistry,' ii., 1258.

ever, from that of buchu, and afforded on distillation 0·64 per cent. of a volatile oil, which was accompanied by the peculiar body having a fishy smell already referred to above.

After the disappearance of this on exposure to the air the oil possesses an odour recalling rue, though more pleasant, and has a specific gravity of '9464 at 15° C. After keeping for some months, and even after cooling to -5° C., it showed no sign of separation of stearopten. It distils between 200° C. and 235° C., the greater portion passing over between 220°-230° C.

This fraction affords a crystalline compound with bisulphite of sodium, and may correspond with methylonylketone, which is contained in oil of rue in considerable quantity, and may be separated from that oil by fractionation and treatment of the portion, distilling from 220°-228° C. with bisulphite of sodium; it does not, however, solidify on exposure to cold.

A quantity of the leaves of both *B. betulina* and *B. serratifolia* has been distilled for the purpose of comparison with the following results:—

From *B. betulina* 1·4 per cent. of volatile oil was obtained, which deposited at ordinary temperatures a stearopten amounting to about 30 per cent. of the whole oil, which after recrystallisation from alcohol melts at 82° C., and at a slightly lower temperature after resublimation, and agrees in general characters with diosphenol. The liquid portion of the oil after removal of the stearopten boils at 205-210° C., and has a sp. gr. of '9579 at 15° C.

Messrs. Schimmel record a larger percentage of volatile oil from *B. betulina*, viz., up to 2 per cent. the sp. gr. being '969 and yielding a considerable proportion of diosphenol.

Barosma serratifolia yielded '8 per cent. of volatile oil, from which no stearopten could be separated by cooling, and having a sp. gr. of '9615 at 15° C.

The following table includes the principal

Comparison of Essential Oils of

	<i>Empleurum serrulatum</i> .	<i>Ruta graveolens</i> .	<i>Barosma betulina</i> .	<i>Barosma serratifolia</i> .
Yield of oil	0·64 per cent.	0·17 p. c. (Schimmel)	1·4 per cent.	0·8
Sp. gr. at 15° C.	'9464	'5884	'9579 Liquid portion only	'9615
Exposure to low temperature	No separation of stearopten	Solidifies	Solidifies	Does not solidify
Solubility in alcohol of 80 p. cent. in volume	Equal volume	Equal volume	Less than equal volume	Equal volume
Range of boiling point	200°-225° C.	200°-240° C.	Liquid portion 205-210° C.	205°-220° C.
Ferric chloride (presence of phenol or allied bodies)	None	None	Marked reaction (diosphenol)	None

features of the oils of *B. betulina*, *B. serratifolia*, *Ruta graveolens*, and *Empleurum serrulatum*. The

reaction of the oils with ferric chloride is confirmatory of the absence of diosphenol in the oils of both *B. serratifolia* and *Empleurum serrulatum*.

Special search was made in the *Empleurum* oil for salicylic acid, the presence of which in buchu oil was announced by Wayne,* but could not be found either in the oil of *B. betulina* by Maisch,† or in that of *B. serratifolia* by Bedford.‡ The suggestion of Professor Maisch that the presence of another kind of leaves, whether of the genus *Barosma* or some other genus, might account for the yield of salicylic acid may be therefore correct, but my observations point to the fact that such admixture was not, at any rate, the leaves of *Empleurum serrulatum*.

The proportions of extractive yielded to various solvents are tabulated below for comparison:—

	<i>Barosma betulina</i> per cent.	<i>Empleurum serrulatum</i> per cent.
Loss at 100° C.	1·42	10·4
Mucilage and extractive removed by successive treatment with boiling water	36·2	43·4
Volatile oil	1·4	0·64
Petroleum ether extract (principally fatty matter)	5·8	3·9
Ether extract (chlorophyll, etc.)	2·1	2·55
Alcoholic extract	6·91	4·63

It is evident, therefore, that though the leaves of *E. serrulatum* show certain botanical and chemical affinities with buchu, their use as a substitute for that drug is not permissible without therapeutic examination.

CUBEBES AND ITS ADULTERATIONS.‡

(Concluded from page 758)

11. *Piper sylvestre*, Lam.—The fruits in the Herbarium at Kew, which were examined, were gathered in Ceylon by Thwaites, and are cited as authentic by De Candolle. They are small, globular, mucronated, blackish, and scarcely reticulated, about 3·5 milli-



Fig. 9.—Median vein of leaf of *Piper caninum* (P), transverse section.

metres long and 3 broad, and the pedicels are only 1 mm. long. The structure of the fruit is almost identical with that of *Piper clusii*, and that of the stem with the stem of *Rinorea badak*, differing only in the flattened vascular bundles.

* 'Year-Book,' 1876, p. 229.

† 'Year-Book,' 1882, p. 196.

‡ 'Year-Book,' 1882, p. 196.

§ Abstract of paper by Dr. De Wever.

12. *Piper*.—Dr. De Wevre has found in cubebs another *Piper*, which at first he thought might be the young fruit of the *Piper cubeba* var. *crassipes*. He was, however, able to identify it with that of a plant in the Museum of the Society, received from Professor van Eeden, and which came from Java, bearing the native name "Kemokcesan këmèkès," or "Danceng Boesoeng."

The fruit resembles that of *P. lowong* in structure, having neither stone cells in the hypoderm nor in the endocarp, nor crystals of oxalate of calcium in the epidermal cells. The essential oil glands in the epicarp are, however, few, but large. The fruit is small, elliptical, elongated into a beak at the apex, and attenuated at the base into a short pedicel about $1\frac{1}{2}$ millimetre long.

Fruits not derived from the Piperaceæ, but met with in Cubebs.

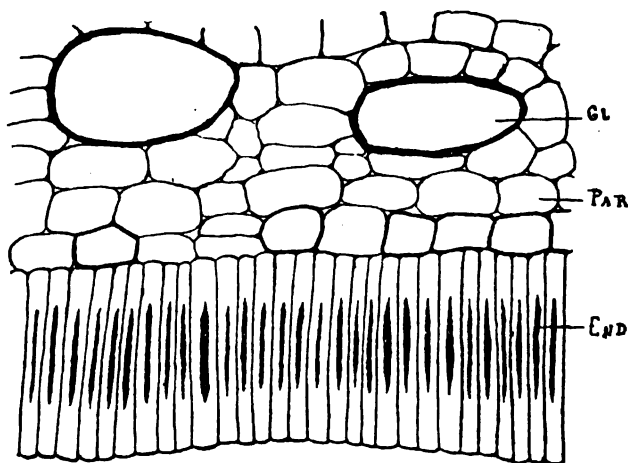


Fig. 10.—Endocarp and parenchyma of fruit of *Daphnidium cubeba*, transverse section.

Daphnidium cubeba.—This fruit had been stated to be identical with that of *Tetranthera citrata* by Holmes, and Dr. De Wevre proved by a histological examination that the fruits of this false cubeb and of that of the *Tetranthera citrata* received from Java, and now in the Society's Museum, are identical in structure. The endocarp consists of long, narrow, sclerenchymatous cells, crowded closely together in a single line, and arranged radially. The taste of the fruit is slightly bitter and aromatic, but not burning. It has usually no pedicel, and the pericarp contains a dicotyledonous seed without albumen, whereas in the cubeb the embryo is too small for the naked eye to distinguish the cotyledons, the mass of the seed consisting of albumen. The cells of the endocarp, have a very narrow linear cavity, and are very distinct from those of cubebs (Fig. 10).

Rhamnus, sp.—The sample of adulterated cubebs containing fruits referred to *Rhamnus** was furnished by the Museum of the Pharmaceutical Society of Great Britain.

Dr. De Wevre has no hesitation in referring the

adulteration to *Rhamnus*, although unable to identify the species. He gives the following characters:—

The fruits are rounded, but compressed laterally; on the lateral faces there are two rather deep furrows, separating the fruit into two, and on the other two sides a very slight median ridge.

Their colour is black, somewhat hidden by a whitish powder; the surface presents longitudinal ridges, which sometimes anastomose by means of lateral ridges.

The odour resembles that of *Daphnidium cubeba*, mixed with the scent of a cigar box. The fruits have but little taste; after a time, however, a slight aromatic flavour is perceptible. In size they are nearly the same as cubebs. Sometimes a calyx with six teeth is observed at the base of the fruit. The fruit internally shows two cells, between which a columella, due to the elongation of the pedicel, is visible. The pericarp contains resinous matter. The

powdered fruits are distinguished under the microscope by the presence of a great number of stone cells of very different form to those of cubebs. They are narrower, often long, forked at the extremities, sometimes very irregular and mammillated. There are also bundles of long fibres, with pointed ends and thick walls. The cell-walls of the perisperm are coloured blue with iodine, which is never the case with cubebs. The same coloration takes place also with the fruits of *Embelia ribes*, which Dr. De Wevre suggests may some day be found in cubebs, as they have already been in black pepper. The fruits contain crystals of oxalate of calcium but no starch. Dr. De Wevre also gives details of

the fruit of *Piper nigrum*, of which he remarks that there are two varieties, viz., *trivium* and *macrostachyum*, and of allspice fruit, which M. Brunotte states that he has found in cubebs.

The conclusions at which Dr. De Wevre arrives as the result of his investigations are as follows:—

Piper cubeba is a variable plant, the principal forms being "*Rinoe katoentjar*," "*Rinoe badak*," "*Rinoe tjaroelock*," and var. *crassipes*, De Wevre.

Piper ribesioides is properly an *Artanthe*.

Piper sumatranum is either identical with *P. ribesioides*, or is a variety of it.

Piper crassipes, Korth., is very near *P. ribesioides*, but requires further examination to determine its value as a species.

In *Piper nigrum* and in the *Piper* with a short pedicel (*P. schizonephros* or *P. baccatum*?) the endocarp is only cutinised, not stony, and the hypodermal stone cells are very much developed.

In *Piper mollissimum*, Bl., the endocarp is not sclerenchymatous, and the stone cells of the hypoderm are sparingly developed.

In *Piper olusii*, D.C., and *P. guineense*, Schum., neither the endocarp nor the hypoderm present stone cells.

In *Piper lowong*, Bl., and *P. sylvestre*, Lam., both

* *Chemist and Druggist*, Nov., 1886, p. 620.

of Javanese origin, the structure is the same as in the two preceding African species.

The name of *Piper caninum* is applied to several plants. The true *P. caninum* is, in Dr. De Wevre's opinion, the one at Kew, the fruit of which has short pedicels and a structure resembling that of *P. olusii*.

The pepper with short pedicels resembles *P. lowong* in structure.

With respect to the detection of adulterations, it is possible by the use of the microscope to detect some of them, but in many cases there are not sufficient characteristic features to serve for their detection when mixed with the true cubebs. In some cases, as in *Piper cubeba*, var. *crassipes*, *P. ribesoides*, *P. crassipes*, Korth. *P. sumatranum*, the presence of numerous polygonal stone cells will indicate adulteration, and the relative absence of stone cells in *P. olusii*, *P. lowong*, *P. caninum*, and *P. sylvestre* would indicate the presence of an adulterant. The endocarpic cells of *Daphnidium* are so distinct that they would easily be seen if the powder were first cleared with liquor potassæ or *Eau de javelle*, and the colouring of the cell walls with iodine solution would indicate the presence of *Embelia ribes* or *Rhamnus* fruits.

Dr. De Wevre, however, advises pharmacists to buy their cubebs whole, and to examine the fruits before powdering them.

THE RELATION BETWEEN CHEMICAL CONSTITUTION AND PHYSIOLOGICAL ACTION.*

BY T. RHYMER MARSHALL, D.S.C., EDIN.,

Professor of Chemistry, St. Mungo's College, Glasgow.

(Concluded from p. 607.)

ALDEHYDES.

We shall next consider the second group, where the paraffins have undergone still further oxidation. Here we have two hydroxyl residues replacing hydrogen atoms, and we have produced a group of bodies called aldehydes, which all possess the extremely active residue $\text{CH}(\text{OH})_2$. This residue, however, is very unstable, and under ordinary conditions splits off a molecule of water (COH). The activity of living protoplasm is most probably due to this aldehydic group, and the readiness with which this residue condenses or combines with other active bodies, polymerises or becomes oxidised to acids or reduced to alcohols, enables a number of complex changes to take place. This extreme mobility explains the extraordinary multiplicity of actions which take place in living protoplasm.

Aldehydes are very powerful hypnotics, but cannot be used owing to their powerful action on the tissues. This powerful action is greatly modified when the aldehydes are polymerised into closed chains—e.g., CH_3COH into para-aldehyde $\text{C}_6\text{H}_{10}\text{O}_8$. The aldehyde hypnotics do not depress the heart like the halogen derivatives of the paraffins. We can greatly increase the narcotic power by substituting halogens in place of the hydrogen in the aldehydes—e.g., chloral $\text{CCl}_3\text{CH}(\text{OH})_2$. Chlorine is best, because bromine and iodine produce a too powerful depressing action on the

heart. The strongly irritant action of aldehydes may be also greatly modified by replacing the hydrogen of the hydroxyl residues by the radicle methyl, as in methylal $\text{CH}_2(\text{OCH}_3)_2$.

ACIDS.

The aldehyde group is readily oxidised to a stable radicle possessing acid properties ($-\text{COH} + \text{O} = -\text{COOH}$), but which is incapable of forming firm addition products with living tissue. These acids, like aldehydes, also act as hypnotics and anesthetics, but from an entirely different cause. The activity of the protoplasm in a cell depends upon the oxidation of the aldehyde group to an acid group, and the acid waste, unless removed by alkalies present in the blood, diminishes the oxidation process. Acids, when brought into contact with nerve cells, will therefore have a hypnotic effect, by contracting the protoplasm and lessening the oxidation.

The acids, when introduced into the system of mammals, will not act as soporifics, because they reach the nerve-centres as salts.

Having considered the general sedative effects of a few classes of compounds of carbon and hydrogen, and carbon, hydrogen, and oxygen, on the animal organism, it will now be of advantage to take up another class of bodies, whose general physiological action is exciting—namely, ammonia and its substitution derivatives.

Ammonia, NH_3 , is a gaseous compound of nitrogen combined with three atoms of hydrogen, and may be classed amongst one of the most active radicles in chemistry. This group is capable of combining loosely with water to form a hydrate, and with acids to form a class of bodies known as ammonium salts. Ammonia also combines with a large number of organic substances to form complicated compounds.

The most marked general physiological effect of ammonia and ammonium salts is their stimulating and afterwards paralysing action on the spinal cord. By replacing the hydrogen atoms of ammonia salts by alkyl radicles, the physiological action is altered considerably. The substitution of even a single atom of hydrogen by an alkyl group appears to lessen the tetanising action of ammonia, and this diminution is increased by further substitution of 2 or 3 atoms; then a change takes place, and when the fourth atom is replaced a convulsant action again becomes marked, but it is not so great as in the case of ammonia. All nitrogen substances of this type have therefore a tendency to convulsant action.

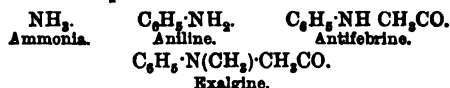
The well-known ptomaines—neurine, choline, and muscarine, are fully substituted ammonium compounds. Neurine, $\text{N}(\text{CH}_3)_3(\text{CH}=\text{CH})\text{OH}$, contains an unsaturated radicle; choline, $\text{N}(\text{CH}_3)_3(\text{CH}_2\text{CH}_2\text{OH})\text{OH}$, an alcohol residue; and muscarine, $\text{N}(\text{CH}_3)_3(\text{CH}_2\text{COH})\text{OH}$ an aldehydic group. All these active groups modify the toxic power of the ptomaines, but they all possess the power of irritating the peripheral extremities of nerves going to the secreting cells or to involuntary muscular fibres, and thus cause a state of violent contraction in these muscles. This is known as the curare action.

Preliminary to discussing other important deriva-

* From the Glasgow Medical Journal for January.

tives of ammonia, it will be necessary to refer to the unsaturated closed chain of 6 carbon atoms known as benzene C_6H_6 , which is present as a nucleus in the so-called aromatic compounds. Hitherto we have only dealt with simple open chains. Benzene tends to produce increased sensibility, inco-ordination, and tremor, so that the effect of substituting a benzene radicle C_6H_5 in place of a hydrogen atom in ammonia, would be to modify the convulsive effect of ammonia. The action would therefore never assume that of true tetanus. To express the matter simply, we would say that the general physiological effect of a substituted ammonia containing a benzene nucleus is so to act on the grey matter of the cord, that stimuli do not reach the brain. This action is called analgesic action, which is the power of relieving pain.

By replacing another hydrogen of the ammonia, now containing a benzene ring, by acetyl, CH_3CO , we further modify the tetanic action of ammonia, and produce the valuable antipyretic and analgesic, *antifebrine*, $C_6H_5 \cdot NH \cdot C_2H_5O$. The still stronger analgesic, *exalgine*, $C_6H_5 \cdot N(CH_3) \cdot C_2H_5O$, is antifebrine with the remaining hydrogen replaced by methyl. Those substances which act as antipyretics are supposed to affect the temperature of the body by acting upon definite centres of the brain. The stimulation of these centres causes contraction of the protoplasm in the muscle and gland cells, thus lessening the oxidation process which is the source of heat.



ANTISEPTICS.

In the earlier part of the paper I referred to the anæsthetic properties of the halogen derivatives of the paraffins, but did not mention the antiseptic action which the halogens convey to the hydrocarbons. It is found that all highly halogenated derivatives of the hydrocarbons are powerful antiseptics, but are dangerous owing to their anæsthetic action; still, they are useful where this latter property is desired. The derivatives of benzene and other closed chains are more powerful and less poisonous than the above; and there are a large number of benzene derivatives containing iodine, which are superior to iodoform (which is the most powerful of the paraffin series), as they are devoid of smell, and probably produce no poisonous effects.

In considering the employment of antiseptics for internal disinfection, we must be very careful to study the effect they may produce on the organism. It is found that the diphenyl (diphenyl, $C_6H_5 - C_6H_5$) are less poisonous and more powerfully antiseptic than the benzene (benzene, C_6H_6) derivatives. It is, however, interesting to note that the poisonous action of benzene can be greatly reduced by sulphonating. For instance, the poisonous carbolic acid, C_6H_5OH , which possesses powerful antiseptic and slight anæsthetic properties, is converted into the comparatively safe antiseptic substance, *aseptol*, $C_6H_4 \cdot OH \cdot SO_3H$, by introducing the sulphonic acid radicle $-SO_3H$. Probably the safest and most potent antiseptic will be found amongst the diphenyl sulphonic acid derivatives.

THE EFFECT OF HYDROXYL IN BENZENE.

Benzene, although active to a slight degree itself, is converted into a powerful poison and antipyretic by the introduction of the hydroxyl group, which again proves the great activity of this radicle. This toxic action is increased with the increased number of hydroxyl groups.

THE PYRIDINE CLASS OF BODIES.

Pyridine, C_5H_5N , may be looked upon as benzene with one of the carbon atoms replaced by nitrogen. This pyridine nucleus is interesting from a physiological point of view, as it is to be found present in nearly all the alkaloids, and there is no doubt that this group characterises the physiological action of these complicated bodies. Dr. Stockman has found that all the pyridine derivatives have an antiseptic and antipyretic action. In studying the physiological action of pyridine and its derivatives, he found that the action was diminished by substituting alkyl groups in place of the hydrogen atoms; also, that by saturating the ring by addition of hydrogen they are rendered nearly harmless.

By saturating the nitrogen by the addition of methyl iodide, the physiological action is so modified that a curare action is produced (the property of paralysing the motor nerves). It is, however, well to remember that, in all these cases of substitution and addition to a nucleus, the change in physiological action is not sudden or profound, but that this action is simply modified in particular directions, although the symptoms produced may be in themselves profound.

CULTIVATION OF GINGER IN JAMAICA.

The Director of the Public Gardens and Plantations in Jamaica has recently drawn up, at the request of the Governor, a report on the ginger crops in the island. It is well known that Jamaica is noted for its ginger, the produce of the island being the finest quality known in the market, and consequently it realises the highest price. Mr. Fawcett's notes on the subject will, therefore, interest those engaged in its culture, not only in Jamaica but in other ginger-growing countries. He remarks that the quality of commercial ginger is due chiefly to soil, but also to curing, to the variety, white or blue, and to whether it has been freshly planted a few months before, or has been "ratooning" for one or more years. The soil which produces the very highest quality, realising perhaps £10 per cwt. in the London market, is the very deep black soil of the virgin forest. To grow ginger under this condition involves the destruction of large areas of forest.

Magnificent trees, six feet in diameter, may be seen in some districts lying rotting on the ground, while the ginger cultivators have gone further to the centre of the island, abandoning the woodlands already cut down. The plan adopted in clearing the forest is for a cultivator to invite two or three of his friends to a "cutting match"; he provides food and drink, and the laborious work of felling trees is carried on merrily and without much expense. Afterwards fire is applied and the place is burnt over. This burning is considered

very important, as much so as the virgin soil. Probably its importance is due principally to the deposit of potash and other mineral matters contained in the ashes, but the fire also sweetens the ground, correcting sourness, and, moreover, it destroys insect pests. Some cultivators will grow ginger only in freshly-cleared woodlands, and next year they move on to a new clearing, but although they get in this way very fine ginger, it is at the expense of forest land, which would require a very heavy outlay and, perhaps, a term of a hundred years to restore. Albert Town was, not so long ago, a centre for the cultivation, but it seems that growers have already got as far as fourteen miles further inland. Ginger can be, and is, grown in many places, year after year, on the same ground, even for forty years in succession. At Seaford Town, a German colony, one of the original colonists, an old man of eighty-six years, is said to have been cultivating ginger and arrowroot in the same place from his youth, he and other colonists have been in the habit of planting a small patch one year, leaving it to "ratoon," as long as it was profitable, then throwing it up or growing other plants, until, after a term of years, they again plant the same patch with ginger. This is an irregular rotation of crops. "Plant ginger," the produce of planting, is of better quality than the ratoons, and the ratoons in each succeeding year are inferior. When the ground is too poor to grow white ginger, then the inferior blue variety can be grown.

More depends upon the curing of ginger, considering the crop as a livelihood, than soil. At Seaford Town there was a wet season about two years ago; the people could not dry the ginger in the sun; it mildewed; there was very little sun, and the cultivators suffered some distress. Careful attention to the curing is quite the rule, and badly-cured ginger, that is sometimes brought to the market, is due to wet weather, rather than to want of care.

Though it is difficult to make any recommendations on the subject, the following hints are given, as indicating what points are worthy of consideration by cultivators:—The first is the application of manure. There is a prejudice against its use, some maintaining that it breeds worms, and that there is also a difficulty in getting it in any quantity. It is probable that those who have not succeeded with manure have used it improperly, by applying it fresh, or not sufficiently mixed with soil. As to obtaining it in quantity, example should be taken from the Chinese labourer, who preserves every particle of matter that can in any way be utilised as manure, not only cattle manure, but decaying matter of any kind, night soil, etc.; even soapy water, left after washing, is most useful. To imitate the formation of forest soil, a pit might be filled with alternate layers of bush and manure; everything in the nature of manure or decaying matter should be thrown in, and a layer of soil directly over the manure would be useful. The pit ought to be lined with clay, to prevent the very valuable part of the liquid of the manure from escaping, and a cover of some kind should be fixed in some way over the pit, to keep out rain.—*Journ. Soc. Arts.*

GLYCERIN OF THE MARKET.*

BY J. L. TEGARDEN, PH. C.

In order that the sources of impurities and adulterations that are liable to be present in glycerin may be understood, a brief review of the process of manufacture is necessary.

Commercially, glycerin is invariably obtained as the result of the decomposition of neutral fatty bodies in the process of manufacturing either candles or soap. Long experience has shown that fatty oils from all sources yield not isomers and homologues of glycerin, but exactly the same variety of glycerol. Various agents have been employed in the saponification of fats. In former times olive oil was boiled with oxide of lead and water; later the litharge was replaced by lime; succeeding these processes saponification was effected by water and high pressure, by sulphuric acid, by superheated steam and subsequent distillation.

At present by far the greatest amount of commercial glycerin is either a bye-product of the soap manufacture, and is made by saponifying with caustic soda, or is the result of the saponification of fats with some base, under high pressure. The "sweet water," as is called, which is formed, is separated at this point by pressure or distillation, and then concentrated or distilled. In leading manufactories of England and America, zinc oxide is now used to replace one half of the lime. It is claimed that the reducing action of the zinc prevents the discoloration of the fatty acids resulting from other treatment. It will be seen, then, that impurities do not naturally exist in glycerin, but are introduced by the re-agents used in its manufacture.

Neither the colour nor the specific gravity of a sample are safe indications as to whether it consists of crude or distilled glycerin. As a rule, the latter is light in colour, but may be brown and even black, and its specific gravity rarely exceeds 1.261; whereas, the former is usually dark, varying in colour from yellow to black, and ranging in specific gravity from 1.25 and even less to as high as 1.97, according to the degree of concentration. One of my samples which subsequently proved to be a chemically pure article gave a specific gravity of 1.263, while the one containing the most impurities gave a gravity of 1.259. A good indication as to the quality of glycerin can be obtained by subjecting it to ignition, as the amount of mineral residue in distilled glycerin is never more than 0.2 per cent, whereas all crude samples contain much more—soap-like glycerin containing as high as 9 to 14 per cent.

The U.S.P. ignition test is to place a small portion of the glycerin in an open evaporating dish, then heat gently till it ignites. It should burn and vaporise, and not leave more than a dark stain. This establishes the fact of the absence of dextrin and sugar. And then, on full combustion, no residue whatever should be left; this indicates the absence of fixed impurities.

Out of the thirteen samples tested, all were free from sugars and fixed impurities except numbers eight and ten. No. 8 contained a sufficient amount of ash to be considered a crude sample. Sullman and Berry, who are acknowledged by A. H. Allen to be authorities

* Read at the Asheville meeting of the American Pharmaceutical Association.

on this subject, say that a preliminary distinction between a crude and distilled product is indicated by the former causing a great deal of spluttering during volatilisation, while the latter volatilises quietly. In this respect, also, the above suspected sample indicated a very poor quality of a raw or crude glycerin. By a more thorough analysis this sample was found to contain as intentional impurities magnesium sulphate and glucose, these being used extensively in some manufactories for the purpose of adulteration.

Fehling's method is recommended as the best test for the detection of sugars. It is impossible for this substance to occur in glycerin unless employed as an adulterant, and consequently it is only necessary to look for it in a distilled product. The Pharmacopœia directs that 5 C.c. of glycerin be mixed with 50 C.c. of water and 10 drops of hydrochloric acid in a small flask and heated for thirty minutes on a water bath, and then mix 10 C.c. of the liquid with 2 C.c. of sodium hydrate T. S. (=test solution, U.S.P.), and 1 C.c. of alkaline cupric tartrate T. S. No yellowish-red cloudiness should appear within six hours. Some of the samples analysed by this method were found to contain sugar.

To detect the presence of formic and butyric acids, gradually heat 5 C.c. of glycerin with 3 C.c. of dilute sulphuric acid below the boiling point. There should be no offensive or acidulous odour evolved. Six of the samples gave reactions for the above-named acids. As has been stated, the variety of impurities that are found in commercial glycerin are such as are contained in the re-agents used in the manufacture of it. Sulphates and sulphur compounds, chlorides, lead, iron, zinc, calcium, magnesium, arsenic and other metals, oxalic acid, resinous matters and fatty acids are the impurities that are likely to be detected in glycerin. Sulphates always occur where sulphuric acid has been used as the saponifying agent of the fat. Sulphites, sulphides, and thiosulphates are also formed. Calcium is also met with in the form of an oleate. Oxalic acid sometimes occurs in glycerin, being used either as a re-agent or an oxidation product. Three of the samples contained sulphates, five contained calcium salts, none contained oxalic acid, and all were more or less contaminated with chlorine in the form of either a sodium or a calcium salt. The Pharmacopœia says: "No colour, cloudiness or precipitate should appear when separate portions of its aqueous solution (1 in 10) are treated with hydrogen sulphide or ammonium sulphide T. S. (absence of metals), barium chloride T. S. (absence of sulphuric acid), calcium chloride T. S. (absence of oxalic acid), or ammonium oxalate T. S. (absence of calcium salts)." The tests for chlorides are based upon the readiness with which silver chloride is formed when glycerin containing a chloride is brought into contact with silver nitrate in diffused daylight. Acrolein is an irritating aldehyde which should not naturally be developed in a good sample of glycerin. Professor Coblenz, of the College of Pharmacy of the City of New York, says that if there be the least trace of acrolein in glycerin, it can always be detected by adding 1 C.c. of fuchsin (decoloured by sulphur dioxide), and if present the mixture will assume a purple

colour. By this method a trace of acrolein was found in each of the samples I analysed.

For the past few years it has been repeatedly stated that some samples of glycerin intended for pharmaceutical and medicinal purposes contained a sufficient quantity of arsenic to cause suspicion and alarm. That this fact was known to the manufacturer there is no doubt, but it is also true that he took great care not to enlighten the consumer on this most vital and important point. The arsenic in glycerin, like most other accidental impurities named in this article, has its origin in the re-agents used in the manufacture. It has been stated by good authority that distilled glycerin would not be contaminated with arsenic. A. H. Allen, in discussing the subject in the British Pharmaceutical Conference, at Leeds, in 1892, seemed to entertain some doubts about it, yet in his concluding remarks he distinctly states that it can be removed by distillation. Mr. Lewkowitch, in a recent article on glycerin, takes a different view of the subject. He says that arsenic exists in glycerin in the form of an arsenious ether of glycerin, $\text{As}_2\text{O}_3(\text{C}_3\text{H}_5)_2$. From experiments conducted by him, he finds that arsenic in this form distills over at 250°C ., the same temperature at which glycerin is distilled. If this be true, there is no practical process by which glycerin, once contaminated with arsenic, can be completely freed from it. Therefore, chemically pure glycerin, free from arsenic, is produced only when re-agents not containing it are employed.

With a view to ascertain what proportion of commercial glycerin was free from this poisonous drug, I examined all the samples I had, which were mostly of different manufacture. Seven of the samples contained comparatively large amounts. Two samples contained minute traces, which might be disregarded, while four were absolutely free from it. The method used for detecting arsenic was that introduced by Gutzeit, and now recognised by the Pharmacopœia. It consists in allowing the gas slowly eliminated by the action of sulphuric acid on zinc in presence of the liquid supposed to contain arsenic, to come in contact with three thicknesses of filter paper moistened with a saturated acid solution of silver nitrate. In order that sulphides which might be formed may not reach the filter paper, a plug of cotton or glass wool, moistened with lead acetate solution, is introduced into the mouth of the test tube. The presence of arsenic is shown by the production upon the paper cap of a bright yellow stain, which turns dark by the application of water. Vulpius, Flückiger, and Siebold employ a modification of this test. Vulpius and Flückiger substitute hydrochloric acid for sulphuric acid, and do not use the moistened plug of cotton. Siebold modifies the method just described by using instead of silver nitrate a solution of mercuric chloride. In the latter test a yellow spot will be the result of minute traces of arsenic.

To recapitulate, glycerin intended for medicinal purposes should be distilled once or twice. It should have a specific gravity of at least 1.25, and should be free from all metallic and organic impurities and adulterations.

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THE BRITISH PHARMACOPOEIA.

THE latest contribution to the series of articles in the *British Medical Journal*, on pharmacopoeial revision, is by Professor J. T. CASH, of Aberdeen, who deals with "The Criteria for the Admission of New Remedies." Of the principles involved in the process of selection, the first and most important is said to be embodied in the question, "Is the knowledge of a certain remedy sufficiently favourable and precise to ensure its accurate and reliable employment in the treatment of disease?" It is urged that only such substances must be added to the official list as have an established and ascertained position. Therapeutical and pharmacological observations should be the essential sources of a satisfactory guarantee, but in many cases the work of the chemist and botanist must also be considered indispensable. From the point of view of abstract principle, little exception can be taken to the opinion expressed by Professor CASH that it is not conducive to the accuracy of pharmacological research, or of treatment, that medical men should work with bodies whose constitution is not understood, or with those containing principles divergent or even antagonistic in their action. Neither is it advantageous when a new vegetable product is under consideration that any doubt should be left as to its precise botanical source. In other words, it is desirable to know exactly what is being dealt with and whence its supply is to be drawn.

But in the passage quoted an ideal condition of affairs is postulated, and however desirable its existence might be, it is far from being realised at the present time. Were a rule based on such lines to be strictly enforced, many articles of undoubted value would be banished from the Pharmacopoeia. Besides, it has yet to be proved that exact knowledge of the composition of medicinal substances renders their administration more satisfactory or that

it leads to more accurate results. The view put forward by Professor CASH is precisely what might be expected from a pharmacologist, and in that respect it is entitled to consideration. But it covers only part of the ground that must be surveyed in deciding what changes are to be made in the national Pharmacopoeia to meet the requirements of medical practice. The arguments brought forward on the ground of empirical experience, in favour of the retention of remedies and preparations which do not admit of a scientific explanation of their efficacy, cannot be ignored without producing a feeling of antagonism on the part of a large portion of the medical profession.

The paper read at the Liverpool Chemists' Association by Dr. CARTER, and published in last week's Journal, will serve as an apt illustration of the fact that therapeutical experience and pharmacological observations are not unfrequently at variance. However much some medical men may be inclined to agree with a strictly pharmacological view of the therapeutic use of remedies, there are many others who hold very different opinions and follow a very different practice. How much is known concerning the chemical constitution of cinchona bark, and why are better results obtained by its use than by the exhibition of definite chemical principles extracted from it? The effect, however, of such a rule as that suggested by Professor CASH would be to remove cinchona bark and its preparations from the official list of medicaments, whilst leaving quinine, cinchonidine, etc., to serve the same purpose, more or less effectively. Dr. CASH fortunately does not propose the adoption of any such rule, and the position he takes up generally is worthy of commendation. It is impossible to exercise too great care in deciding as to the fitness of a new remedy to become recognised officially, and, as Dr. CASH points out, other considerations than the main one present themselves before novelties are admitted into the Pharmacopoeia. Thus, it should be shown that there is a distinct necessity for their inclusion, that they are more effective than similar remedies already official, or that they are articles supplying a place not yet occupied.

SYNTHETIC FOOD.

In his retiring address as President of the American Chemical Society, Mr. H. W. WILEY considers the possibility of preparing human nutrient synthetically. After summarising the progress that has been made in the synthesis of organic compounds, he proceeds to criticise BERTHELOT's utterances regarding the coming suppression of agriculture and the substitution of synthetic foods for its products. BERTHELOT is said to hold that, even at the present time, tea and coffee could be made artificially if the necessity should arise, his arguments being based on the facts that

theine or caffeine is obtainable from theobromine, theobromine from xanthin, xanthin from uric acid, uric acid from urea, urea from carbonyl chloride and ammonia, carbonyl chloride from carbon dioxide and chlorine, and carbon dioxide from carbon and oxygen. In like manner he holds that tobacco may shortly be made because something resembling nicotine has already been made synthetically. According to BERTHELOT, the fields which are now defaced by agriculture will be beautified by regaining their natural covering; the earth will be one vast park of pleasure and the chemist the great conservator of the human race.

In all the instances brought forward, however, it is pointed out that there is not the slightest approach to anything to justify the prophecy of a period of artificial food. The few cases of synthesis in which the products approach the composition of anything digestible are said to present such insurmountable difficulties in expense and supervision as to render any expectation of reaching economic results apparently futile. In the great majority of cases, too, the process of synthesis is conducted on materials already organised by living cells, and the enormous cost of building up any kind of a commercial, synthetic body directly from the elements is such as to render its successful achievement, in Mr. WILEY's opinion, utterly improbable.

Finally, it is remarked that, even if food products could be formed in the crucible, Nature's laboratories are infinitely cheaper in construction and operation than those filled with platinum and porcelain. The sun ignites the crucibles of Nature at far less expense than attends the use of gas-works, whilst the director of Nature's laboratory depends on no endowment nor legislation for his salary, and his bills for supplies are not disallowed by any board of auditors on the score of economy. "Night and day his patient faithful assistants work without thirst for fame, without hope of reward. They fight not for priority of discovery, and their anonymous papers are printed in rich profusion in the great *Berichte* of the universe. The chemistry of the chlorophyll cell is far more wonderful than any of the achievements of LAVOISIER, BERZELIUS, or FISCHER."

STRENGTH OF COCAINE SOLUTIONS.

AMONGST the preparations which require careful consideration in the revision of the Pharmacopœia cocaine stands prominent. Five years ago it was not unusual in this country to meet with prescriptions for solutions of 10 per cent. strength to be used hypodermically. At the present time it not rarely happens that 5 per cent. solutions are required for this purpose. Yet we find much weaker solutions are in common use, and a 2 per cent. solution is now most frequently asked for. On

the Continent hypodermic injections of 1 per cent. are employed. Thus, a French surgeon, A. RICARD, writing in the *Gazette des Hôpitaux*, February, 1895, recommends a solution of this strength for injecting into the tissues to produce local anæsthesia in operations on the anus. SCHLEICH has found that in the skin 0.2 per cent. solution of cocaine produced anæsthesia without causing pain immediately after the injection. This solution is thus 100 times weaker than that most commonly employed in this country. This drug is of such common use that it is of importance to have a formula which will allow of its being kept ready for use in solution without fear of deterioration. Boric acid is usually employed for this purpose, but it probably makes the first injection more painful than it would otherwise be. SCHLEICH's formula is:—

Cocaine hydrochlor.	gr. ij.
Morphine hydrochlor.	gr. ½
Sodii chlor.	gr. iij.
Aq. dest. ad.	℥iii.
Ac. carbol. (5 per cent.)	℥ii.

This is for use on painful areas; for operations on healthy parts the cocaine is reduced to gr. iss. It is to be hoped that standard solutions will be fixed by the revising committee.

ANNUAL DINNER.

At a meeting held at 17, Bloomsbury Square, W.C., on Wednesday last, the President, Mr. MICHAEL CARTEIGHE, in the chair, it was decided to hold the annual dinner of the members of the Pharmaceutical Society and their friends at the Whitehall Rooms, Hôtel Métropole, on Tuesday, May 21 next, at 6.45 p.m. for 7 p.m. The President, Vice-President, Professor ATTFIELD, Dr. PAUL, and Messrs. ALLEN, BOURDAS, BUTT, FEAVEY, CLARKE, HILLS, HOPKIN, R. A. ROBINSON, TAYLOR, and WARREN will form the Committee, and Mr. RICHARD BREMIDGE, 17, Bloomsbury Square, was appointed to act as Honorary Secretary. The tickets (one guinea each) will be obtainable only from the Secretary, and it is desired that gentlemen willing to act as stewards will notify him to that effect as early as possible.

EVENING MEETING IN EDINBURGH.

AN evening meeting of the Pharmaceutical Society will be held at 36, York Place, Edinburgh, on Friday, March 22, at 8.30, when the chair will be taken by Mr. J. LAIDLAW EWING, Chairman of the Executive of the North British Branch, and the following paper will be read:—"Decomposition of Alcohol-Reduced Chloroform," by D. BROWN, and D. R. BROWN. A discussion on the proposed "imperial" pharmacopœia will take place subsequently; "Ointments" being dealt with by P. BOA, "Infusions," by W. LYON; "Pills," by J. I. FRASER; "Extracts," by W. SWAN; "Waters," by W. S. GLASS; "Linseed Meal," by A. J. DAY, and "Recent Criticisms," by T. MABEN; whilst "General Notes" will be contributed by J. B. STEVENSON and G. COULL. Recent additions to the museum will be exhibited by the Assistant-Secretary, Mr. J. RUTHERFORD HILL.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 13th inst., the Librarian and Curator presented the following report of donations to the Society's Library Museum, and Herbarium:—

To the Library (London).

- H. M. Secretary of State for India:**
Bellew's History of Cholera in India, 1885;
Bellew's Nature, Causes and Treatment of Cholera, 1887.
- Colonial Pharmacy Board, Cape Town:**
Medical and Pharmacy Register, 1894.
- Pharmacy Board of Victoria:**
Pharmaceutical Register for 1894.
- University of Durham:**
Calendar, 1895.
- Royal College of Physicians of London:**
List, 1895.
- Mr. H. Halbing, London:**
The Physiology and Therapy of Ichthyol, 1895.
- Dr. E. B. Squibb, Brooklyn:**
Ephemeris of Materia Medica, vol. 4, no. 3.
- Mr. J. Thin, Edinburgh:**
Scoresby-Jackson's Note-book of Materia Medica, 5th ed., 1895.
- Dr. F. Peckel Möller, London:**
Cod-Liver Oil and Chemistry, 1895.
- Herr E. Diesterich, Helfenberg:**
Helfenberger Annalen, 1894.

To the Library (Edinburgh).

- Pharmacy Board of Victoria:**
Pharmaceutical Register for 1894.
- Dr. E. B. Squibb, Brooklyn:**
Ephemeris, vol. 4, no. 3, 1895.
- Mr. J. Thin, Edinburgh:**
Scoresby-Jackson's Materia Medica, 5th ed., 1895.
- Dr. F. Peckel Möller, London:**
Cod-liver Oil and Chemistry, 1895.
- Mr. James Jack, Arbroath:**
Journal of Botany, 1891-94, 4 vols.

To the Museum (London).

- Messrs. Cross and Bevan, London:**
Specimen of Anise bark, and of a supposed Quinine bark from Madagascar.

To the Herbarium (London).

- Professor C. Hausknecht, Weimar:**
Specimen of *Ferula rubricaulis*.

To the Museum (Edinburgh).

- Mr. J. Seekirk, Cork:**
Set of Chinese Medicine Jars.
- Mr. J. O. Pottage, Edinburgh:**
Root of *Eryngium aquaticum*, Eryngo Comfits.
Powdered West African Kola Nuts, South American Maté, Persian Orchid Roots, Powdered Persian Orchid Roots, Powdered German and English Orchid Roots, used for Salep.
- Mr. A. Sutherland, Edinburgh:**
Asbestos from Unst, Shetland.
- Messrs. Duncan, Flochart and Co.:**
Magnesium Ricinoleate, Quinine Acid Hydrochloride, Artificial Methyl Salicylate, and Oil of Gaultheria.

EVENING MEETING IN LONDON.

The fourth Evening Meeting of the Session was held on Wednesday, the 13th inst., at 8 o'clock, Mr. Michael Carteighe (President) in the chair.

The first paper read was on "Standardised Preparations of Belladonna," by Mr. R. A. Cripps, F.I.C. It is printed at p. 793, and gave rise to the following discussion—

Mr. MARTINDALE said he could not quite agree with the line Mr. Cripps had taken, in producing a preparation which represented two parts by weight of the root in one part of the fluid extract. That seemed to be going in the direction of pharmacy made easy, which he did not agree with, as it would lead to retailers simply obtaining from wholesale houses one article from which to make all their preparations. That sort of thing was done to a great extent in America, and tincture of nux vomica became little more than a solution of strychnine. The pharmacopoeial tincture of 1 in 20 was absurdly weak; a tincture of a plant should represent conveniently a spirit solution which should reasonably exhaust the drug without waste of material, and the present weak tincture would probably give way to something stronger, or to a fluid extract, though he doubted whether it would be such a fluid extract as Mr. Cripps suggested. At Chicago there was a debate on normal percentage fluid extracts, and it was then generally agreed that 1 in 1 was too strong, and that a 1 in 2 preparation would be much more suitable for general purposes, but then it was suggested that the manufacturers would put an article on the market double the strength and beat the ordinary pharmacist. It was doubtful whether in many cases a 1 in 2 preparation could be made which would represent the whole activity of the drug. Mr. Groves told him that a preparation ought to, as far as possible, exhaust the drug, but he would not say it was possible for it to equal the whole medicinal activity. It was not necessary to completely exhaust the drug, and in many cases it would be waste of time and material to attempt it. A 2 in 1 preparation he should imagine would be too concentrated to contain the whole medicinal activity. From a great many experiments made during the last year he found the total alkaloids contained in belladonna leaves averaged .5 per cent., which pretty well agreed with Mr. Cripps' results from the root. One advantage in using the leaves was that you did not kill the goose which laid the golden eggs, as you did in digging up the root; on the other hand, there were many advantages in using the root especially for liniment and plaster, though it lacked the green colour which some liked, but which he did not. He thought there was on the average about 3 per cent. alkaloid in extract made from the root, and about 2 per cent. or a little under in that made from the leaves.

Mr. O. UMNBY said Mr. Cripps had done good service in collecting the results of so many experiments on belladonna. Much as he should like to see a 4 per cent. solid extract of the root, he did not think it would be possible to obtain it in practice,

except occasionally, and therefore the solid extract should be fixed at 8 per cent. The average of his work on large quantities was about 3.2. In the fluid extract a convenient standard would be 1 per cent., though he should have liked to see the solid extract double the strength of the fluid, as a matter of symmetry. With regard to making the tincture from the root instead of the leaves in future, it was necessary to proceed with caution, as medical men were accustomed to prescribe pills made from the green extract, and with doses of about double what would be ordered of the alcoholic extract. With regard to English and foreign roots, he had lately worked on about four tons of English roots, and the percentage of alkaloid was rather better than foreign roots, but he was not prepared to say that if the latter were more carefully collected they would not be of equal value; they generally had pieces of stem attached, which of course lowered the percentage. He had on examination shown how nearly English roots agreed: one sample from Brighton gave .44 of alkaloid; one grown by Mr. Holmes .48; some grown in Germany only gave .30. But there was no reason why roots grown in Southern Europe, and large quantities were shipped from Trieste, should not be as good as English. He did not like using sugar of milk as a diluent in such a case as this, as with a powdered extract of this potency you were dealing with a very sharp edged tool.

Mr. GERRARD said the present belladonna plaster was a very unsatisfactory preparation; if made with real alcoholic extract, as it was intended to be, and of the strength given, and applied to a person's back, the consequences would be serious. The plaster generally made now was prepared probably from a proof spirit extract, and he hoped this point would be attended to in the new pharmacopœia. When the alcoholic extract was made with alcohol of say 84 per cent., it separated after a day or two into two portions, and on that ground alone was unsatisfactory, though he did not know whether the upper or lower portion was most active, though he thought it probable the upper portion was more inert, and consisted largely of chlorophyll substances; there was always a little of this in alcoholic extract of the root which could be extracted by washing with ether. Another preparation largely used was glycerin of belladonna, which he had had to prepare by the half hundredweight; it was always made with the green extract, and he considered it unsatisfactory; it was applied in such large quantities that he could not but think it must be very weak, and it was very uncleanly. He was glad to hear that Mr. Cripps recommended the titration method for the alkaloidal residue, in addition to weighing.

Mr. J. C. UMNEY said his attention had recently been called to the separation of the alcoholic extract made with 84 per cent. spirit into two portions. On examining it, he found that the more liquid part contained 7.7 per cent. of total alkaloids, instead of between 3 and 3.25, which was the figure for the whole extract mixed together. Thinking he must have made a mistake, he repeated the experiment, and found 7.8, so that there was no doubt about this sepa-

ration making a great difference in the potency. With regard to the peculiar effect sometimes produced by belladonna, he held it was due to an idiosyncrasy of the patient rather than to any difference in the strength, owing to its being made from the root rather than the leaves, because he had recently to examine a plaster which had produced blistering, and it was made from leaves and contained only 1.8 per cent. total alkaloids.

Mr. J. C. UMNEY said he had often had complaints about belladonna plaster producing blistering, and he had formerly been under the impression that it was in consequence of the plaster being made from the root, but the instance just mentioned by his son convinced him that it was not so.

Mr. GERRARD said it was well known that atropine preparations, when applied to the skin, would produce what was called "belladonna rash," and he believed the effect referred to was due mainly to the atropine.

Professor ATTFIELD said he was there to learn rather than to contribute anything to the subject of the standardisation of drugs, and he must say he had learned a good deal both from the paper and the discussion. There could be no doubt that the next pharmacopœia would have to include a large number of standardised alkaloidal preparations. They could not go on using tinctures, extracts, fluid extracts, and various preparations containing highly variable proportions of mixed alkaloids. Then came the question what should be standardised, and what methods should be adopted. There was also the objection of men who said they did not believe much in preparations which contained such a number of constituents, and they preferred to use the pure alkaloids. Such men, of course, must prescribe accordingly, but the vast majority of practitioners used galenical preparations, and their interests must be met by standardisation where possible. They could not hope to have a perfect method of doing so; it was obviously impossible to do with many of these things as with arsenic or mercury, *i.e.* make a definite percentage solution, because they were not dealing with definite substances. All they could do was to fix their minds on a particular alkaloid known to be the chief active principle, ascertain how much was present in the raw material, and decide how much should be in the preparation, and then find out the best way to ascertain the proportion of that alkaloid in a given galenical substance. If they could not do that they must be content to deal with the total alkaloids. It was not because they had not as yet perfect knowledge that they were to do nothing. Then came the question, How much should be attempted? They must improve on what had been done for cinchona, opium, and nux vomica, and he did not see why they should not have standardised preparations of hemlock, henbane, stramonium, jalap, belladonna, and ipecacuanha. He did not think they were as yet in a position to include aconite, but there were about ten, and there might be some others which might be standardised.

Mr. CRIPPS, in reply, said he did not think Mr. Martin-dale's objection to "pharmacy made easy" would apply. A very large number of pharmacists would be very

glad to standardise preparations of belladonna, nuxvomica, and so on, but it was impossible to do so when they only made small quantities; but if they could buy or make one preparation, like the liquid extract, from which they could prepare all the others, they could standardise that for themselves, and this would operate against buying things in a slipshod way. As to the strength of 2 in 1, he had made it without differing from an average strength root, but he could not yet speak as to its keeping properties. He would admit that there were many drugs in which a 1 in 1 fluid extract would be an impossibility, and in some cases 1 in 2, but in the case of belladonna it was quite easy. This preparation contained about 90 per cent. of the alkaloids in the drug, which was quite strong enough, and the remainder could easily be recovered working on a large scale. As to the waste of material, it was as long as it was broad; if you had 10 grains of alkaloid in a given quantity of drug, it did not matter whether you made a gallon of tincture or an ounce of extract, the absorption of spirit by the given weight of drug would be the same, and the actual loss of spirit was very small. As to foreign roots, he thought Mr. UMNEY must have had a bad parcel, as had happened to himself, both with foreign and English. He had examined a good many foreign samples, and found over 7 per cent. After what had been said as to the difference in strength of the two portions of the alcoholic extract, it was a serious question whether such an article should be allowed to remain in the Pharmacopœia. He had heard a good deal from time to time about the blistering effects of belladonna plaster, and agreed that it was due to idiosyncrasy; he had once examined a plaster which produced this effect, and found it rather weaker than usual. He had tried washing with ether, as Mr. Gerrard suggested, and found that it removed a good deal of the alkaloid.

The PRESIDENT, in moving a vote of thanks to Mr. Cripps, remarked on the great increase in the demand for preparations of belladonna since the use of the root had been introduced. He thought there could be no doubt that the introduction of standardised preparations was to the advantage of pharmacists from a business point of view.

The next paper was on "*Empleurum serrulatum*," by Mr. J. C. Umney. This is printed at p. 796, and gave rise to the following discussion:—

Mr. HOLMES said his attention was called some time ago to an oil of buchu which contained diosphenol to the extent of 80 to 40 per cent., and thinking it would be interesting to know whether this substance had any medicinal properties, he sent some to Dr. Cash, who reported that on trying it in cases of vesical catarrh it had the same effect as buchu itself. It appeared, therefore, that those leaves which contained this substance should be used in preference to those which did not.

Professor ATTFIELD asked if Mr. Umney would recommend as the result of his investigations that *B. serratifolia* should be excluded from official recognition, and the other two retained, or as Mr. Holmes

hinted, that only one variety should be recognised.

Mr. MARTINDALE said he always preferred the *B. serratifolia*, as it contained more mucilage.

Mr. HOLMES said, according to his experience, the *B. betulina* was most frequently met with in commerce. Whether *B. crenulata* contained diosphenol he could not say.

Mr. C. UMNEY said he well remembered Mr. Daniel Hanbury having a large quantity of the essential oil made, which he examined, and he believed it was from that sample the experiments were made which were described in the 'Pharmacographia.' The *B. serratifolia* only came into the market occasionally, as a rule, but just now the market was flooded with it. The *crenata*, or *betulina*, was mostly sold. The price varied from 6d. to 2s. a lb.

Mr. J. C. UMNEY said he did not know until that moment of the result of Dr. Cash's experiments, but there was no doubt there was a difference between the *B. betulina* and *serratifolia*, the latter yielding no diosphenol whatever, while the former gave 80 to 40 per cent.

Mr. C. UMNEY said he believed the lance-leaved variety was richer in mucilage, and was valued on that account.

The PRESIDENT proposed a vote of thanks to Mr. Umney, which was carried unanimously.

Mr. DURHOLDT then exhibited an automatic still, which is described on p. 99 of this week's Epitome. Reynolds and Branson's "Bandage-shoot" and "Pill-box-shoot" were also shown.

Proceedings of Societies in London.

BRITISH PHARMACEUTICAL CONFERENCE.

A meeting of the Executive Committee was held at 16, Bloomsbury Square, on Wednesday, March 6.

Present:—Mr. N. H. Martin (President), Messrs. Carteighe, Hayes, and Umney (Vice-Presidents), Mr. Moss (Treasurer), Mr. Bird, Messrs. Naylor and Ransom (Hon. Gen. Secs.), and Mr. Nightingale (Asst. Sec.).

Letters were read from Messrs. Atkins, Martindale, Reynolds, Ewing, Wells, Farr, and Holmes, regretting their inability to be present.

The minutes of the previous meeting were read and confirmed.

Reference was made to the death of Professor Flückiger, and on the motion of the President, seconded by Mr. Carteighe, a resolution was unanimously passed expressing the regret that the Committee felt at losing so distinguished a honorary member of the Conference, and the Secretaries were requested to forward a copy of the same to Frau Flückiger, expressing sympathy with her in her bereavement.

From a statement received from the Treasurer, it appeared that the subscriptions indicated some falling off in membership, and considerable discussion ensued as to the best means to be adopted to obtain an increase in the number of members, and to improve the financial condition of the Conference. It was finally

decided that a special circular should be drawn up by the President and Hon. Secs. and addressed to the members of the Conference, urging upon them the necessity of individual effort to obtain candidates for election.

By a unanimous vote, Mr. Louis Siebold, F.I.C., F.C.S., was re-elected editor of the 'Year Book.'

The Treasurer and Hon. Secretaries were requested to revise the 'Blue List' and make any alterations that they deemed necessary.

Eight gentlemen, having been duly nominated, were elected to membership.

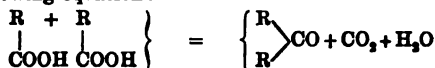
CHEMICAL SOCIETY.

A meeting was held on Thursday, March 7, the President, Dr. Armstrong, F.R.S., in the chair, the following papers were read:—

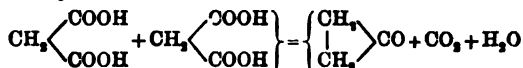
DIMETHYL-KETO-HEXA-METHYLENE.

BY DR. KIPPING.

The author has previously shown* that the higher fatty acids of the $C_n H_{2n} O_2$ series can be readily transformed into ketones by the action of phosphoric anhydride, the reaction taking place according to the following equation:—



If, however, a dibasic acid were used a ketone of a methylene derivative would be obtained—

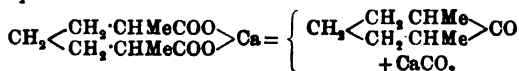


Experiments were made with dimethylpimelic acid with the hope of obtaining the corresponding ketone, which would be a dimethyl-keto-hexa-methylene. The acid, however, did not react with phosphoric anhydride in this way, so resource was had to other methods in the hope of obtaining this ketone.

It had been shown that when calcium salts of the higher dibasic acids of general formula $C_n H_{2n-2} O_4$ were distilled, similar ketones were obtained. By distilling calcium suberate, a keto-hepta-methylene was obtained, and Willcoens, by using adipic acid instead of suberic acid, obtained the keto-penta-methylene.

The author therefore converted the dimethyl-pimelic acid into the calcium salt, and then subjected this to dry distillation, when a brown oil was obtained having a strong odour of peppermint. The oil was proved to contain a ketone, and since it could not be crystallised, it was converted into the oxime, which was easily purified by crystallisation. The ketone was regenerated from the pure oxime by hydrolysis with hydrochloric acid. As thus obtained, the ketone is a mobile colourless liquid with a pure odour of peppermint, which is characteristic of these closed chain ketones.

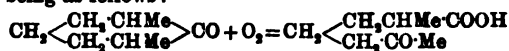
The reaction would be expressed by the following equation:—



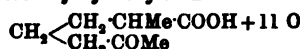
Calcium salt of
dimethyl-pimelic acid.

When the ketone was treated with nitric acid vigorous action ensued and oxidation took place, and as a final result a lactone was obtained and two other acids, which have not yet been identified. The oxidation may be supposed to occur in the following stages:—

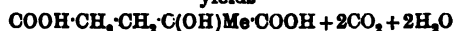
(1) The ketone becomes oxidised in the usual way to a keto-acid, the ring being broken, the equation being as follows:—



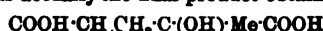
(2) On further oxidation the ketonic residue would be oxidised to the carboxyl group, and we should have a dibasic acid, and at the same time the tertiary carbon atom would become oxidised, and the hydrogen be replaced by hydroxyl. Thus:—



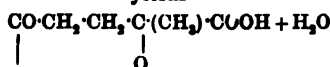
yields



(3) This acid, which would be α -hydroxy- α -methyl-glutaric acid, yields on evaporation the γ -lactone, which was actually the final product obtained.



yields



The final product of oxidation is therefore the lactone of α -methyl- α -hydroxy-glutaric acid.

THE USE OF BARIUM THIOSULPHATE IN STANDARDISING IODINE.

BY DR. PLIMPTON AND J. C. CHORLEY.

The advantages of using this salt are (i.), that it can easily be obtained pure and is of definite composition (ii.), and can be kept for a long time. It is best prepared by mixing hot aqueous solutions of barium chloride and sodium thiosulphate, when double decomposition occurs and barium thiosulphate is precipitated as a fine white powder, which is washed and easily purified. The water of crystallisation is not easily driven off, so it is necessary to heat it to 120° for some time before weighing as anhydrous salt.

It should not be drained by the pump or pressed between filter paper, but on drying in the ordinary manner forms a very light powder which mixes very easily with water, and during the titration it gradually disappears owing to the formation of the soluble tetrathionate. It is unnecessary then to add the starch till near the end of the reaction, and thus greater delicacy is obtained.

THE MAGNETIC ROTATION OF THE PLANE OF POLARISED LIGHT IN LIQUIDS.

BY J. W. RODGER AND W. WATSON, B.SC.

A new and improved apparatus for determining this constant was described, particular attention being paid to the influence of different temperatures on the liquid under examination. Special methods and precautions had to be taken to avoid errors, and these were described.

The following paper was taken as read:—"Trimethyl-succinic Acid," by Professor W. H. Perkin, and D. Bone.

* Journ. Chem. Soc., lvii., 532, 980; lxiii., 452.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

At the meeting on Friday, March 8, Mr. Alexander Sutherland, President, in the chair, the following papers were read:—

REPORT ON SPIRITUS ÆTHERIS NITROSI.

BY WALTER SMITH.

With a view to ascertaining what practical effect the many papers on this subject had had on the quality of the article as met with in commerce, the author had procured thirteen samples from various retail pharmacists, and determined the volume of nitrous oxide gas yielded by each in accordance with the official method. He had also examined three samples obtained from Mr. Hill, belonging to the series reported on by Mr. Meldrum in December, 1892. The results were as follows:—

	Volumes NO Yielded.	Remarks.
Sample 1 ...	15.5	
" 2 ...	13.5	
" 3 ...	12.5	
" 4 ...	23.0	Contained glycerin.
" 5 ...	11.7	
" 6 ...	12.3	
" 7 ...	28.2	
" 8 ...	35.0	Contained glycerin.
" 9 ...	31.2	
" 10 ...	30.0	
" 11 ...	13.5	
" 12 ...	32.0	
" 13 ...	30.0	
" 14 ...	0.0	
" 15 ...	5.0	5 per cent. glycerin.
" 16 ...	20.0	10 per cent. glycerin.

It therefore appeared that only six out of the thirteen samples were above the minimum official strength of twenty-five volumes; while one was slightly under, and the remaining six all far below it. Of the three obtained from Mr. Hill No. 14 was made according to the official formula, and in 1892 yielded 37.3 volumes. No. 15 contained an addition of five per cent. of glycerin, and yielded 38.4 volumes; No. 16 contained ten per cent. of glycerin, and in 1892 yielded 38.8 volumes. It thus appeared that with five per cent. of glycerin the spirit was much better preserved than with spirit alone, and that with ten per cent. of glycerin the results were again much better than with five, but even the addition of glycerin did not appear to be an effectual preservative. These three samples had been kept stoppered and never opened since 1892. He examined the other samples for glycerin, and found it in two. One of these, No. 8, was full strength; the other, No. 4, was a little below the minimum. The foregoing results go to strengthen the view that this preparation should be deleted from the Pharmacopœia or that some better menstruum than rectified spirit should be used as a preservative.

The next communication was on—

ELDERBERRY JUICE AS AN INDICATOR.

BY W. B. COWIE.

Having seen the statement in 'Muters' Analytical Chemistry,' that elderberry juice is recommended by Dr. Hamilton as being the most universally useful indicator for alkalis, being green with them and red with acids, and is in much favour in the U.S.A., I collected a quantity of berries last autumn, and made a juice according to the note. I carefully neutralised the product and used it as an indicator, when I found that it was quite useless as it had very little colour, and but little or no change in excess of an alkali. It occurred to me that the pericarps might give a better colour, and having kept the refuse from the juice, I made a 1 in 5 proof spirit tincture from them, and obtained a rich red colour, which on being neutralised changed to reddish-brown. On using this as an indicator, I found that the colour reactions corresponded to those ascribed to the juice, viz., green with alkalis and red with acids. I have determined the B.P. mineral and organic acids, using it as the indicator and checking with methyl-orange and phenol-phthalein as indicators respectively, and the results were identical. Elderberry tincture forms an excellent indicator in the determination of acids, the change in colour is from red to green, and the end reaction is sharp and unmistakable. On the other hand, when used in the determination of alkalis, the change in colour—from green to reddish-brown, and finally red—is so gradual that the end reaction is very difficult to detect, and it is by no means a good indicator under these conditions. Elderberry tincture is therefore only useful as an indicator in the determination of acids, that is, when an alkali is used as the standard solution.

The next communication was on—

TYPES OF BRANCHING AND INFLORESCENCE.

BY W. B. COWIE.

By means of a series of diagrams the author gave an interesting and very clear description of the different varieties of branching and inflorescence, showing how these were related to the division and subsequent development of apical cells.

The reading of the papers was followed by a discussion, taken part in by Messrs. Cowie, Hill, Lothian, Macpherson, Robertson, Smith, and Sutherland, and on the motion of the Chairman, votes of thanks were awarded to the authors.

Reviews and Notices of Books.

THE NATURAL HISTORY OF PLANTS. By KERNER and OLIVER. Part 11. Price 2s. 6d., nett. (Blackie and Son, Limited, London.)

This part of Kerner and Oliver's valuable work deals with various pollination processes, and fertilisation and the formation of fruit in Phanerogams. This interesting part of the subject is treated very fully and in a masterly style, whilst the numerous well-drawn illustrations are adapted to illustrate the text in a highly satisfactory manner. The coloured plate in this part is a brilliant representation of Alpine flowers in the Tyrol.

TWENTY-FIFTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH, MASSACHUSETTS. Pp. 812. (Boston, U.S.A., 1894.)

The work of Dr. Drown and his colleagues for the Massachusetts Board of Health is so well known in this country, that each annual report issued by the Board is looked forward to with interest by all chemists who follow the progress made in sanitary science from year to year. The present volume is fully equal to its predecessors in interest, for although it contains little novelty in the methods of analysis, it will be found of value as giving much information as to the filtration of sewage and water which cannot fail to be of use to those working at these problems in this country. The results of six years' working at the Lawrence Experiment Station go far to establish the conditions which are essential for securing the continuous efficiency of sewage filters. Amongst these conditions not the least important seems to be that in order to effect the purification of sewage by intermittent filtration, it is essential that the sewage should be intermingled in the pores of the filtering material with sufficient air for a sufficient time. Under such conditions the bacteriological purification of the sewage proceeds rapidly, and in this respect sewage filters resemble complex living organisms, since to ensure efficiency and vitality, ventilation and respiration must be maintained. The question of filtration of water occupies a considerable portion of the report, and in this connection it is interesting to note that in Massachusetts, at any rate, it is fully realised that one of the chief objects of water filtration, in most cases, is a removal of the disease-producing germs. The experiments carried out during the year show that the frequency of scraping increases with the fineness of the material and as the available head decreases. Intermittent filters under the existing methods of operation require scraping less frequently than the continuous filters of the same construction, owing chiefly to a disturbance of the surface sand by the air which is driven from the pores of the filter.

In a memoir on the amount and character of organic matter in soils, Dr. Drown has collected some valuable information on its bearing on the storage of water in reservoirs. Waterworks engineers do not in this country pay sufficient attention to this point, and frequently a town supply deteriorates in quality, so far as the organic matter is concerned, through neglect in making a preliminary examination as to the amount of subsoil it is necessary to remove before allowing a water supply to pass into a new tank or reservoir. Dr. Drown fixes as a provisional standard 1.5 to 2 per cent. of organic matter, as determined by the loss on ignition of the sample dried at 100° C. as the permissible limit of organic matter that may be allowed to remain on the bottom and sides of a reservoir. Dr. Abbott, the Secretary to the Board, contributes a useful paper on isolation hospitals for infectious diseases, in which he gives a valuable summary of the conditions which obtain in various countries in which progress in this particular direction for preventing the spread of infectious diseases has been made during the last few years.

A PHYSIOLOGICAL DISCOVERY IN CONNECTION WITH THE CIRCULATION OF THE BLOOD. By F. D. FISHER, Pharmaceutical Chemist, Grantham. Pp. 7. Privately printed.

A perusal of this tract leaves on the reader's mind only one clear fact, namely, that the author has been ill: "I had for some months been under medical treatment for the removal of biliary concretions from the gall-bladder and bowels, part of which treatment consisted of rubbing and massage of the abdomen, which I conducted personally; whilst doing this the tips of my fingers were rendered extremely sensitive, and I became, and am still, able to distinguish by the touch, conjoined with internal sensations, the rapid passage of matters, varying in consistence from time to time, through the whole course of the colon until it joins the rectum." And again: "I have, on one occasion, had for a short time complete paralysis of the left arm, which I could distinctly refer to obstructing matters in the colon and higher bowels."

Many discoveries when first disclosed have seemed to the world to be but symptoms of bodily, chiefly cerebral, derangement, and yet in the end they have proved to be true. Whether or no Mr. Fisher's "discovery" is a symptom or a reality, it is impossible even to surmise, because, for want of a familiarity with anatomical and physiological terms, the description of the observations on which the author founds his views is as yet incapable of being interpreted, and so it is impossible to criticise it. In true Baconian spirit Mr. Fisher has applied experiment to test his theory (whatever this may be). "I have recently had under examination the livers of a sheep, with a large part of the diaphragm attached to them." Thus the author has added a great discovery in anatomy to his physiological triumph. Up to the present time it has been believed that a sheep had but one liver, like the rest of the Vertebrata. Perhaps if Mr. Fisher could spend a year or two in the study of anatomy and physiology he would be in a position to do himself justice in giving his views intelligible form, and showing their relation to established facts of physiological science. It is probable that such a course of study would enable the author to feel the truth of the old saying, *Ne sutor supra crepidam*. To conclude, the hope may be expressed that Mr. Fisher has by now recovered his health and lost all abnormal sensitiveness.

A MANUAL OF VETERINARY THERAPEUTICS AND PHARMACOLOGY. By WALLIS HOARE, F.R.C.V.S. Pp. 560. 10s. 6d. (London: Baillière, Tindall and Cox.)

Although it is abundantly in evidence that this book is the production of a master hand, it is to be regretted that its publication has not been delayed to afford a sufficient time for the author to have eliminated the imperfections and supplied some of the omissions, that must detract in no small degree from its value as a text-book for the student and as a reference book for the more advanced practitioner in the science and art of veterinary medicine. As an illustration also of the desirability of a more complete and perfect index the reader does not get

beyond page 9 without the want of it being brought conspicuously under his notice. A paragraph printed upon this page, referring to pain as a prominent symptom in a variety of affections, states by way of illustration that "it occurs in simple colic, in enteritis, in peritonitis, in volvulus, in affections of the stomach, and also in pleurisy, nephritis, &c." Upon turning to the index with a view of localising this manifestation of pain as a help to diagnose and differentiate between these various ailments, the aspiring student will find to his astonishment and regret that neither peritonitis, volvulus, pleurisy, nor nephritis is to be found therein.

It is, however, more especially in part 3 and in the appendix on Veterinary Pharmacy that this book requires a careful revision. It is palpably incorrect to describe colocynth pulp as the dried fruit of *Citrullus colocynthis*. Oleate of mercury is something more than a mixture of yellow oxide of mercury and oleic acid. Sodii bicarbonas is not prepared by saturating carbonate of potassium with CO_2 . Lin. tereb. alb. does not require the addition of aqua q.s. to convert it into a fluid emulsion. Borax dissolved in water for use as a gargle does not make an astringent gargle. These illustrations may be taken as typical of others that are only too prominent.

New remedies and their doses are fully in evidence; the results obtained by the use of some of them are commented upon. Antipyrine very much takes the place of our older friend, antimony. Antim. tart. is said to be only occasionally prescribed in veterinary practice, and it is further stated that it is difficult to understand how it can be of any therapeutical value. Myrrh is dismissed in two lines; it is no longer associated with its old congener, aloes, or considered to possess any veterinary value in the form of tincture. In concluding this notice the especial attention of the reader is directed to Chapter VII. in part 3, p. 336, dealing with anæsthesia and anæsthetics, which is eminently praiseworthy, and does honour to the book, to the author, and to the modern humanitarian practice of veterinary medicine.

LES DROGUES SIMPLES D'ORIGINE VÉGÉTALE. Par MM. G. PLANCHON and E. COLLIN. Tome première, avec 626 figures dans le texte, la plupart originales. (Paris: O. Doin. 1895.)

The object of the present extensive work appears to be to combine the classical 'Histoire des Drogues Simples,' of Guibourt, with the 'Traité Pratique de la Détermination des Drogues Simples.' The former was an excellent treatise on the commercial drugs of all countries, and was arranged according to the natural orders. In the second the drugs were classified under the different organs of the plant, and it was a most useful handbook for students.

But in order to obviate the inconvenience to students of referring to two distinct works arranged in a different style, Professor Planchon conceived the idea of combining the two works in one, or, in other words, of introducing the histological or anatomical and chemical knowledge of drugs that has been acquired during the last fifteen years or so into the old

'Histoire des Drogues,' so as to bring it up to date in pharmacognosy. This work is intended, according to the authors, to form a *résumé* of the "Cours professé" at the École de Pharmacie de Paris. The wisdom of this plan seems somewhat doubtful. The present volume, which is only the first part, is about the size, or rather larger than, one of the volumes of the original edition of Pereira's 'Materia Medica,' and the entire work will not only be far too cumbersome for use as a student's handbook, but the enormous number of drugs mentioned in it are likely to bewilder the pupil, since there is no distinction drawn, by printing in different type, between the important drugs and those which are little used or rarely seen in pharmacies, even in France. If the latter had formed an appendix at the end of each chapter, they might have rendered the labour of the student and the tax on his memory very much less. The space occupied by them might also have been utilised in giving details of the different qualities and adulterations of drugs, which are neglected, except in a few cases. Of the history of the drugs, or the conditions of climate, soil, and situation in which they grow, practically nothing is stated, nor of the ports whence they come. Moreover, the work is essentially a French one, i.e., whenever the information given is fuller than usual, it relates to the products of French colonies and must be taken to indicate, in all cases, the varieties of drugs met with in the French drug market. Foreign journals or works on materia medica do not seem to have been consulted, or to a very limited extent.

The progress that pharmacognosy has made in the direction of pharmacographic histology has been fully recognised throughout the work. At the commencement of each chapter a brief summary is given of the chief anatomical details characteristic of the genera treated of. The structure of nearly every drug is described in detail, and the description accompanied by one or more illustrations. The descriptions are, as a rule, minute and accurate. It is to be regretted that in the illustrations a lack of discrimination between the important and unimportant makes itself felt. It may reasonably be assumed that one of the principal objects in illustrating a work of this description is to convey to the reader an accurate conception of cells and tissues that are of diagnostic value or scientific interest; this is precisely what, in many cases, the figures fail to do. For instance, in the case of willow bark (p. 255), oak bark (p. 259), and strychnos bark (p. 663), the attempt has apparently been made to represent an entire section, from cork to cambium; consequently, the scale of magnification must be low, detail is lost, and tissues that are characteristic become inconspicuous or even undistinguishable.

These instances are by no means exceptional nearly all the drugs are treated in a similar manner. The illustrations of powdered drugs might in some measure have supplied this want, but they, unfortunately, are drawn to so small a scale and are so badly printed as to be practically useless, and the reader is, in great measure, dependent upon the text for an

explanation of the histological details. Whilst the student must admire the patience and industry which M. Collin has evidently devoted to the drawings, he will with difficulty restrain a feeling of regret that he has not availed himself of illustrations equally accurate and far more elegant, intelligible, and instructive, that have appeared in the literature of the subject during the past ten years.

It is also to be regretted that the authors have followed the growing practice, of not acknowledging the source of drawings that are not original. Those, or at least the majority of them, in the section on Cryptogamic botany, have evidently been copied from Baillon's excellent '*Traité de Botanique Médicale Cryptogamique*,' and some from earlier works. The reader then begins to wonder how many of the subsequent drawings are copied, and how many are original. But there is time to improve the second volume, and it may be hoped that, in a work which is intended to occupy so important a position, the authors will consult the literature that has been published in other countries, and exhibit less of the insularity, so to speak, which our neighbours conceive to be our own special peculiarity.

Correspondence.

THE BRITISH PHARMACOPOEIA.

Sir,—In your note to my letter in the *Pharmaceutical Journal* of the 9th inst., you neither substantiate nor retract the charges you have brought against me in your leader. You are, I think, bound in fairness to do either the one or the other.

T. LAUDER BRUNTON.

. We regret that Dr. Lauder Brunton should regard our comments as charges against him, but think it undesirable to enter into a discussion of our different opinions.—[*Ed. Pharm. Journ.*]

DETERMINATION OF LIQ. MAG. CARB.

Sir,—With reference to the volumetric determination of liq. mag. carb., mentioned in Mr. Lunan's interesting notes on pharmacopoeial revision, I would suggest the use of methyl-orange as an indicator, if such has not been suggested already. Being unaffected by carbonic acid, the determination can be done in the cold. Its inclusion in the B.P. appendix, together with rosolic acid, might be useful. In the U.S.P. the most suitable indicator is given in each estimation.

J. G.

A CORRECTION.

Sir,—In your notice of my paper in last week's issue I observe an error which I think ought to be corrected. The diameter of the supply-tube of the filter is given as $1\frac{1}{4}$ inch instead of $\frac{3}{4}$ inch, and the exit-tube should be $\frac{1}{4}$ inch diameter. As this is apt to be very misleading, especially in the absence of the illustrations, I trust you will oblige me by kindly inserting this correction.

ALEXANDER GUNN.

THE STANDARD FOR SAL. VOLATILE.

Sir,—If Mr. Brayshaw will go through the calculation given on page 724, substituting 10.94 for 10.35, he will find that the total theoretical CO₂ from 5 C.c. of spirit, is 38.5 C.c., not 37.56 C.c. as he states. The standard I suggest is practically that of the present B.P., and I think the analyses given show it is reasonable.

Birmingham.

J. F. LIVERSEYE.

SHOULD DOCTORS DISPENSE?

Sir,—May I be allowed to point out what seemed to me to be errors in E. Camden Taylor's letter which appeared in the issue of the *Pharm. Journ.* for February 23. Your correspondent states that "a doctor's knowledge of drugs is not so large and extensive as that of a properly qualified chemist." I should like to know if your correspondent has ever seen their examination papers in botany and materia medica and compared them with the papers set for the Minor examination. If a doctor has not the knowledge of drugs possessed by a chemist, how can a doctor then prescribe those drugs? Your correspondent remarks that if a doctor wrote prescriptions instead of dispensing them, that he would have more time for visiting his patients. In reply to this I may state that a doctor who dispenses takes care to have his drugs in an easily dispensed form. E. Camden Taylor makes use of a peculiar remark to the effect that if doctors wrote prescriptions, and paid more attention to visiting, that patients would be more satisfied. Is it likely that a patient would place more reliance on a chemist than a doctor? In fact, many people prefer a doctor to dispense than to prescribe.

Manchester.

CHARLES E. WHITTAKER.

THE MAJOR EXAMINATION.

Sir,—The suggestion of "M.F.C.S." in your issue of March 2, re "Major qualification, etc.," is worth consideration. There are doubtless many Minor assistants and proprietors of businesses, who for various reasons have been unable to take the Major diploma, who would cheerfully work up for it if your correspondent's suggestions were accepted. To such candidates the fee might be raised to the original sum of £5 5s. 0d., payable in instalments of, say £3 8s. 0d. for chemistry and physics, and £1 1s. 0d. each for materia medica and botany. Most of the medical bodies allow candidates to present themselves for separate subjects, and thus many hard-working assistants are able to gradually work up for their diplomas whose prospects of qualification would otherwise be hopelessly barred. Although, personally, I have no interest in the matter now (having commenced the medical curriculum) I should still like to see it pushed forward and brought under the consideration of the Council.

AN ASSOCIATE IN BUSINESS.

Notices to Contributors.

. Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the *Journal*; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

COMMUNICATIONS received from Messrs. Brunton, Callis, Cloghorne, Cripps, Durrant, Goldby, Gunn, Grier, Hebb, Heibing, Hill, Holloway, Jones, Kirkby, Lunan, Naylor, Perry, Rose, Saunders, Sutton, Tallis, Thompson, Umney, Wilcox.

THE PHARMACOPŒIA TEST FOR PEPSIN.

BY C. D. MOFFAT.

ACCORDING to the definition given in the British Pharmacopœia, pepsin should be capable of digesting at least fifty times its weight of coagulated egg albumin when tested in the manner there directed. Since the issue of the present Pharmacopœia various forms of pepsin have been brought into the market, which are represented to possess a relatively much larger solvent power. The United States Pharmacopœia defines pepsin as being capable of digesting not less than 3000 times its weight of coagulated egg albumin when tested by the process described in that work. This process differs from that of the British Pharmacopœia in several particulars, and the question arises as to how far the difference in the solvent power of pepsin, as indicated by these two authorities, may be due to actual difference in strength or determined by the method of testing.

In order to obtain some information on this point comparative experiments were carried out with several samples of pepsin, which were tested simultaneously by the methods of both Pharmacopœias.

The first sample tried was represented as being capable of digesting 3000 times its weight of egg albumin, and, when tested in the manner directed in the U.S. Pharmacopœia, results were obtained confirming that statement. But when the same pepsin was tested according to the method of the British Pharmacopœia the result obtained was widely different, and the quantity of albumin dissolved was only 250 times the weight of pepsin used. This difference, which is attributable to the method of testing, shows that the solvent power of a sample of pepsin, as indicated by the process of the United States Pharmacopœia, would appear just twelve times as great as that indicated by the test of the British Pharmacopœia. In order to confirm this relation before proceeding further, two other samples of pepsin, which respectively claimed a digestive power of 1:3000 and 1:2500, according to the U.S.P. test, were tested according to that standard, and the solvent power was found to be but 1:1800 in each case. As these, however, when tested according to the British Pharmacopœia, both dissolved 150 times their weight of albumin, the first results were substantiated as the table below shows:—

	Claimed Digestive Power.	Found Solvent Power.	Found Solvent Power.
No.	U.S.P. test.	U.S.P. test.	B.P. test.
1	1:3000	1:3000	1:250
2	1:3000	1:1800	1:150
3	1:2500	1:1800	1:150

For reference the details of the B.P. and U.S.P. tests are tabulated in the next column.

The directions given in the U.S. Pharmacopœia are so precise that no misunderstanding can occur, but the following particulars as to the manner in which the B.P. test was carried out are desirable.

	B.P. Test.	U.S.P. Test.
Pepsin	2 grains	0.00335 gramme
Albumin	100 grains	10 grammes
Water	1 fluid ounce	100 C.c.
Acid Hydroch.	5 minims	0.2 C.c. real acid
Time	30 minutes	6 hours
Temperature ...	130° F.	100°-4-104° F.
Interval between agitations.....	No definite interval stated	Fifteen minutes

With the exception of one or two minor details this test is identical with that recommended by Benger (*Ph. J.* [3], vol. xii., 587), and it was found to answer admirably after several other methods had been tried and discarded; it will, therefore, be briefly described here. The water bath consists of a beaker (5 by 6½ in.), on the top of which is fitted a tin plate, with five perforations, which hold stout test tubes (1½ by 6½ in.), one of which contains the thermometer in 1 fluid ounce of water. The proportions of albumin, hydrochloric acid, and water were in all cases constant, the pepsin being the only variable quantity. This is much preferable to varying the albumin, which would entail a proportional variation of water and acid, comparative results not being then so readily obtained. Since many of the commercial pepsins are now soluble in water, and practically non-hygroscopic, it is most convenient when dealing with one of unknown solvent power to use an aqueous solution of definite strength, the amount of water thus employed being deducted from 1 fluid ounce, as prescribed in the B.P. test, so as to have the bulk of liquid in each case the same, and when examining an insoluble pepsin to dilute with sugar of milk. To ensure the albumin being in as finely divided a state as possible, it is preferable to pass it through the sieve a second time, as recommended by Mr. J. L. Bullock. One hundred grains is then thoroughly triturated with a small quantity of water in a mortar, and transferred to each test tube, particles of albumin adhering to the mortar being washed into the tube with the remainder of the water. Five minims of strong hydrochloric acid are added, and the tubes having been loosely corked and shaken are heated in the water bath until the temperature is constant at 130° F. The several quantities of pepsin are then added, and the tubes kept at this temperature for thirty minutes, each being shaken in turn so as to allow of an interval of five minutes between the individual shakings. At the expiration of the time they are immediately cooled to 60° F., and the quantities of undissolved albumin, if any, compared at once.

I have found the use of corks and shaking preferable to stirring with a glass rod, if due care be exercised, as there is less risk of breaking the tubes, and no difficulty is experienced in dislodging the particles of albumin from the tops of the tubes.

Everyone who has worked at this subject will have experienced some difficulty in getting a comparative reading of the albumin remaining undissolved with the requisite accuracy. This, I find, can be obviated by the addition of a few drops of an aqueous solution of roseine acetate to each tube after the period of digestion has terminated. By means of

the magenta colour thus formed, the relative portions of undissolved albumin are thrown into striking relief, and the boundary between complete and incomplete solution of albumin is accurately defined.

In fixing the solvent power of a pepsin, it is advisable in the preliminary test to use such amounts of pepsin in the four tubes that the relations to 100 grains of albumin may be as 1:50, 1:100, 1:200, and 1:300 respectively. A rough idea can thus be formed of its strength. Thus, if 1:100 has completely dissolved, whilst 1:200 has a considerable amount left, a further test is carried out in the proportions of 1:100, 1:125, 1:150, and 1:175 respectively, the first being useful for comparison. The second test will then determine the exact solvent power.

More than passing allusion to the absolute necessity of strict attention to detail in working at this subject, in order to obtain concordant results, is unnecessary, as this point has been previously sufficiently impressed. The fact having been established that the solvent power of a pepsin determined by the U.S.P. is twelve times as great as when tested according to the B.P. standard, some investigation of the conditions affecting this relation was necessary. These were as follows:—Acidity, time, temperature, amount of water, and frequency of agitation. The first was soon dismissed, as the B.P. proportion is practically the same as the U.S.P., i.e., 2 per cent. real HCl, and this has previously been shown to be the most favourable.

With regard to time, it was apparent that the proportion of 3000:250 represented numerically the time occupied by the two tests. Of course it was not likely that the relation was really one of time, as there were other conditions at work; still, to clear up this point, a test was carried out with pepsin No. 1 by the B.P. process in all respects, except that the proportion of pepsin to albumin was 1:3000.

The time occupied for complete solution was two hours only. It will be noticed that this test differs from the U.S.P. only in the interval between agitation, and the amount of water, which is proportionally about 2·3 times as much in the U.S.P. as in the B.P. The relations between it and the strictly B.P. test are here given.

	Proportion 1:250.	Proportion 1:3000.
Pepsin No. 1.	B.P. test.	"Time" test.
Pepsin taken.....	4 grains	0·033 grain
Acid Hydroch.	5 minims	5 minims
Albumin.....	100 grains	100 grains
Water.....	1 fluid oz.	1 fluid oz.
Time.....	30 minutes	2 hours
Temperature.....	130° F.	130° F.
Interval between shaking.....	5 minutes	5 minutes

The effect of variation in the intervals between agitation and the volume of water used was determined by performing two other tests with pepsin No. 1, in which the proportions of pepsin, acid, albumin, time, and temperature were the same as in both Pharmacopœias, the amount of water used being, however, the same as in the B.P. in each

case, whilst one tube was shaken every five and the other every fifteen minutes. At the end of six hours the albumin in the tube shaken every five minutes had just dissolved, but there was a considerable portion left in that shaken every fifteen minutes. From the figures given below it will be seen that the greater amount of agitation which the first tube received seems just to have balanced the fact that it contained proportionally less water than the U.S.P., as already mentioned.

Pepsin No. 1.	Albumin all dissolved.	Albumin not all dissolved.
Pepsin taken.....	0·033 grain	0·033 grain
Acid Hydroch.	5 minims	5 minims
Albumin.....	100 grains	100 grains
Water.....	1 fluid cz.	1 fluid cz.
Time.....	6 hours	6 hours
Temperature.....	100°·4–104° F.	100°·4–104° F.
Intervals between agitation.....	5 minutes	15 minutes

Several other brands of solid pepsin, both soluble and insoluble, were examined, and confirmed the above proportional results. In the table below are given the results of examinations of some standard makes of liquid pepsin, by the B.P. test.

Albumin.....	100 grains.
Water.....	1 fluid oz.
Acid Hydrochloric.....	5 minims
Time.....	30 minutes
Temperature.....	130° F.

With the above proportions and conditions the quantities of pepsin required to dissolve the albumin were as follows:—

No.	Quantity required.	Proportion of Liquid Pepsin to Albumin Dissolved.
4	1 fluid drachm	1 Pepsin : 1·6 Albumin
5	1 fluid drachm	1 " : 1·6 "
6	1 fluid drachm	1 " : 1·6 "
7	$\frac{1}{2}$ fluid drachm	1 " : 3·2 "
8	6·6 minims	1 " : 15 "
9	No definite results obtained.	—

With No. 6 but little solution of albumin was effected when in the proportion of 2 fluid drachms to 100 grains albumin, and on still further increasing the proportion of pepsin the solvent action on albumin correspondingly diminished. As the menstruum was found, however, to be largely composed of alcohol, it is probable that this had a retarding effect upon the reaction.

It will be noticed that throughout this paper the term "solvent power" has been used in preference to "digestive power," as only in isolated instances was the amount of peptone formed determined, and it would appear that for comparative tests it is unnecessary to proceed beyond the solvent power.

A few words, in conclusion, as to the relative utility of the pepsin tests of the British and United States Pharmacopœias. In spite of the elaborate nature of the latter, my experience of it is not of a satisfactory nature. An attempt has been made in it to carry out the test under conditions approximating to those at work in the human organism. But it is well to remember that we can never hope

to do this under absolutely natural conditions, and that pepsin testing is at the best but comparative. The six hours' test of the U.S.P. is tedious and unnecessary. It involves practically constant attention, and the results when obtained show no compensating advantages over a shorter test at a higher temperature.

The basis of the B.P. test, on the other hand, is workable, and although as it at present stands many loopholes are afforded for discrepancies in results, owing to the idiosyncrasies of different workers, when modified as suggested it will be found to constitute a test which is reliable and readily applicable, and when carefully performed under invariable conditions will be found to give constant results. The objection often brought against it, that the temperature at which it is carried on is above the blood heat, savours of the hypercritical, as for comparative tests this is of no moment. The modifications I should suggest are as follow :—

1. The standard should be raised from 1:50 to 1:250. From an examination of several makes of pepsin now in the market, it is evident that no difficulty will be found in procuring a pepsin which, under the B.P. conditions of time and temperature, will dissolve 250 times its weight of albumin.
2. There should be a definite interval of five minutes between the agitations. If the albumin be in a properly divided state to start with, shaking is preferable to stirring, since there is always some liability to breakage with the latter.
3. The albumin should be passed through the sieve twice. It will then be in the most favourable condition for the pepsin to exercise its solvent powers.

Generally, a more detailed account should be given as to the method of carrying out the test, as it is this want of detail which constitutes a large source of error in a test of this nature, where concordant results are impossible unless the tests are carried out under unvarying conditions. The other directions as to proportion of acid, albumin, water, time, and temperature, should remain unaltered.

BOTANY FOR PHARMACISTS.

LABORATORY EXERCISES IN BOTANY, designed for the use of colleges and other schools in which botany is taught by laboratory methods. By Edson S. Bastin, A.M., Professor of Botany and *Materia Medica* in the Philadelphia College of Pharmacy. Pp. 540. Illustrated. (Philadelphia, U.S.A. : W. B. Saunders, 1894.)

IN the present position of pharmaceutical education, a very considerable difficulty is often experienced by the student in selecting reliable textbooks from the number presented to him. This is unfortunately intensified in the case of the subject of botany by too general a tendency to regard as of subsidiary importance the exact principles of the science, and to lay especial stress on only its pharmaceutical application. The position demands, therefore, that new books, especially when they emanate from a College of Pharmacy, shall be carefully and critically scrutinised before being accepted as trustworthy works of reference for the student.

Regarded from this point of view, Professor Bastin's new work, though admirably got up and containing much that is valuable, must be pronounced as coming far short of present-day requirements. Reading carefully a good deal of the work, the reader is inclined to turn back curiously to the title page to see if the date of publication is not 1875 rather than 1895, so far are modern discoveries and recent views of structure ignored.

At the outset a very different impression is made; the book is said to have had its birth in the laboratory, and it emphasises strongly and clearly the desirability of studying structure from the plant rather than from books. So clear and definite is the teaching given on this head, that it appears as if it would constitute a most valuable aid to any student who might take it up and follow it. Much of its instruction also is good and sound; it shows the student how to investigate vegetable tissues, and teaches him what reagents to use in his practical studies, and what he may learn from the effects that they produce.

But it is when the author turns to actual botanical teaching a sense of disappointment comes over the reader, which intensifies as the subject is pursued. Morphology, anatomy, physiology, all alike contain inaccuracies and leave omissions, which must involve the unhappy student in uncertainty and confusion. The whole work is out of date, old views and modern work are frequently allowed to clash, and the discrepancies remain unexplained.

Criticising the author's morphology first, as this section is the first treated of, one may notice his treatment of the seed. As the fruit is stated to be the ripened pistil, so the seed is called the ripened ovule. A novice must conclude, and very naturally, that the changes in the pistil and those in the ovule are of the same nature, being defined by the same word. But what can be more misleading? Instead of a change chiefly chemical, and involving no morphological alteration, as in the first case, we have in the formation of the seed changes of vast importance both morphological and anatomical. So far from the ovule only ripening, it is the seat of development of the whole gametophyte, the alternate phase of the plant, of the formation and fertilisation of sexual cells, and of the origination of the development of the new sporophyte. In using the phrase "the ripened ovule," as defining the seed, the author is guilty of false morphology. The seed is, in fact, the young sporophyte, embedded in, or attached to, the gametophyte which gave it origin, and surrounded by the remains of the original macrosporangium in which the macrospore was formed. To call it a ripened ovule is to ignore the fact that the spore is a definite stage in the life history of the plant. If the phrase "ripened ovule" can be admitted at all, it must apply to it at the time when the spore or embryo sac has reached its full development, and before it germinates to produce the gametophyte.

In the description of the corona of *Narcissus*, the morphology given is at variance with the usually accepted ideas of leaf structure. This, like the scales in the corolla of caryophyllaceous flowers and the ligules of grasses, is said to be stipular in origin, though it arises as they do at the summit instead of the base of the petiole.

Adventitious and secondary roots are said to be the same, and the author holds that the branching of the root is generally without any definite order.

But it is in the section dealing with anatomy that the greatest errors are to be found. The most glaring of these is the reiteration of the old ideas of the structure of the bark, in both stem and root.

If anything in the structure of the axis has been ascertained more clearly than another by modern work, surely it is that the bark is a secondary formation, due to the development of successive cork layers in the cortex and bast of the stem, and generally in the pericycle of the root. Yet the author gravely puts forward the old views of corky layer, cellular or green layer, and liber layer of the bark, saying that all external to the cambium must be regarded as belonging to it. In describing the stem, on p. 496, he finds himself in the curious position of speaking of the middle or green layer, while saying that outside it is only an epidermis. Where are the other layers here? How can there be a layer properly called a middle layer, when no other layer is either outside or inside it? From the mode of its formation, bark is necessarily dry and dead. Yet the author describes the dandelion root as having a succulent bark, containing numbers of laticiferous vessels.

It would take too much space to criticise in detail all the erroneous statements in the book. There is an absolute silence about the theories of axial structure, which have now for some three or four years taken the chief place in modern text-books; the pericycle is not even alluded to, nor is the central cylinder or stele of the axis described as an anatomical region. The endodermis is dealt with as if it belonged to a vascular bundle and not to the stele, while the attempt to find a central cylinder in the stem of the fern, now recognised almost universally as polystelic, lands the author in a maze of difficulty. The anatomy of the root is represented as based upon a single vascular bundle with many rays, instead of upon a central stele with alternating separate bundles of wood and bast.

Where the author incidentally brings in physiological conceptions he is still more unhappy. He speaks of root hairs covering the whole surface of young rootlets, whereas they are confined to a definite portion. His interpretation of the structure of stomata and explanation of their mode of action, on page 322, may be quoted as a special instance of his looseness of reasoning. He admits that the outer surfaces of the guard cells are thickly cuticularised, and that only their radial walls (i.e., those abutting on the other epidermal walls) are thin. Yet he gravely says they take up water from the watery vapour of the air by their hygroscopicity! This is exactly what they do not do, the entry of water being always through the thin radial wall by osmosis from the other epidermal cells. Why on his theory are the guard cells supplied with chlorophyll when the rest of the epidermis has none?

It is a grave pity that a book like this should go forth to the average elementary student under the authority of a Professor of Botany and *Materia Medica*. It will do more to perpetuate the old errors than modern research has demonstrated to be such than it will good in directing students in the proper methods of study.

THE NITROGEN OF THE AIR IN RELATION TO PLANT LIFE.

In connection with the recently-established lectureship on agricultural chemistry in the University of Edinburgh, Dr. Aitken, who has been appointed to fill the office, took as the subject of his inaugural lecture that of atmospheric nitrogen in relation to plant life. He traced the history of this fascinating problem from the time of Priestley, a century ago, down to the present day, and noticed incidentally the work of De Saussure, Boussingault, Ville, Liebig, Lawes, and Gilbert, and Pugh, besides that of others who have contributed to the development of the question. Up to quite recent years no doctrine in plant physiology was more universally accepted than that of the entire inability of plants to assimilate even a particle of the great ocean of free nitrogen in which they grow; to-day not any one who has kept himself informed of modern research can doubt that some plants, at least, possess this power. It had been known for centuries that the growing of leguminous crops was a means of enriching the land in such a way that, after clover, vetches, or the like, an increased yield of wheat or other cereal crop could be obtained. It has in modern times been ascertained that the reason is that leguminous crops leave the soil richer in nitrogenous matter than it was before, and this, despite the fact that the leguminous crops themselves are distinguished above all other kinds of crops by the large proportion of nitrogenous matter entering into their composition. The success which followed the efforts of Herr Schultz, who in 1855 commenced growing so characteristic a leguminous crop as lupins upon poor light soil at Lupitz, in Germany, led him to classify his crops under the two heads of "nitrogen collectors," which embrace the leguminous plants, and "nitrogen consumers," such as the cereal crops. The results at Lupitz induced Hellriegel and Willfarth to begin the study of the problem from a biological point of view. The idea that micro-organisms were intimately associated with the growth of plants, and with the chemical processes favourable thereto taking place in the soil, had been made familiar by the ascertainment of the fact that the conversion of the nitrogenous matter of the soil into nitric acid was itself a process achieved by living organisms. This brilliant discovery was made by the French chemists, Schloesing and Müntz, who published their first report thereon in 1877. It has worked nothing short of a revolution in our methods of viewing the relations of the soil to plant life. From 1877 a new light has been shed upon the chemistry of the soil and of plant growth generally, and a biological as distinguished from a purely chemical method has been rendered available, by means of which such questions as the capacity of plants to assimilate free nitrogen may be investigated. The attention of Hellriegel and his colleague was attracted to the nodules which occur upon the roots of leguminous plants, which they found to contain minute organisms. This started them upon a line of experimental inquiry, the results of which, announced at Berlin in 1886, indicated that when cereals, on the one hand, and leguminous plants, such as clovers, beans, peas, on the other, are grown in sandy soil, to

which the requisite mineral manures are added and the nitrogenous matter is given in the form of nitrates, the cereals make growth and attain vigour in direct proportion to the amount of nitrate given to them when the quantity provided is small. So that a double dose of nitrate causes the growth of a two-fold amount of organic matter, a treble dose gives a three-fold increase, and so on, until that amount of nitrate has been added which enables the plants to grow to their normal size, when, of course, the further addition of nitrate has less and less effect upon the amount of organic matter produced. The cereal crops are thus able to assimilate the nitrates directly, and the growth of these crops in a soil otherwise fertile was found to depend precisely upon the amount of nitrate present. With the leguminous plants no such correspondence was observed. Their growth was quite capricious, and, indeed, sometimes the soil containing the least amount of nitrate would produce the largest and healthiest plants. Many experiments at length led Hellriegel to the conclusion that it was the free nitrogen of the air which constituted the store from which leguminous plants derived their nitrogenous nourishment.

If we accept as correct Hellriegel's conclusion that leguminous plants differ from others in that their roots are furnished with nodules which are the seat of changes due to micro-organisms, whereby albuminoid matter is stored up from the assimilation of free nitrogen, either in the air of the soil or in that of the atmosphere, the question still remains whether the bacteria coming from the soil or the micro-organisms in the nodules are the actual carriers of nitrogen to the plant, or even whether they stimulate the plant in such a way as to enable it to take up free nitrogen by its leaves or otherwise. The experiments of Berthelot and André indicate that, altogether apart from the growth of leguminous plants, some soils are capable of absorbing the free nitrogen of the air. In such cases the gain in nitrogen is associated with a growth of organic matter which has been proved to be due to the presence of small unicellular Algae. Frank, of Berlin, after years of study, has concluded that the root-nodules of leguminous plants are not the cause of the capacity to absorb nitrogen, but are rather the result of that process. He accepts Berthelot's doctrine that small cryptogamic plants, such as certain Algae, are able to assimilate free nitrogen, and that the organic nitrogen in the soil is due in some measure to their growth, but he sees in unicellular Algae, small plants that may be compared with the ordinary chlorophyll-containing cells of green-leaved plants in general, and he is of opinion that the seat of the assimilation of free nitrogen is to be sought in the chlorophyll cells, where it was long since demonstrated that the seat of the decomposition of carbonic acid and the fixation of carbon is to be found. He would admit of no difference between leguminous plants and others as regards their capacity to assimilate free nitrogen in their chlorophyll cells, though he acknowledges that the Leguminosae possess this power in a very remarkable degree. He is, therefore, of opinion that, while fallow land, poor

in organic matter, may become richer in nitrogen through the growth and nitrogen-assimilation of minute cryptogams therein, yet the enrichment is greatly augmented when plants of a higher order are grown upon the land. Some orders of plants, like the Leguminosae, may assimilate so much nitrogen from the air as to leave in their roots and stubble when the crop is removed more nitrogen in the form of nitrogenous organic matter than was there previously. Others, such as the cereals, may assimilate so little atmospheric nitrogen, and make at the same time such demands upon the nitrates in the soil, as to leave the land poorer when the crop is taken off. Between these extremes come all manner of crops which, especially in the later stages of their growth, undoubtedly assimilate free nitrogen, but whether the amount thus assimilated will cause them to be ranked agriculturally as nitrogen-collectors or as nitrogen-consumers must depend upon the greater or less extent of their leaf surfaces, and the consequent multitude of chlorophyll cells exposed to the air, besides, probably, upon specific differences in the ability of the chlorophyll cells to assimilate nitrogen in the various orders of plants. Such, in brief, are Frank's views, which, it need hardly be said, are being warmly controverted by various distinguished chemists and botanists.

It was the splendid achievement of the philosophers at the close of last century to demonstrate the means whereby plants are able to acquire their carbon. A later comprehensive survey of the conditions of life upon the globe showed how animals and plants are associated in the alternations of oxidation and reduction in which that element takes part. It would seem that at the close of the present century we are on the eve of solving that still more difficult problem—of profound interest to the agriculturist—concerning the history of nitrogen as it fluctuates between what are known as the organic and inorganic divisions of matter upon the earth.—*Times*.

DRUG GRINDING.

BY CHARLES A. TERRE, B.S.C.

This venerable and necessary art has been in use from time immemorial, and in many cases we still follow in the footsteps of our forefathers by strictly adhering to the most crude methods imaginable.

Strictly speaking, drug grinders may be divided into two classes—1. Those who grind materials for their own use, and, 2. The drug miller, whose chief occupation consists in grinding other people's drugs at so much per pound.

Of the former little need be said—the goods belong to them, they grind according to the convenience of the moment, and generally giving themselves marked satisfaction.

With the latter the case is entirely different. Competition is keen, and customers are very particular as to the weight, colour and aroma of various goods returned—they sometimes also expect impossibilities.

Before going further, it may be distinctly understood that the drug miller, in order to be successful, must be acquainted with machinery and botany, and likewise have a general chemical knowledge, relying

entirely on this, together with experience, for drug grinding is ignored in books.

Without detailing minor points, drug grinding consists of the following operations:—1. Drying; 2. Crushing; 3. Powdering; 4. Mixing; 5. Sifting; 6. Finishing.

1. Drying is in most cases necessary, as no fine powder can be made from damp goods. Overheating must be guarded against, as both colour and aroma are soon ruined, notably in opium, aloes, rhubarb, orris. Heat is not so necessary as good ventilation. One hundred degrees of the former and plenty of the latter are safe quantities. The loss in drying is of course dependent on the state of the goods received, yet it is a hard matter to convince customers that opium will lose 20 per cent., soap 35 per cent., or green quassia logs 50 per cent. It is likewise difficult to assure them that Cape aloes sometimes contain 25 per cent. of stones, but such is a fact.

2. Crushing.—Few things need crushing before powdering, with the exception of very coarse or heavy substances, the grinding being done at once. Still, when necessary, heavy disintegrators or regular crushers are used.

3. Grinding.—Just at this point is where experience is necessary. Take seeds as an example. If fine powders are required, one's ingenuity is taxed to the utmost. Hardly two need exactly similar treatment, and even the same seed will require different mechanical division if wanted for oil preparing or the general powdered article. Croton and stavesacre seeds, if for oil expression, are most conveniently pulped—not powdered—under fairly heavy putty chasers, whereas a disintegrator with fine screens set, is the correct machine to use for the ordinary powders. Fenugreek and corianders can also be ground in these machines, but need final homogeneity under edge runners, otherwise the powder appears to consist of husks. Cardamoms require the edge runner only, whereas aniseed, caraway, and fennel are only ground to advantage under seed roller mills. Nuxvomica seems, by common consent, to need steaming. It is difficult to understand why, as there is a very good machine on the market capable of grinding 150 pounds per hour, the powder passing through a 90 degree mesh. Mustard is generally powdered under stampers. A well-equipped drug miller's establishment is not a plaything, for, besides plenty of power and all the paraphernalia required to carry on the processes mentioned, there are exhaust fans, decorticators, saws, and chipping machines to be taken into consideration. One of the worst drawbacks—and, unfortunately, the most common—is overcrowding. I once visited an establishment where sang draconis, tumeric, gum arabic, and capsicum were being ground in adjoining machines. The following should find room in all first-class establishments, the number being dependent on the amount of work calculated: First—Disintegrators, with six or eight light iron beaters on each, and movable screens speeded up 2000 to 3000, according to size. These machines are most suitable for roots, barks, some seeds, leaves, capcums, cantharides, etc., and are, moreover, easily

cleaned. Second—Burr stones (horizontal), for salts, as alum, sal Rochelle, black antimony, etc. Third—Pebble mills, for small quantities of poisonous goods, and where time is no great object. Fourth—Seed roller mills, mostly for the very oily varieties; speed low. Fifth—Granite edge runners, five feet in diameter, ten degrees (?) wide, speed 30, for high-class powders, such as best gums, orris, or goods in which colour is a great consideration, notably rhubarb, gamboge, sang draconis, opium, aloes, etc. Sixth—Small stone edge runners, about two feet, speed 40; for all light and friable articles. Seventh—Putty chasers, for coarse work.

4. Mixing.—It is self-evident that as the soft parts of a root or bark are at once reduced, whereas the harder particles remain till the last, the necessity of this process is obvious. A practical man generally devises his own machinery, yet the market is full of good ones, and this is no source of trouble.

5. Sifting.—For large quantities a bolt is preferable to anything, but for poisonous substances there is nothing to equal the "drum sieve." Above all, it is well to remember that all powders need sifting.

6. Finishing.—That is a question of taste, but all brown paper bags should be lined with white or blue paper.

Finally, drug grinding must be looked upon as a combination of scientific and artistic attainments. Everyone who is at all anxious as to his goods should carefully examine them on return. The test is simple—a sense of smell, a magnifying glass and searching physical properties.—*Drug Reporter.*

THE ACTIVE PRINCIPLE OF RHUS TOXICO- DENDRON AND RHUS VENENATA.

Dr. Pfaff, in a paper read before the American Physiological Society, stated that his experiments had been made with the assistance of S. Sanford Orr. He said that it is the general opinion that *R. toxicodendron* and *R. venenata* contain a volatile proximate principle, which causes the well-known dermatitis venenata. Maisch's toxicodendric acid has been generally accepted as the active poison. Pfaff and Orr could not believe that a very volatile substance is the cause of the trouble, as this would be contrary to the pharmacology of vegetable skin irritants. They isolated Maisch's toxicodendric acid in the form of the barium salt, and found it non-toxic. The same is true of a solution of the free acid in water. As the real active principle they found a non-volatile oil. This oil, when applied to the skin, causes the well-known eruption. Photographs demonstrating the effect of the oil upon the human skin were shown. As preventive treatment Pfaff and Orr proposed a thorough washing with water, soap, and brush, or, still better, a repeated thorough washing with an alcoholic solution of lead acetate. The oil being soluble in alcohol, and then forming a nearly insoluble lead compound, is thus best removed from the superficial skin. Further investigations will be undertaken, and an attempt made to classify Maisch's toxicodendric acid and the new poisonous oil, which seems to be of the kind called cardol, obtained from *Anacardium occidentale*. These two oils are, however, not identical.—*Science.*

BACTERIOLOGY IN ITS PRACTICAL ASPECTS.*

BY R. T. HEWLETT, M.D. LOND.,

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It is difficult to define exactly what is meant by bacteriology. This term is now used in a comprehensive sense, equivalent to micro-pathology and even micro-biology, for all investigations connected with micro-organisms, vegetable and animal, are included under it. Bacteriology, however, especially deals with micro-organisms in their relation to processes, disease, fermentation, putrefaction, and the like.

Commercially, micro-organisms are of the utmost importance, and this is daily becoming more and more recognised. When you consider that the beer and wine industries owe their existence to the activities of micro-organisms, that the fertility of our lands is largely due to nitrifying micro-organisms in the soil, that sheep-farming and the silkworm industries in France were once threatened with extinction, the former owing to the ravages of anthrax, and the latter to a disease of the silkworm known as pébrine, you will see that this statement is perfectly true.

Commercially too, bacteriology is important. In brewing, for example, it is found that occasionally abnormal conditions arise technically termed "diseases," which cause considerable loss. It has been demonstrated that some of the worst of these so-called "diseases" of beer are due not to faulty manipulation or to the use of bad materials, but to the entrance of extraneous micro-organisms. Thus, certain "wild" yeasts produce imperfect clarification and bitter taste, a *sarcina* causes a bitter taste and disagreeable smell. To remedy these evils bacteriology has stepped in, and by certain methods it is possible to purify the yeast and to obtain cultivations of yeast bacteriologically pure, that is, containing only a single species of yeast and free from bacteria.

These pure cultivations of yeast are being largely employed on the Continent, and their use is now being introduced into English brewing practice. For the ravages of anthrax and pébrine, through the genius of Pasteur, bacteriology has likewise found remedies. I do not, however, intend to dwell on this aspect of my subject. I wish rather to deal with bacteriology in its relation to every-day medicine and surgery, in its relation to the diagnosis and cure of disease.

Experimental bacteriology has a great deal to tell us about the groups of substances known as antiseptics, for example, by bacteriological methods we are enabled to accurately estimate the value of various disinfectants and antiseptics.

First of all, with regard to antiseptic treatment, most are agreed, I think, of the value of that treatment for wounds, either surgical or accidental, may I suggest that any antiseptic system adopted, to be efficient, should be as simple as possible and free from complications. The use of antiseptics, like everything else, should be tempered with judgment and common sense. We all know that fatal poisoning by carbolic acid, iodoform, and corrosive sublimate, used as antiseptic dressing has occurred, and I have heard of such

accidents as alonging and the like following a too vigorous application of certain antiseptic lotions. With regard to the merits of antiseptic *versus* aseptic dressings, that is, dressings impregnated with an antiseptic, or dressings simply rendered sterile by heat, I would mention that as it is impossible to altogether exclude micro-organisms from wounds it would seem to be desirable to employ antiseptic dressings; the antiseptic constituent of these will then inhibit the growth of organisms if they be present, which would not be the case with aseptic dressings, sterilised wool, and the like.

To me it seems certain that the aseptic system must break down occasionally, no matter how carefully carried out, and that the antiseptic system is theoretically the only logical one, and practically the safer in the long run. Apropos of surgical antiseptics, it is worthy of note that dilute solutions of corrosive sublimate are by no means stable. Vignon and Bucker have found that aqueous solutions of corrosive sublimate of a strength of 1 in 1000 prepared with distilled water, and in the absence of light and air, undergo little change, but exposed to air, the strength diminishes; prepared with ordinary tap water, a considerable proportion of the corrosive sublimate is decomposed; the addition, however, of small quantities of hydrochloric acid (5 C.c. per 1000 C.c.) renders such a solution quite stable. The addition of the acid would not, I think, interfere with the antiseptic action, and its presence would prevent precipitation by albumin.

Some recent researches showing that the potency of antiseptic solutions may be markedly increased by raising their temperature, somewhat seems to be of practical importance. Helder found that spores of anthrax survived an immersion of thirty-six days in 5 per cent. aqueous solution of carbolic acid at the ordinary temperature, but were soon killed when the temperature of the same solution was raised to 55° C.

Chamberland and Fernbach also found that solutions of sodium hypochlorite, chloride of lime, and peroxide of hydrogen were much more potent at a temperature of 40°-50° C. We may have a practical example of the application of these facts in the treatment of diphtheria. Here local treatment is of the utmost importance, and we can increase the activity of our antiseptic paints and gargles without increasing their strength, which might be dangerous, by employing them hot, say at a temperature of 45° C. In surgical practice, hot lotions are of course better for the patient, and we see that they have the additional advantage of being more potent germicides. It has also been shown by Lenti that some substances have a powerful inhibitory action on antiseptics, and may render them inert. Tested on anthrax spores, carbolic acid in olive oil has no disinfecting action, and alcohol and glycerin, when present in large quantities, markedly interfere with the activity of corrosive sublimate and carbolic acid. This is another noteworthy point, seeing how often glycerin forms a constituent of antiseptic throat paints and gargles.

Antiseptic treatment in acute infectious diseases where it would seem to be especially indicated, has

* Read before the Harveian Society of London, November 1, 1894.

failed, and for this reason, that it is impossible to introduce any known antiseptic into the body in sufficient quantity to act as a germicide without danger. It is only where there is some local seat of disease which can be got at that this form of treatment is of any avail, and even here there may be limitations. In enteric fever and cholera, for example, antiseptic treatment is indicated, and may be of service, the difficulty being, however, to get the antiseptic through the stomach into the intestines. In cholera the vomiting and purging are also disturbing factors.

Diphtheria and tetanus are two diseases in which the micro-organisms that produce them are localised, the general symptoms being due to the absorption into the circulation of toxins elaborated by these organisms. In each of these diseases local antiseptic treatment should be useful; in diphtheria it is usually adopted in some form, and should, I think, be persevered with; in tetanus it is probably wiser to treat radically, and to remove the local lesion by excision or amputation, but if this be inexpedient or impossible for any reason, then it would seem to be desirable to inject an antiseptic. Experimentally, it has been shown that iodine has a powerful effect in destroying or rendering inert the toxins of the tetanus bacillus, and I would suggest that a solution of iodine might be valuable in treatment, both used locally and, perhaps, internally.

To bacteriology we owe the development of the promising antitoxic treatment. An animal is treated with gradually increasing doses of the toxin of tetanus, for example, and in time acquires a very high degree of insusceptibility to the disease. The blood serum of such insusceptible animal possesses the remarkable property of curing the disease in other animals and in man. Such a curative blood serum is termed an antitoxine. Here, too, there are limitations—the more acute the case and the longer it has lasted the greater must be both the activity and the amount of antitoxine injected, until finally the dose necessary for cure may become an impossible one.

Some very striking results have been obtained in diphtheria and in tetanus by this treatment. Experimentally the antitoxines have a marvellous power. In tetanus, for example, with which I have chiefly worked, minute doses (1/200 C.c.) of the antitoxine blood serum will render a guinea-pig immune to ordinarily fatal doses of the tetanus toxins. Mixed with the toxins the serum renders them quite inert.

More striking, perhaps, than the curative effect is the immunising power of the antitoxines, and if our hopes are realised, a wide field of practical application is opened out. Moreover, the antitoxines seem to be harmless, so that they will be used in suspected, as well as undoubted cases of disease.

Bacteriology has given us improved methods of diagnosis in several instances. The examination of sputum for tubercle bacilli is now daily practised, and is of the greatest value, for in many instances where physical examination leaves the diagnosis doubtful the finding of bacilli will settle the matter. It must always be remembered that while the presence of tubercle bacilli is proof positive, failure to find them by no means indicates that the case is not tubercular.

(To be continued.)

CINCHONA GATHERING IN PERU.

The mountains of Peru form the natural home of the cinchona-tree, which is easily distinguishable from surrounding foliage by its beautiful leaves and magnificent proportions. The trees themselves frequently attain a height of eighty feet, are straight as a lance, and covered with foliage. The leaves are large and of a deep glossy green, relieved by delicate pink lines. The life of a bark-hunter is one of constant toil and incessant hardship, and his main reliance on his long and solitary journeys in search of the bark is the coca leaf, which he masticates for the strengthening and stimulating qualities it possesses. Since the days of the Incas this coca has been in common use locally, and it is said that among the mountains of Bolivia and Peru, Indians using coca freely when driving pack mules over the roughest roads along the Sierras outstrip well-mounted horsemen. From thirty to fifty grammes are consumed daily, serving both as food and stimulant. The *caecarillero*, constantly using coca, finally loses the senses of taste and smell. There are many varieties of cinchona, which the hunter learns to distinguish through the texture and appearance of the bark. They are red, white, orange, yellow, blue, and grey; the yellow being the finest. Although the pay of the quinine-hunter is very small, it suffices to meet the simple requirements of himself and family, and as a class they are happy and contented with their lot. It is a vocation that is handed down from father to son, but despite long years of experience, coupled with an intimate knowledge of the intricate trails leading to the cinchona tree, the Indian hunters frequently lose their lives in the jungles of the wilderness. Occasionally, a number of hunters start together as a greater protection against disaster. Upon reaching a desirable spot where the signs of paying trees are considered good, preparations for camping are at once made, and from the tops of the loftiest trees the hunters scan the forest, quickly recognising the cinchonas. The task of gathering cinchona bark occupies all the working hours between sunrise and sunset. Armed with knives and keen-edged hatchets, the tree is quickly felled and the trunk is stripped and cleared from all foreign growth. This is a task of considerable magnitude, frequently requiring days of constant labour, the sharp edges of lance-like leaves, mingled with thorns and briars, lacerating and wounding the hunter's flesh. The bark, when removed, is cut into small curling slips and piled up in a convenient spot, where they are subjected to a drying process. The thin portions of the bark curl up, drying rapidly, while the larger and thicker strips retain their shape and are easily packed for transportation. When all is pronounced ready by the *torlego*, or head hunter of the party, the bark is neatly lashed together with plaited grass and bound round with broad tough leaves, as a protection to the cured bark. The Indians and peons then shoulder their burdens, often weighing as much as one hundred and fifty or two hundred pounds—these are kept in position by plaits of grass passing round the foreheads of the bearers, and are thus carried to market.—*Journ. Soc. Arts.*

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POISONING IN SCOTLAND.

A SUPPLEMENT to the thirty-eighth annual report of the Registrar-General for Scotland has just been issued, in which some information is given as to the number of deaths caused by poison during the ten years 1881-1890. Unfortunately, it relates only to cases of suicide by poison, and no details are given in regard to the cases of poisoning by accident. But it is satisfactory to learn that, even among suicides, poison has been the cause of death only in a comparatively small number of instances. During the period of ten years there were, according to the report, in all 2146 cases of suicide, 1495 males and 651 females. Out of that number the number of cases in which poison was employed was 233, or rather more than 10 per cent. of all the deaths by suicide.

Among the poisons employed for suicidal purposes, opium, morphine, and their preparations were, as is usually the case, the most frequent cause of death, the number being altogether 106, or rather more than 45 per cent. In thirty-three instances the nature of the poison causing death is not stated. Of other scheduled poisons, prussic acid is stated to have been the cause of death in eleven instances; oxalic acid, nine; strychnine in eight; arsenic in seven; chloral hydrate, six; potassium cyanide in five; chloroform, three; corrosive sublimate, two. The number of instances in which articles not in the poison schedule have been the cause of death is forty, and of that number sixteen are attributed to carbolic acid.

Although unconnected with the subject of death by poison there is an interesting feature of this report which is worth drawing attention to. It is the comparison instituted between the death rates obtaining among persons engaged in different occupations. Seventy-three occupations have been

selected for the purpose of the comparison, and the relation between them is expressed by the comparative mortality figure computed from the death rates in each occupation, and representing the mean mortality of males between the ages of 25 and 65 engaged in any occupation, as compared with the mortality of all males of similar ages in Scotland, the latter being taken as 1000. From this comparison it appears the chemists and druggists occupy a medium position, the comparative mortality figure being in their case 925, while that of hotel keepers and publicans is as much as 2308. Chemists and druggists stand 36th on the list; and it is of interest to note that while clergymen are 59 on the list, with a comparative mortality figure of 581, physicians, surgeons, etc., are 18 on the list, with a comparative mortality figure above the average, of 1109. With persons engaged in agricultural pursuits the comparative mortality figure is still more favourable.

THE DANGERS OF COMPRESSED GASES.

THE list of fatalities from accidents to cylinders containing compressed gases has been increased by a case presenting unusual features. On Friday, 15th inst., a gardener named HOLBROOK was blown to pieces at Fenchurch Street Station, London, by the explosion or bursting of a cylinder containing compressed oxygen. The cylinder was guaranteed to be of best soft steel, had just been refilled by Messrs. CLARKSON, of Holborn, for Messrs. NEWTON and Co., opticians, Strand, and was sent out with a certificate stating that it had been tested up to a pressure of 3500 pounds to the square inch. It is understood that the contained gas was under a pressure of 1800 pounds only. HOLBROOK was sitting down at the station with the cylinder resting beside him upon the wooden seat. Suddenly a loud report was heard, and HOLBROOK was found dead and badly mutilated, whilst considerable damage was done to the station. The *Daily News*, commenting upon the accident, remarks that there are two great dangers from which those concerned in the production of limelight and using cylinders containing compressed gas have to be guarded—the liability to explosion should the oxygen come into contact with hydrogen, and the possibility of a cylinder bursting should it be unable to withstand the pressure of the highly compressed gas within. In the former case there would be an explosion properly so-called, while in the other, though equal damage might be caused by the velocity with which the fragments of steel would be propelled through the air, there would be no combustion. Some eye-witnesses of the disaster allege that they saw a flame, and such testimony is incompatible with the theory that the cylinder simply burst. In the Leeds case (*vide Ph. J.* [3], xxiv., 417, 438, and 528) it was shown

that the cylinder was not made of suitable metal, but manufacturers now take the most elaborate precautions to render accidents from that cause impossible. Great attention is paid to the quality of the steel, which is carefully annealed, and each cylinder is tested to withstand a pressure considerably greater than that to which it is intended to be put. These precautions having been taken, it is alleged that the charged vessels can be dropped with impunity. On the other hand, considerable caution is exercised to avoid the mixture of gases, the manufacturers being careful to manipulate the two gases in distinct parts of their premises. It is possible, however, that there may be left in an empty cylinder a residue of one gas sufficient to occasion an explosion should it be re-charged with the other. Of late years, therefore, the precaution has been adopted by some dealers of painting vessels intended for one gas black, while vessels intended for the other are coloured red. As a further precaution it has been suggested that the pressure of contained gas should not exceed one-sixth that up to which the cylinders have been tested, but it is questionable whether harm may not be done, by weakening the vessels, by testing to such extreme limits. The strain caused must be exceedingly great, and at best it cannot be guaranteed that the cylinder will bear such a strain, or even one approaching it, again. This point seems worthy of consideration, and it will be a distinct public advantage if the inquiry into the matter should result in the cause of the disaster being precisely indicated, so that more definite precautions may be taken to avoid the repetition of similar disasters.

ACTIVE PRINCIPLES AND GALENICAL PREPARATIONS.

UNDER this heading Dr. RALPH STOCKMAN contributes an article to last week's *British Medical Journal*, in which he re-states the well-known, and yet not too well-known, fact that from a therapeutical point of view it is not always preferable to use pure active principles in place of galenical preparations. When, for example, the general action of morphine and quinine is desired it is most advisable to give them pure, "as they are then more easily administered and more quickly absorbed, and in consequence the beneficial effect is more rapid and decided." When, however, it is desired to act on the alimentary canal, opium or its galenical preparations are considered superior to morphine, and the same is true with regard to quinine and the preparations of cinchona bark. Kino and catechu again act better as intestinal astringents than pure tannic acid. It is suggested, however, that ointment of galls might be made with tannic acid, that elaterin and aloin should replace elaterium and aloes, respectively, that galenical

preparations of nux vomica should be relinquished in favour of strychnine, whilst atropine might possibly be generally substituted for belladonna. Reference is made to the fact that certain drugs in common use contain different principles which act in an antagonistic manner, and that accordingly those drugs and their active principles cannot be used indifferently. It might also have been shown that this indicates that chemical knowledge of the drugs in question is in advance of pharmacological knowledge, for, as Dr. STOCKMAN remarks, medical practitioners are often very much in the dark as to the actual cause of the effects produced in such cases. On the whole, it cannot be said that beyond stating these facts Dr. STOCKMAN has added much of value to the discussion on the revision of the Pharmacopoeia.

THE PROVINCE OF PHARMACOLOGY.

IN an inaugural lecture on "Pharmacology and Therapeutics," since reprinted, Dr. J. B. BRADBURY, Downing Professor of Medicine in the University of Cambridge, expressed the opinion that the province of the pharmacologist is to be a forerunner of the physician, pointing out the therapeutic indications of new remedies and an extended or more rational use of old ones. Though a perfect pathology and pharmacology (if attainable) might lead to a perfect therapeia, they could not replace it. A firm foundation may be laid by them, but the superstructure must depend upon the individual tact and experience of medical practitioners.

SCOPOLAMINE.

THE *Apotheker Zeitung* of 16th inst. contains an interesting note on "Scopolamine Hydrobromide" by Dr. O. HESSE, in which he states that he has reason for believing that it is a mixture of the salts of two distinct bases. One of these bases is described by Dr. HESSE as being identical with the hyosine which has long been known. The other base is isomeric with hyosine, and Dr. HESSE proposes to name it atroscine. The proportion of the salt of this latter base in ordinary scopolamine hydrobromide varies from 11 to more than 50 per cent., and the preparation of the two salts in a state of purity is stated to free from difficulty. Further information on that point will be furnished shortly by Dr. HESSE.

THE ANNUAL DINNER.

GENTLEMEN willing to act as Stewards at the Annual Dinner are requested to send their names to the Honorary Secretary, Mr. RICHARD BREMIDGE, 17, Bloomsbury Square, W.C., without delay, in order that they may be included in the first list, which will be published next week.

PROCEEDINGS UNDER THE PHARMACY ACT.

ON March 20, at the County Court, Carnarvon, before His Honour Sir HORATIO LLOYD, Messrs. EVANS and LAKE, not being registered chemists and druggists, were sued by the Pharmaceutical Society of Great Britain for a penalty of £5 for keeping open shop for the sale of poison, namely, FELLOWS' syrup, on January 2 last. Judgment was deferred. A full report will appear in our next issue.

Proceedings of Societies in London.

THE WESTERN CHEMISTS' ASSOCIATION (OF LONDON).

A meeting of this Association was held at the Westbourne Restaurant on the 20th inst., the President, Mr. Parker, in the chair. There was a representative attendance, and after the minutes of the previous meeting had been read and confirmed, Mr. W. Martindale, was called upon to open a discussion on the forthcoming new edition of the British Pharmacopoeia.

Mr. Martindale prefaced his remarks by saying that they represented his own views only, for, although a member of the Pharmacopoeia Revision Committee of the Pharmaceutical Society, no work had yet been done in that capacity; consequently he was not breaking any confidence. He considered the subject of weights and measures to be the most difficult point in the revision of the B.P., and the more when we take into consideration the fact that the metric system of weights and measures has been adopted by every civilised country, with the exception of Great Britain and Russia, and that, with the exception of our own, every pharmacopoeia employs the metric system exclusively. Hence, unless the latter system be adopted, we are in danger of losing a great part of our export trade with the various countries where the metric system is in force. If, however, the metric system were adopted the system of measuring liquids, as partially adopted in the Supplement to the French Codex, would have to be used. By adopting the metric system the relations between liquids by measure and solids by weight would be clearly defined, but the doses would have to be stated in both the English and metric systems for the convenience of prescribers. Decimal proportions should be as much as possible adhered to. For example, tincture of opium might be made 1 in 10, using crude opium, and standardising the tincture to contain 1 per cent. of morphine. The various classes of remedies in the B.P. were referred to under the following heads:—

Acids.—The present group of liquid acids is both inadequate and redundant. Some are too weak, such as nitric and sulphuric acid for caustics, and hydrobromic and sulphurous acids can be obtained in a concentrated form for preparing the official acids in a much purer state than is at present directed. Acetic acid is redundant. We now have three acids, where two would suffice, as the ordinary acid is made commercially by diluting the glacial acid. *Acetum*, if retained, should be free from sulphuric acid. *Liquor acidi chromici* seems unnecessary, as it is too weak to be used for the purpose of a caustic. *Carbolic acid* should be designated *Phenol*, or better *Carbol*, to indicate its origin.

Ether.—The ether 735 is too much diluted, both by alcohol and water. The gravity should be raised to 725, whilst it would be advisable to introduce an ether prepared from methylated spirit, s.g. 717 to 720, to use for testing and some manufacturing pur-

poses. The retention of Hoffman's anodyne will have to be decided in deference to medical opinion.

Ammonium preparations.—The weaker solutions of citrate and acetate of ammonium should be expunged.

Alcohols.—The plan followed in the French Codex of indicating various strengths of alcohol as the prescriber may require, is favoured. They are made by diluting alcohol containing, say, 95 per cent. by weight. Methylated spirit free from mineral naphtha, for external application, should be recognised.

Aqua.—The distilled waters of orange flower, elder flower, and rose, are objected to on the ground that they can only be prepared at one season, and two are foreign products. All three are apt to become fungoid. The process of the Japanese Pharmacopoeia for preparing them is preferred. It consists in agitating the essential oil of the drug in question with boiling distilled water. Camphor water should be of definite strength.

Cachets and Capsules should be recognised.

Collodions might be extended as a class. The formula for simple collodion needs careful investigation to determine the best proportion of alcohol, ether, water, and pyroxylin to use, so that a transparent, contractile, and non-brittle film may be produced.

Confections.—Only confection of sulphur and confection of senna appear worth retaining.

Decoctions.—A uniform direction applicable to the whole of this class of preparations is advisable. Thus, boil 1 part of the drug in 30 parts of distilled water for 10 minutes; strain, and pour enough distilled water over the strainer to make up to 20 parts. This is a modification of the plan adopted in the French Codex, and could be adapted to unofficial drugs.

Elizirs.—Formulae for these might be admitted.

Emplastra.—These are unnecessarily complex.

Enemas.—These seem unnecessary, as they are generally prepared extemporaneously according to special formulae. A nutritive enema might be added.

Extracts and Liquid Extracts.—The rationale of the processes for solid and liquid extracts of cascara was criticised. Taking the preparations as a class considerable improvement in the way of shortened processes is necessary. The "one in one" liquid extract was condemned, a fifty per cent. liquid extract being preferable.

Glycerins.—Several additions may usefully be made.

Medicated Wools and Gauzes.—The official recognition of these as antiseptic dressings, impregnated with salicylic acid, iodoform, sal alembroth, etc., was recommended.

Granules and Pilules.—Preparations of aconitine, digitaline (crystallised), and strophanthine might be introduced in these forms, similarly to the Codex. Samples were shown by Mr. Martindale which had been made in an ordinary pill machine. They weighed 2/3 grain, contained 1/10 milligramme aconitine, and were made up with sugar of milk and coloured with carmine.

Infusions.—Three-fourths of these are very seldom used, and a general direction might be given similar to that given for decoctions.

Infus. Cinchonæ Acidum.—Specially should be deleted. Concentrated infusions were condemned, as well as cold water infusions.

Iodoform should be in crystals, and *coumarin* should be used to aromatise it:

Lamellæ.—Of doubtful utility with a gelatin basis.

Hypodermic Injections.—All alkaloidal solutions should be preserved with salicylic acid, similarly to the official solution of hydrochlorate of cocaine.

Liquors.—A soapy solution of cresol might be added.

Liquor Hydrargyri Perchloridi should have the chloride of ammonium omitted.

Lotions.—Additions in the shape of lotions of boric and carbolic acids, and perchloride of mercury should be made.

Mixture.—*Mistura Creosoti* should be diluted.

Oils.—The use of the term "Otto" is recommended for all essential oils to avoid confusion with fixed oils. The proposed substitution of sesame and cotton seed oils for olive oil was deprecated.

Paraffin.—The use of a mixture of hard and soft paraffins was recommended for an ointment base which would not completely liquefy under 113° F.

Pepsin.—Should be freer from peptone than the present preparation, and of greater digestive power.

Pessaries.—It is proposed to introduce a gelatin basis for these.

Pills.—The formulæ should be modified for several.

Powders.—Several of these might well be added.

Soap.—As a class should be exactly defined.

Spirits.—An official preparation corresponding to Rubini's preparation might be included, and some at present official deleted.

Succi.—Might be extended.

Suppositories.—It is recommended that the curd soap basis be discarded, and the cacao butter used in its place; also in such a case as morphine, other strengths than a standard suppository could become official by stating that more or less medicament could be used if needed.

Syrups need simplifying in some cases. The water should always be boiled before using it for the syrup.

Tablets, Compressed.—The introduction of these was noticed but not recommended.

Tablets with Chocolate are recommended for nitroglycerin, cocaine, and menthol.

Tablets for hypodermic injection.—It is said that the use of a basis consisting of a mixture of acid or acid salt (such as cream of tartar) and an alkaline carbonate greatly aids the solution, which is often otherwise slow.

Tinctures need decimalising, and in some cases standardising. In some cases the strength might be increased. Maceration and percolation admit of uniform results, but special methods of procedure are necessary.

Lozenges.—The introduction of black and red currant basis is recommended.

Ointments.—Some could be modified considerably.

Inhalations.—Doubtful if they should be included.

If admitted they should be considerably increased and altered.

Wines.—Sherry is probably the best for most purposes as the vehicle. The present process for vinum ferri should be retained. A sweet Malaga wine suitable for children should be introduced.

Mr. Parker, President of the Association, in opening the discussion, was of opinion that percentage solutions should all be made so that one grain of the medicament was contained in 100 minims of the finished product, believing that to be the intention of the prescriber. With regard to suppositories, he was not in favour of giving particulars directing that more or less of the medicament could be used if required. He would rather have one morphine suppository of a definite strength, so that no misunderstanding could occur if only the term morphine suppository were used. He was not in favour of allowing two qualities of drugs to be introduced, as for instance both the natural and artificial salicylic acid, and chloroform and ether prepared from pure and methylated spirit.

Mr. J. C. Hyslop, in the course of his remarks, characterised the pills and ointments of the Pharmacopœia as a disgrace to pharmacy, and alluded to the variability met with in various trade samples of pills.

Mr. Davies, who followed, objected to the introduction of tablets into the Pharmacopœia, and gave some particulars of the method adopted at King's College Hospital for ointment making, in which the finished product was rubbed through a sieve, and ensured a perfect product.

Mr. C. B. Allen, in alluding to the question of the introduction of the metric system of weights and measures, was of opinion that even if that were done the old system would have to be kept on, so that the two would work side by side. He advocated the use of a glyco-gelatin basis for the manufacture of pastilles, and their official recognition. He did not wish to see the Pharmacopœia become a compendium of general information, as some seemed to be inclined to make it.

Mr. Gulliver was in favour of more complete tests to each article in the Pharmacopœia, so that no difficulty would be experienced by the pharmacist in ascertaining the purity of his drugs.

Mr. Pickard alluded to the bad condition in which the iodide of iron was usually sent out, and said that 10 per cent. of reduced iron should always be added to it, if a fairly stable preparation were required.

Others who took part in the discussion were Messrs. Cracknell and Taplin.

Mr. Martindale, in his reply, laid stress upon the fact that if the metric system be adopted at all it will have to be the only system. It cannot exist side by side with our present system. He was of opinion that it would probably be adopted in the next Pharmacopœia, as the Royal College of Physicians, amongst others, was in favour of it.

After Mr. Taylor had proposed and Mr. Andrews seconded a vote of thanks to Mr. Martindale, the meeting terminated.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, March 14, Mr. H. T. Durant, Vice-President, in the chair. A paper on Argon, the new constituent of the air, was read by Mr. A. M. Peter, who summarised the investigations which had been carried out, and the facts which had been ascertained regarding this body.

Mr. J. R. Walker then relieved Mr. Durant in the chair, and the Reporter on Pharmacy gave his report as follows:—

REPORT ON PHARMACY.

BY WM. MOORE.

In taking a retrospect of the Pharmacy of 1894, one is impressed by the progress that animal preparations have made in every-day pharmacy, and, secondly, by the army of synthetic products which are forced upon us, have an ephemeral fame, and are forgotten. Pharmacy is indeed suffering from an epidemic of new remedies.

Animal extracts.—Thyroid extract does seem to deserve much of the credit it has gained, both with the medical profession and the public. The most attractive form in which it is supplied is compressed tablets. There are many objections to these. They are generally the dried and powdered glands, compressed and sometimes coated, are naturally hygroscopic, contain unaltered animal matter, and are therefore very prone to putrefaction. When the remedy is demanded in a solid state, the least objectionable is found to be the dried precipitated extract, devised by Mr. Edmund White, who published his process in the *Pharmaceutical Journal* (3rd ser., vol. xxiii., p. 651). This powder is non-hygroscopic, perfectly stable, and may be dispensed in powders or cachets. Up-to-date pharmacists are now stocking the antitoxins of tetanus and diphtheria, since they are acknowledged to be of value, whilst many others, such as testicular extract and supra-renal capsule extract, remain at the probational stage.

Synthetic bodies.—Of the new synthetic bodies those intended for use as hypnotics are by far the most numerous, although as yet it seems that the perfect one has still to be discovered. Many of them are of proprietary origin, so that it would be invidious to expressly mention them, others are old friends furnished up and reintroduced under new names, or differing only in unimportant particulars. To this latter class belong such compounds as bromal hydrate and bromoform, which have no particular advantages over their chlorine analogues. Chloralose and chloraloxime are effectual in smaller doses than ordinary chloral hydrate, but have no further advantages.

Aluminium compounds.—The claims of aluminium compounds for use as astringents and antiseptics seem to be scantily recognised; they may be used as powders for dusting, or in solution. A selected few may be given as examples, such are alumol (aluminium naphthol sulphionate), salumin (aluminium salicy-

late), tannal, boro-tannal or cutol (aluminium borotannate).

Antiseptics.—Tablets of mercuric chloride mixed with bicarbonate of sodium and tartaric acid and coloured, are now largely used for extemporising antiseptic solutions. Unfortunately there is great want of uniformity in the colour, size, and strength of the products of different manufacturers, whilst the carelessness with which they are distributed is beyond comprehension. I have seen an ordinary one-pound white wood-top corked bottle, such as is ordinarily used for lozenges, filled with them, having merely a name on a written label and a small "poison" slip attached. They were of such colour and size that they could not be distinguished from lavender lozenges at a yard distance. They are official in the new supplement to the German Pharmacopœia just published, as is also another antiseptic which is coming much to the fore, solution of formic aldehyde (35 per cent.), known in this country under the proprietary name formalin.

Compressed Potassium Permanganate.—Another form of compressed medicament capable of abuse is that of potassium permanganate. It is to be hoped that the enterprising manufacturers who introduced the tablets never intended them for other use than as disinfectants. Whilst admitting the general utility of compressions, their indiscriminate use is to be deplored, and it is questionable whether their introduction can have been upon the whole of benefit either to pharmacy or the public.

Glycero-phosphates and Ferratin.—Physiological data are being largely taken into account in selecting remedies which are intended to become readily absorbed in the system. The glycero-phosphates come under this category; they are prepared artificially in a perfectly pure condition. They are regarded as a most suitable source of assimilable phosphorus, since glycero-phosphoric acid is a decomposition product of lecithin, resulting from the decomposition of nerve tissue. Ferratin is another product of this type. It is described as an albuminate of iron, obtained from liver, but the process is not made public. Its claims to recognition are that it causes no irritation in the stomach, and does not affect the teeth, the inference being that it is an absolutely inert substance which passes through the system unchanged.

Standardisation.—The researches of Paul and Cownley upon *Ipecacuanha*, recently published, conclusively show that it is possible to standardise the drug for alkaloid value, but that titration alone would be insufficient if the second alkaloid should prove to be inert and require to be separated. It is shown to be possible to standardise eucalyptus oil for eucalyptol, by the process patented for manufacturing purposes by Faulding, which consists in adding syrupy phosphoric acid to the oil at a low temperature, when a compound of phosphoric acid and eucalyptol crystallises. This compound is decomposed by water and distilled.

Apparatus.—The public are becoming educated to require their remedies presented in an attractive and palatable form, and also with the least possible delay. Pastilles and cachets are the most popular forms. A

simple piece of apparatus devised by Mr. Bilson, a Bournemouth pharmacist, can be used to turn out medicated glycerin pastilles in a few minutes. It is only necessary to keep a stock mass of glyco-gelatin in readiness; a formula used by the inventor consisting of one part gelatin, two and a half parts each of glycerin and water. The introduction of cachets naturally caught the popular fancy, but being regarded by the average pharmacist as an innovation, they have not been pushed by him to the extent which they deserve. Equipped with a simple machine like the Morstadt apparatus, there is no reason why they should not be dispensed at the same price as powders, as their preparation undoubtedly requires less time. A machine supplied by Messrs. Christy and Co. is capable of filling three sizes at once.

The report gave rise to a discussion, in which the Chairman, Messrs. Aubrey Hill, Davis, Tunbridge, Tickle, Guyer, Jealous, and the Secretary took part.

The meeting then adjourned.

ROYAL INSTITUTION.

THE RARER METALS AND THEIR ALLOYS.

The lecture delivered by Professor Roberts Austen at the Royal Institution, on March 15, was devoted mainly to a description of the effects produced by the presence of rare metals in traces, on the properties of the "base" metals, and *vice versa*.

Professor Austen's experience as chemist at the Mint, and Professor of Metallurgy at the Royal School of Mines, enables him to speak with authority on the most recent modifications of alloys, and imparts additional interest to his remarks. The incident of the little tin soldiers of 'Hans Andersen's' Fairy Tales was used at the commencement to illustrate the effect of heat upon alloys, and in tracing the points of resemblance between men and metals allusion was made to the similarity of terms used to describe pre-eminent qualities in both. Thus there is a class of "noble" metals, as well as a large number which by themselves can serve no useful purpose, but have to be associated with one another in various ways before useful products can be obtained. The alchemists regarded the metals as bodies having volition of their own, the "noble" metals being such as resist the fire, as noble natures among mankind resist temptation, and the microscope, which has done so much for the biologist, is now largely instrumental in studying the effects of environment and minute traces of foreign matters on the morphology of metals. The "rare" metal of the metallurgist is not necessarily considered rare by the chemist, for the latter called those which are only found in small quantity rare, while the former reserved the term for difficultly reducible metals.

Among the rare metals of the metallurgist may be considered those which occur in the free state, such as gold and the metals of the platinum group, and those which occur in combination, generally as oxide, such as chromium, manganese, titanium, uranium, zirconium, molybdenum, and tungsten, and one might add nickel and cobalt. Carbon has no effect in reducing the compounds of these metals under ordinary condi-

tions, but aluminium possesses deoxidising properties to a peculiar extent, and may be described as "greedy" for oxygen. Although it may be heated strongly in air or oxygen without more than a superficial oxidation, it will still remove oxygen from the oxides of many metals, notably in the case of chromium. In the case of the rarer metals, the action goes on without violence, but when the baser oxides are treated, reduction occurs with great energy and sometimes with explosion, as when aluminium is heated with lead oxide.

In the course of these preliminary remarks two experiments were made which strikingly illustrated how metals in the state of oxide differ in resisting reduction to the metallic state. In the first, when oxide of chromium was fused with finely divided aluminium, the chromium was found to give up its oxygen to the aluminium with the greatest difficulty, the temperature indicated by the pyrometer being 2500°. In the second instance oxide of lead was fused with the aluminium. Here the oxide was so easily reduced that an explosion, more or less violent, occurred in the furnace used for the purpose.

The combustible properties of titanium were illustrated in a striking manner. It burns with great brilliancy in air and in nitrogen, and resembles vanadium in the fact that both are reduced with extreme difficulty, a continuous heat of three to four hours and the association of an electric current being necessary before it can be isolated. After alluding to the fact that the rarer metals cannot be obtained without the association of a small percentage of carbon, carbides being thereby formed, Professor Roberts Austen paid tribute to the invaluable researches of Moissan, on the isolation of the rarer metals.

The electric-arc furnace, by which so much work had recently been accomplished in the reduction of the rare metals with the acid of carbon, was primarily due to Siemens, but has been brought to its present state by Moissan, from whom a number of specimens of rare metals, such as have never before been exhibited, had that day been received. By means of Moissan's furnace, in which an electromotive force of from 800 to 1000 volts was used, and a temperature of 3000° C. was attained, chromium, whose melting point largely exceeds that of platinum, had been reduced and fused, and although the electric arc usually produced carbides instead of the absolutely pure metals, its value was still enormous. As a matter of fact, we know little of the rare metals except in combination with carbon. Even iron and steel are unknown to the metallurgist except as containing carbon as an essential constituent, and Moissan has obtained diamonds by heating carbide of iron in the electric arc, and cooling it in water, or better, in molten lead.

The principal value of the rare metals lies mainly in the effect which they produce when present in small quantities in the commoner metals, and similarly the latter have a peculiar effect on their rarer fellow-metals. Thus, the presence of one-fifth of one per cent. of bismuth largely lowers the fusing point of gold, and reduces its strength, while an equal amount of

instilling into the "caitiff wretch's" mind doctrines subversive of social order, such as the famous

The world is not thy friend, nor the world's law,
Romeo took care to leave behind a letter giving a clue to the source of his purchase, and we may, therefore, infer that the poor apothecary did not long enjoy the tempter's ducats.

In the pages of Molière, a member of the pharmaceutical craft fills a place in the comedy "M. de Pourceaugnac," as the satellite of a doctor, whose patients he entertains in the waiting-room with stories of his master's marvellous skill. In the famous "Malade Imaginaire" we are introduced to Monsieur Fleurant, whose exorbitant bill Argand, the imaginary sufferer, is engaged in checking at the rising of the curtain. Monsieur Fleurant sugars his charges by the most flowery expressions concerning the action of his potions. As thus:—

... The same day an hepatic julep, soporative and hypnotic, prepared to send Monsieur to sleep: 35 sols. ... On the 25th a nice purgative and corrective draught, made up of fresh cassia fistula, with Turkey senna and other ingredients, according to M. Purgon's prescription, to expel and evacuate Monsieur's bile, four livres, etc.

The play is concluded by a medico-pharmaceutical ballet, which is of special interest, because Molière wrote it on the day of his death, February 17, 1673.

The older writers habitually introduce the apothecary as a personal retainer of the physician. Chaucer, for instance, introduces a doctor of physic who regales his fellow Canterbury pilgrims to a *fabliau* of his own. It is stated of this physician that

Full redy hadde he his apotecaries
To sende him dragges, and his letuaries.

In the seventeenth century, however, the apothecaries in England began to usurp functions properly belonging to the medical profession. This fact is responsible for many scornful allusions to the craft among our poets and novelists. Thus Dryden (Epistle XIII.) writes:—

Th' apothecary-train is wholly blind,
From files a random recipe they take,
And many deaths of one prescription make,
Ungrateful tribe! who like the viper's brood,
From medicine issuing, suck their mother's blood!

while Pope denounces the apothecary playing the doctor's part "bold in the practice of mistaken rules" with his usual vigour.

We are indebted to that prolific author, Captain Marryat, for the creation of Mr. Phineas Cophagus, the most detailed picture in English fiction of the apothecary of the Georgian Era. Besides Cophagus, Marryat has drawn for us Mr. Brookes, the gentle but phthisic assistant; Timothy, the errand boy; Japhet himself, who afterwards becomes a full-blown apothecary at Reading; and Mr. Ebenezer Pleggit, the single-window-shop rival and neighbour of Cophagus.

An altogether different personage from the dignified Cophagus, though belonging to the same historical period, is Mr. M'Garry, the west of Ireland apothecary in Samuel Lover's story 'Handy Andy.'

It would be unfair to accentuate the contrast between the humour of the characters of Cophagus and M'Garry and the delicate touches with which Thackeray has outlined the pharmaceutical career of

the elder Pendennis, from his humble beginning as a small apothecary until his culmination in the ranks of the squirearchy. Thackeray's peculiar vein of cynicism constantly peeps through his references to John Pendennis. He pictures the apothecary curing Master Ribstone, the son of Sir Pepin Ribstone, of an indigestion; his consequent patronage by Lady Ribstone and society in Bath; his gradual withdrawal from the apothecary business, leaving him "with only a little surgery attended by a genteel young man"; his accretion to the ranks of "Gigmanity"; and his final transformation into John Pendennis, Esquire, of Fair Oaks, Clavering, who disliked reference to his late surgery as much as Pendennis the surgeon had disliked reference to the bygone drug-shop. We recognise in him at once the man true to life, whose replica we constantly encounter. Life-like, too, is the Mr. Thomas Groffin, the tall, thin, yellow-visaged chemist in the 'Pickwick Papers.' With Groffin we arrive at the reign of the chemist, *vis* apothecary, deceased. As "chemist," too, the craftsman Jenner figures in Charles Reade's 'Hard Cash.'

There is a slight sprinkling of apothecaries in German fiction—mostly in humorous novels and popular comedies, where they are generally held up to popular derision. In Goethe's 'Hermann und Dorothea' the apotheker is a selfish, loquacious, and rather close-fisted grumbler.

In 'Apotheker Heinrich,' a novel by Hermann Heiberg, a prominent German author, the characters are almost exclusively medical and pharmaceutical.

The finest pharmaceutical character, from a literary point of view, in the whole realm of fiction is M. Homais, one of the leading personages in Gustave Flaubert's famous novel, 'Madame Bovary.' The grotesquely comic Homais is not a pleasant person. He is as self-seeking, mischief-making, conceited, and cringing a snob as can be found in French literature, an ardent village politician, and a sham scientist, always airing his scanty stock of rickety chemistry and dog-Latin. He is fond of addressing imaginary audiences concerning his devotion to Pantheism, and his respect for the deity of Socrates, of Franklin, Voltaire, Béranger. The declaration of the Rights of Man, and quotations from the encyclopedists, loom in his conversation almost as largely as quack chemistry. Although a contemptible fellow, Homais is a good pharmacist. His head is as full of formulæ as a text-book, not only for medicines, but for jam-boiling, cheese-preserving, and wine-doctoring.

There is another pharmacien in French fiction whose sphere of activity is laid in the same district as that of Homais—namely, the Polish chemist Marowski, in Guy de Maupassant's 'Pierre et Jean,' a broken-down Polish refugee, supposed to have passed through a long career of Nihilistic propaganda.

To Alphonse Daudet, the first living novelist of France, we owe the creation of two pharmaceutical types which will have as lasting a place in literature as Homais. But whereas Homais is the incarnation of the selfish, prosaic, crafty *bourgeois* of the North, the pharmacien Bézuquet, and still more so, his assistant Pascalon, are representatives of the almost

sub-tropical South, utterly foreign to northern conceptions. The pair play a prominent part in the three novels recounting the adventures of Tartarin of Tarasoon.

In another of Daudet's books, 'Jack,' we make the acquaintance of two ladies who may almost be classed as pharmacists. They are Mme. Rivals, the wife of an old country doctor, and her granddaughter Cecile.

Among British living novelists there is probably not a single one of eminence who has drawn an adequate picture of a pharmacist. A firm of chemists is mentioned in a novel called 'Laura Ruthven's Widowhood,' published a few years ago, but the characters are scarcely of a kind that are likely to find a permanent place in literature.

A chemist named Joseph Blake occurs in a book called 'A Modern Minister,' the author of which has had the sense to remain anonymous.

Considering that about 1600 novels are published in this country every year, it is probable that many pharmaceutical children of fancy are born to bluish unseen and pine away on the twopenny heap of the coster's barrow, among forgotten Romanticists and Restoration comedies. Indeed, the pharmacist, or at any rate the chemist, does flourish in odd nooks of literature.

A few examples may suffice:—

As the doctor's steel-gray eye turned upon him, the baronet's cheek blanched. With long accusing finger the physician pointed to a stain, evidently several hours old, upon the baronet's shirt-front. "Ha!" exclaimed the doctor, "what have we here? Chloroform! See, the peculiar deep-blue discoloration which that drug leaves behind!"

In another story the villain poisons a good old man with prussic acid surreptitiously abstracted from one of the carboys standing at the door of the drug store. A third novelist introduces a heroine suffering from insomnia, whose only means of procuring sleep consists in taking a nightly dose of 30 gr. of hydrate of brucine; yet another causes a murder to be detected by making one of his characters apply his nose to an innocent-looking bottle, and accidentally "catch a whiff of the strychnine it had contained."

These are the first-fruits of awakening consciousness to the importance of pharmacy as an aid to novel-writing. The pharmacist's ambiguous position between the professional and the trading classes may have rendered him a specially suitable butt for the splenetic writer. Are not his charges notoriously exorbitant? Eighteenpence for a bottle containing a pennyworth of drugs? Monstrous! Down on the rascal with all the armoury of satire! When an artist like Mr. Whistler declares that he is justified in charging 300 guineas for a sketch which is an afternoon's work because it represents the training of a lifetime, the public applaud the sentiment. When the chemist applies the same principle to an 8-oz. mixture he is dubbed an extortionate cheat. It is all a question of degree.

A few years ago the late R. L. Stevenson urged a friend of his, an English chemist on the Riviera, who had written a novel of which a pharmacist was the hero, to send the manuscript to a London publisher. It was returned with the chilling remark that the

public had no interest in chemists, and that therefore the work could not be accepted. That argument appears singularly fatuous. At a time when the cry is all for psychological novels, for studies of character, one would have expected from a publisher a better appreciation of the truth of Goethe's saying, "Dip but into the full human life—wherever you grasp it it is interesting." The few examples from foreign writers show that the pharmacist can be made interesting enough. By virtue of his intimate connection with potent drugs, his association with a science which has achieved some of the greatest triumphs of the century, his relations with his customers, obviously more delicate and human than that of the man who planks down a pound of butter or hands a beetle-trap from the shelf, one seems justified in regarding the chemist as a particularly promising subject for the writer of fiction. In that belief we may wait patiently for the day when the sympathetic hand of a great English writer shall draw for us the modern pharmacist, with his struggles, his troubles, his weaknesses, his many acts of self-sacrifice and kindness of heart, and light up the sketch with that artist's touch that, "in a trice, life's leaden metal into gold transmutes."

And is it too much to hope that the writer may himself spring from the ranks of pharmacy? Were not Ibsen's first dramas conceived in the Swedish chemist's shop where he served his apprenticeship fifty years ago? Was it not in an apothecary's house at Edmonton that the genius of one of the greatest English poets disclosed itself—the genius of Keats, whom the *Quarterly Review* would have driven back to his pills, his ointment-boxes, and his plasters?

Provincial Transactions.

MANCHESTER PHARMACEUTICAL ASSOCIATION.

At the meeting held on Wednesday, February 13, Mr. H. Kemp in the chair, the following paper was read:—

CO-OPERATION IN PLANTS.

BY GEO. CLAYTON.

Although in some cases it is difficult to distinguish between true parasitism and symbiosis, and to say definitely that the host plant does not get some advantage from the parasite which feeds on its juices, yet innumerable cases are known where the two plants in union mutually benefit each other, and the term applied to such unions would be symbiosis. Symbiosis may then be defined as the associated existence of two or more plants for purposes of nutrition.

Unlike parasites, two symbiotic plants living in union each supplies its partner with material which the partner requires; a "give and take" or reciprocity system being the rule of their combined existence. Many of the forest trees, common shrubs, etc., have attached to their roots fungoid partners which, absorbing from the ground moisture and mineral matters, hand these chemicals over to the larger tree, receiving in return starch and other organic chemicals which the tree formed in its foliage.

The common black poplar, and many other plants, have woven over their roots the thread-like filaments of fungi.

In the first instance, the root which descends from the germinating seed into the ground becomes entangled with the myceloid filaments of the fungus already existing in the soil, thenceforward the connection continues until death. As the root grows onward the mycelium which invests it grows with it, accompanying it whatever direction the root may take.

Great difficulty is often experienced in rearing various species of rhododendron, broom heath, and many other plants, also in transplanting the same. This difficulty is now accounted for by the rhododendron (for instance) being unable to find its symbiotic partner in some soils in which it is transplanted. The transplanted rhododendron therefore perishing on account of its being unable to assimilate the necessary materials from the soil.

Also, when the attempt is made to rear seedlings of the beech and fir in a good soil destitute of fungus filaments, the seed after germinating and growing a short time perishes, but, if soil or mould recently brought from a wood, or known to contain the living mycelium of the fungus, be placed at the root of the seedling, it at once begins to grow vigorously, owing to its having "connected on" the smaller subterranean partner, which feeds it from the ground.

The number of plants having symbiotic relations of the kind described is very large, most of the Ericaceæ, Coniferae, and Cupuliferae co-operating with subterranean partners. It is notable that the chief species of flowering plants which are symbiotic are gregarious in character, and like the oak, fir, heather, etc., form large forests, or moors, and one may be filled with wonder at the magnitude of the immense colonies of subterranean fungi which must exist interlacing themselves at the roots of such forests of trees.

It will also be plain why there is such a profusion of fungi of all kinds in forests and round the roots of certain trees. The lichen is now almost generally admitted to be of a composite character, each lichen being comprised of (1) a fungus made up of a web of myceloid threads with (2) an alga in its interior the combination of alga and fungus thus forming the one lichen plant.

The myceloid threads of the fungus being most exterior fulfil the function of gathering from the air moisture, whilst its partner, the alga, owing to its having chlorophyll, manufactures starch and other chemicals; thus here, again, the partners supply each other with matter necessary for the life of both.

A most interesting proof of this union is afforded by the fact that a lichen may be actually synthesised by sowing certain algæ along with certain definite fungi in a favourable place, when the two separate plants amalgamate and interweave their cells, with the result that a lichen is formed.

The co-operation of certain animals or insects with plants is most interesting, the relations between the yucca plant and yucca moth, the fig tree and fig wasp,

being pointed out to show that many insects and plants may be regarded as forming a symbiotic community.

The paper was listened to with much interest by a large number of members and their friends.

Reviews and Notices of Books.

A COURSE OF ELEMENTARY PRACTICAL BACTERIOLOGY, including Bacteriological Analysis and Chemistry. By A. A. KANTHACK, M.D., M.R.C.P., and J. H. DEYSDALE, M.B., M.R.C.P. Pp. 180. Price 4s. 6d. (London: Macmillan and Co., 1895.)

The scope of this work is well defined by its title, and it is doubtful if anyone desiring to become acquainted with bacteriological technique could have a better guide in book form. The authors have both had practical experience as teachers of bacteriology, and are now engaged at St. Bartholomew's Hospital, where they have been in the habit of giving out slips to the students, with full directions about the work to be done from day to day. These slips having been collected and arranged, the outcome is the present small hand-book. It is divided into lessons and arranged in three parts, the first dealing with general bacteriology, the second with bacteriological analysis, whilst the third is an introduction to bacteriological chemistry, and constitutes an appendix to the two previous parts.

There are sixteen lessons in Part I., the first being devoted to detailed descriptions of the methods of inoculating agar-agar, potato, gelatin, etc., with various forms of bacillus and staphylococcus, as well as sarcina, aspergillus, and torula. Instructions are also given for studying the action of light, oxygen, and heat on the growth and metabolism of bacteria. In the next lesson several of the types are further studied and instructions given for staining them with simple basic aniline dyes—fuchsin, gentian-violet, and methylene-blue. Hanging drop cultures and pus are next examined and stained with Löffler's methylene-blue and by Gram's method. A specific form—*Bacillus anthracis*—is then taken and studied in considerable detail, occupying the major portion of four lessons. Acid formation, methods of attenuation, asporogenous cultures, impression specimens, examination of fresh tissues, plate culture method, staining of spores, and staining of tissues in frozen sections, all receive attention, and are dealt with in a thoroughly practical fashion. In subsequent lessons the organisms associated with cholera, actinomycosis, typhoid fever, pneumonia, diphtheria, leprosy, tuberculosis, glanders, tetanus, etc., are considered, numerous minor operations being described in the course of the work, and, lastly, attention is directed to phagocytosis and chemiotaxis.

The second part contains twelve lessons, and detailed instructions are there given for the examination of water, milk, air and dust, soil, decomposing meat, ice creams, antiseptics and disinfectants, animals dead of bacterial disease, and filters. The ten lessons in Part III. deal with the preparation of metabolic pro-

ducts of micro-organisms, proteines, bacterial pigments, peptones, albumoses, diphtheria toxin, ferments, enzymes, and ptomaines.

The work is eminently practical throughout, formulæ for stains, etc., being given when required, and the manipulative processes being described with great accuracy and minuteness. In properly fitted bacteriological laboratories the book will save an enormous amount of time to teachers and demonstrators, whilst private students provided with suitable material will find all the instruction they require, after they have once mastered the essential preliminaries. To pharmacists and medical practitioners in particular a most useful practical guide is thus afforded, the purchase of various expensive treatises will be obviated, and now the time employed in consulting them more profitably utilised. The authors are to be congratulated on producing a thoroughly satisfactory hand-book, in which the voluminous practical details are concisely and conveniently arranged.

INDIGESTION, AN INTRODUCTION TO THE STUDY OF THE DISEASES OF THE STOMACH. By GEORGE HERSHELL, M.D. Pp. 343. 5s. net. Second Edition. (London: Baillière, Tindall, and Cox, 1895.)

The author of this hand-book is to be congratulated on having produced a thoroughly sound, reliable, and conscientious work which is not written, as are too many books on common complaints, for possible patients, but for medical practitioners. The general public would not be able to understand a single page, whilst medical men would find every page full of information and reliable guidance. The first chapter might perhaps have been omitted without disadvantage as it deals with the physiology of digestion, and though clear enough, carries the subject not further than does any good text-book of physiology. The remainder of the work bears the impress of careful individual labour, and constitutes a really valuable addition to medical literature. The scope of the work will be best explained in the author's words: "Until quite recently it was considered sufficient to make a diagnosis of indigestion, and the practitioner, when he had done this, and excluded cancer, ulcer, acute gastritis, and perhaps, if he were a very able man, stricture of the pylorus, flattered himself that he had done all that was expected of him for his patient. He then proceeded to prescribe for a condition, of the exact nature of which he was profoundly ignorant. He was perfectly right. The most that could be done with the small amount of definite knowledge which was the common property of the profession, was to divide cases of chronic dyspepsia into two groups—those which were accompanied with gastritis, and those which were not. The former he termed 'irritative' and the latter 'atonic' dyspepsia. But the work of the last few years and the discovery of improved methods have placed our knowledge of the different affections of the stomach upon such a footing that no one has now any more right to make a diagnosis of indigestion, and end there, than he would have to make one of dropsy or cough." In

keeping with this statement we find that not only are the ordinary clinical features fully and clearly set forth, but the methods of chemical examination of materials obtained from the stomach, either naturally by vomiting or by the use of the stomach-tube, and the chemical examination of the urine are explained in the clearest and most practical manner.

At the end of the book a series of illustrative cases is given for the reader to practise himself in diagnosis. This is a most useful feature in the work. The print and general appearance of the book leave nothing to be desired.

THE ILLUSTRATED HINDU MEDICINAL PLANTS. By PURNA CHANDRA SAHA. (Calcutta, 1894.)

The author of this work was formerly Curator of the Hugli (Hooghly) Botanic Gardens, and is at present Lecturer to the Gossipore Practical Institution of Horti-, Flori-, and Agri-culture. He accompanied Dr. Geo. Watt in many of his botanical excursions, and should, therefore, be tolerably well acquainted with the native medicinal plants of India. His idea in publishing the work seems to have been to produce an illustrated work, readable both by Hindus and Europeans, concerning the medicinal plants of India, especially those mentioned in the Ayurveda. He hopes to finish the work in five parts if it is well received by the public. The first part occupies about forty pages, and ten of these are illustrated with drawings of the plants, which, with one coloured drawing as a frontispiece, illustrate forty-one species. The drawings are extremely well done, giving an excellent idea of the plants represented. Each one is accompanied by a description in English as well as in Sanscrit, and the synonyms in Sanscrit, Bengali, Hindi, Tamil, and Telugu are given in their English equivalent sounds. The descriptions of the plants are given in simple language, and there is no lack of clearness in the statements concerning the uses of the different parts of the plants. Thus, under Indian baël it is stated that the unripe fruit is a powerful astringent, and is used in dysentery; whilst the ripe fruit is serviceable in habitual costiveness.

The work is evidently printed by native workmen, and we might guess it to be corrected by a native reader, for the mistakes in English spelling are numerous, and the punctuation not all that could be desired; yet in no case is the meaning obscure. The classification is probably founded on an alphabetical arrangement of the Hindu names, and will be useless to Europeans until the index is published, as the plants of the same natural order are not even placed in sequence; for instance, an artocarpaceous and an apocynaceous plant intervene between two solanaceous species. Nevertheless, if the index is carefully prepared the work cannot fail to be useful to both natives and Europeans, and, indeed, so far as illustrations of Indian medicinal plants go, the writer knows of no work that can answer the same purpose in the same way. It will be worth the while of all merchants and medical men interested in Indian medicinal plants to obtain a copy of it, and to excuse the spelling on account of the practical value of the information contained in it and the truthfulness of the illustrations.

Correspondence.

THE MAJOR EXAMINATION.

Sir,—I think the suggestions of "M.F.C.S." and "An Associate in Business" excellent. I am one of those "Minor men" who would gladly avail themselves of such a scheme. After a year's preparation at evening classes, with private study, I have, for six months, been compelled to relinquish study. The demands of business and cessation of the only evening classes within my reach have been the combined cause. If the suggestion of "M.F.C.S." had been in force my year's study would have gone far to prepare me thoroughly in one subject at least. Then the compulsory break in my studies would not have seemed to me so disastrous. I detest cram, and when I started work for the Major I was prepared to spend two or three years in continuous study. I could not foresee the circumstances of the last six months. I might add that when I passed the Minor in 1877 it was simply impossible to proceed to the Major. I had spent all I possessed and more. I believe there are many men like myself who have never wholly relinquished the dream of passing the Major. I also believe that they are the men who have a real interest in the scientific aspect of our profession, and scorn the mere passing of an examination by a system of cram.

ANOTHER ASSOCIATE IN BUSINESS.

SHOULD DOCTORS DISPENSE?

Sir,—I have not read the letters of your correspondents on this subject, but my attention was called to a communication made by Mr. Charles E. Whittaker; whose remarks are by no means novel, in fact, I think he entertains an opinion that is shared by a great number of people, viz., that doctors are even more fitted to dispense medicines than chemists. The people that harbour this idea are by no means very competent judges. There are a great many doctors and chemists who know exactly how this matter stands, but for some reason or another they refrain from giving us the benefit of their knowledge. The class of men I more particularly refer to are those that have satisfied the requirements of both medical and chemists' Examining Boards. Some three years ago I underwent the ordeal that is required by the conjoint board for England and Wales. To compare the pharmaceutical portion of this examination with the Minor, much less the Major, would be absurd to a degree. To allow the young men who have only fulfilled the requirements of this board (viz., devoting a portion of three months to master all the details contained in Proctor, Maisch, and Pereira) to enter into business and compete with the chemist who has devoted his life to the work and passed much more stringent examinations is not only unfair, but is bordering on the ridiculous. Beside all this, for many reasons it is manifestly obvious to most people that the dispenser of medicines should not have the power to write the death certificate, considering the vastness of the fields in both medicine and surgery proper. I think the medical man who has the interest of his patients at heart will find little or no time to tinker and quack in pharmacy when the work can be properly and effectually carried out by the men who have made this branch their special study. As to the knowledge of botany your correspondent dilates upon, I may inform him that he is also wrong on this point, as there is no such knowledge required of medical students.

53, Great Marylebone Street.

THOMAS C. REECE.

GLYCERIN OF THE MARKET.

Sir,—In an article on "Glycerin of the Market," by J. L. Tegarden, re-published in your issue of the 16th inst. (page 801), there is a reference to me which so curiously misrepresents my opinions that I shall be obliged if you will afford me space to correct the statement made. On page 802 Mr. Tegarden says, "It has been stated by good authority that distilled glycerin would not be contaminated with arsenic. A. H. Allen, in discussing the subject in the British Pharmaceutical Conference at Leeds in 1892, seemed to entertain some doubts about it, yet in his concluding remarks he distinctly states that it can be removed by distillation." On looking up the report of the discussion to refresh my memory as to what I really did say, I find that the Conference met at Leeds in 1890, not 1892. Secondly, I did not take any part at all in the discussion at Leeds. I did speak in 1889 at Newcastle, and from the report (*Pharm. Journal* [8], xx., 278-279) it is quite clear that I distinguished between glycerin resulting from the saponification of fats by superheated steam, with or without the addition of lime, and glycerin recovered from spent soap lye. These liquors were commonly neutralised by arsenical acid, and the glycerin was liable to be contaminated with arsenic. On the other hand, no acid was employed in the steam process, and hence an arsenic-free glycerin was produced. I "did not think distillation would remove any arsenious acid previously existing in the glycerin." I "was rather under the impression that the arsenic would go over with the glycerin if it were once in it." How, from these and similar observations, Mr. Tegarden got the idea that I distinctly stated that arsenic could be removed from glycerin by distillation is a mystery which he may be able to explain. I cannot.

Sheffield.

ALFRED H. ALLEN.

PHARMACOLOGY AND THERAPEUTICS.

Sir,—There is a fact occasionally observed in the pharmaceutical laboratory, which I think is confirmatory of the soundness of the position you have taken up in the article in your last issue. Pharmacologists state that nitrite of ethyl and nitrite of amyl have the same physiological action, differing only in degree, yet inhalation of the vapour of the former causes blanching of the face and a depressed pulse; while the vapour of the latter produces flushing of the face and a bounding pulse. These phenomena may be due to the same pharmacological action, but one of the effects is evidently very different.

Edinburgh.

D. B. DOTT.

Answers to Correspondents.

G. Roberts.—You will probably find Quain's 'Dictionary of Medicine' (Longmans, Green, and Co.) the most satisfactory reference book on the subject.

J. B. Barnes.—Thanks for your expression of opinion, which will be borne in mind.

F. D. Fisher.—Your letter will be forwarded to the reviewer.

Corrections.—Mr. J. C. Umney requests us to make the following additions to his remarks published in last week's Journal: On page 806, column 2, line 8, for "and" read "the extract of which"; and on page 807, column 2, line 20, before "B. betulina" insert "oils of."

COMMUNICATIONS received from Messrs. Allen, Barnes, Blackburn, Brayshaw, Dott, Fisher, Goldby, Hill, Jones, McBain, Merck, Michell, Wyleys.

"THE MONTH."

Sulphides of Znq.

A. Villiers shows that precipitated zinc sulphide may be obtained in two varieties possessing the same composition. Each of them may exist in different degrees of hydration, but they are completely distinct, and cannot be directly transformed into each other between zero and 100°. The acid sulphide is obtained in an amorphous form by the action of hydrogen sulphide upon an alkaline solution of sodium zincate. By the action of heat the precipitate appears to assume a crystalline form, but this point is not quite clear, though there is undoubtedly some modification effected. The solubility of both forms of the acid sulphide in aqueous hydrogen sulphide solution distinguishes it from the basic sulphide, which may exist in both amorphous and crystalline conditions, and is precipitated from an acid solution of a zinc salt by hydrogen sulphide. The crystalline variety, which is completely insoluble in aqueous hydrogen sulphide solution, is usually precipitated from a solution of zinc sulphate, and the amorphous, which is but slightly soluble, from the acetate. This second form can be transformed into the crystalline variety by the action of heat (*Comp. rend.*, cxx., 498).

Tropéines.

A number of acid esters of tropine are described by E. Merck. ACETYL-TROPEINE, $C_8H_{14}NO \cdot CO \cdot CH_3$, is a syrupy fluid, obtained by boiling tropine in acetic anhydride, adding ammonia, and shaking with chloroform. It boils at 235°-237° without decomposition, and is soluble in water, alcohol, or ether. The gold salt melts at 193°. LACTYL-TROPEINE, $C_8H_{14}NO \cdot CO \cdot CH(OH) \cdot CH_3$, occurs on acting on tropine with lactic acid or ester, and forms white concentric bundles of crystals which melt at 74°-75°, and are readily soluble in water, alcohol, ether, chloroform, etc. It produces no mydriatic effect, but is said to exercise a beneficial influence on the heart's action. The hydrochloride, hydriodate, nitrate, sulphate, and gold salt (m.p. 143°-146°) have been prepared. SUCCINYL-TROPEINE ($C_8H_{14}NO \cdot CO \cdot CH_2$), is obtained by repeated evaporation of tropine succinate with diluted hydrochloric acid, or by the action of succinic chloride or anhydride on tropine. The hydrobromide and gold salt have been obtained in this case, as well as in those of MALYL-TROPEINE, TARTEYL-TROPEINE, and HIPPUREYL-TROPEINE. *p*-METHYL-BROMATROPINE, $C_9H_{14}NO \cdot CO \cdot CH(OH) \cdot C_6H_4 \cdot CH_3$, has also been obtained by repeated fusion of tropine para-methyl-amygdalate with diluted hydrochloric acid. It is a syrup which eventually crystallises, and forms a gold salt in needle-clusters (m.p. of crystals 192°-193°) (*Bericht*, 1894, p. 7.).

Scopoleines.

Only one ester of scopoline, i.e., scopolamine, $C_{17}H_{21}NO_3$, the scopoline of tropic acid, is known to exist in nature, and that is probably identical with hyoscyne. E. Merck now publishes some observations made during the preparation of various compounds of the same class. ACETYL-SCOPOLEINE, $C_8H_{13}NO_2 \cdot CO \cdot CH_3$, occurs in white crystals, which melt at 53° and distil at 250°. It is obtained as a hydrochloride or acetate by the action of acetyl chloride or acetic anhydride on scopoline. It dissolves in chloroform, ether, and alcohol. The gold

salt melts at 195°-197°. BENZOYL-SCOPOLEINE, $C_8H_{13}NO_2 \cdot CO \cdot C_6H_5$, is prepared as hydrochloride from benzoyl chloride and scopoline. The crystals melt at 68°-70°, and the hydrochloride, hydrobromide, and picrate, as well as the platinum, gold, and mercury salts have been obtained. CINNAMYL-SCOPOLEINE, $C_8H_{13}NO_2 \cdot CO \cdot CH \cdot CH \cdot C_6H_5$, is a colourless syrup, which gradually crystallises, and is readily soluble in chloroform, rectified spirit, and ether. The hydrobromide and nitrate both form white crystals (*Bericht*, 1894, p. 15).

Volume of Salts in Solution.

L. de Boisbaudran refers to Charpy's confirmation of the generality of the rule that when aqueous solutions of salts are diluted with water, there is a diminution of the total volume. This is held to prove that the volume occupied by a given weight of a salt is greater in proportion as the solution is more concentrated, assuming that the volume of water is constant. With the exception of certain ammoniacal compounds, all mineral salts show evidence of contraction on solution in water. Thus, Charpy states that ammonium chloride and some other salts of the same base are the only bodies of which the solution is accompanied by an increase in the total volume. Sodium acetate seems to Boisbaudran to form a connecting link in this respect between ammonium chloride and the generality of mineral salts. All the salts he has examined also—except sodium sulphate, $Na_2SO_4 \cdot 10 Aq.$ —show, at the ordinary temperature, a contraction of volume on crystallisation from supersaturated solutions—sodium acetate, hyposulphite, monosulphide, and carbonate; magnesium sulphate, alums, ammonium nitrate, and silver nitrate. In the case of sodium sulphate, it is difficult to prepare extremely supersaturated solutions, and a slight expansion was always observed on crystallisation (*Comp. rend.*, cxx., 539).

Assay of Formaldehyde Solutions.

Brochet and Cambier show that the addition of formic aldehyde to a solution of hydroxylamine hydrochlorate results in the total decomposition of the salt into formaldoxime, hydrochloric acid, and water, as represented by the following equation:— $NH_2OH \cdot HCl + CH_2O = CH_2:N \cdot OH + H_2O + HCl$. Under certain conditions tri-oximido-methylene ($CH_2:N \cdot OH$), a triple polymer of formaldoxime, is formed. It is stated that by employing an excess of a solution of hydroxylamine hydrochlorate of known strength, and subsequently titrating the acid liberated, a good method is afforded of indirectly determining the strength of solutions of formic aldehyde. The end reaction is clearly indicated by means of methyl-orange. Monomethylamine hydrochlorate acted upon by formic aldehyde is also shown to be converted into trimethylene-triamine (*Comp. rend.*, cxx., 449).

Formaldehyde and Salts of NH_4 .

Brochet and Cambier, having proved that formic aldehyde converts monomethylamine and hydroxylamine hydrochlorates into trimethylene-triamine hydrochlorate and formaldoxime, respectively, show that a similar reaction occurs when it acts upon ammonium chloride. In the cold the solution becomes strongly acid and capable of dissolving calcium phosphate, chalk, etc. Trimethylene-triamine hydrochlorate appears to be first formed, but the final product of the reaction is hexa-methylene-amine, a

solution of which, when treated with an excess of hydrochloric acid, yields crystals of ammonium chloride anew. When the reaction takes place under the influence of heat the final product is trimethylamine hydrochlorate. In the case of ammonium sulphate, Plöchl has shown that the corresponding salt of trimethylamine is formed, and it is said that other salts of ammonium yield similar results (*Comp. rend.*, cxx., 557).

Constituents of Oyster-Shells.

Chatin and Muntz have analysed oyster-shells, and find they contain nitrogen (from residual organic matter), silica, calcium, sulphur (partly as sulphate), magnesium, manganese, iron, animal matter, fluorine, bromine, and iodine, but not a trace of chlorine. The calcium and magnesium are combined with carbon dioxide, and phosphoric acid was also indicated. It is suggested that the presence of these varied constituents accounts in great measure for the reputation enjoyed by oyster-shells in agriculture and the ancient therapeia (*Comp. rend.*, cxx., 531).

Phenol and Aluminium.

M. Balland has found, as the result of experiments, that crystallised phenol and its alcoholic solution have no sensible action upon aluminium at temperatures about 60° to 70°. He suggests, therefore, that aluminium receptacles made without seams might prove more serviceable than glass bottles for conveying the phenol, particularly in time of war (*Journ. de Pharm.* [6], i., 309).

Artemisin.

E. Merck describes this as a new substance, resembling santonin, which separates from the last mother liquor left after treating the seeds (?capitula) of *Artemisia maritima*. The crystalline powder obtained forms a compound with chloroform, but on heating the resulting crystalline mass to 80° C. the chloroform is driven off, and subsequent re-crystallisation of the artemisin from alcohol leaves a product quite free from santonin. Artemisin melts at 200°, and dissolves in 60 parts of boiling water to form a neutral solution from which it separates in needles on cooling. It is soluble in three parts of boiling absolute alcohol, and has the specific rotation $[\alpha]_D = 84.3$. Exposed to sunlight artemisin turns yellowish, but much more slowly than santonin, and whereas santonin, when dissolved in sulphuric acid and water (0.1 Gm. to 1 C.c. H_2SO_4 and 1 C.c. Aq.), and heated after the addition of a drop of ferric chloride, imparts a characteristic violet tint to the solution, artemisin under similar conditions turns the solution slightly turbid and gives it a vivid yellowish-brown coloration. The results of analysis show that artemisin is probably oxy-santonin, having the formula $C_{15}H_{18}O_4$ (*Bericht*, 1894, p. 3).

Alcohol in Crystals.

F. Roques has sought to prepare examples of salts containing alcohol in lieu of water of crystallisation. Such a compound, strontium bromide with alcohol, was recently described by Fonzès-Diacon, and Roques now describes a similar preparation of calcium bromide. It forms fine tabular, rhomboidal crystals of the composition $CaBr_2 \cdot 3C_2H_5O$, corresponding with the variety of calcium chloride described by Heindl— $CaCl_2 \cdot 3C_2H_5O$. When the crystals are calcined the following decomposition occurs:—

$CaBr_2 \cdot C_2H_5O = CaO + C_2H_5Br + HBr$,
ethyl bromide and hydrobromic acid being formed.

They are also very hygroscopic, and when brought in contact with a flame swell up and burn (*Journ. de Pharm.* [6], i., 301).

Paucine.

The alkaloid paucine is obtained from 'pauc-nuts' (*graines d'Ovala*), the fruit of *Pentaclethra macrophylla*. It occurs in yellow flakes melting at 126° C., at which temperature it decomposes, is insoluble in ether or chloroform, and can be crystallised from hot water, decomposing immediately, however, and turning green. Warm rectified spirit also affects it, and in alkaline solution it gives a play of colours—brownish red, dark brown, etc. E. Merck gives the formula indicated by analytical data, obtained on investigation of the hydrochloride, as $C_{27}H_{33}N_3O_5 + 6\frac{1}{2}H_2O$. The hydrochloride forms white needles (m.p. 245–247°), soluble with some difficulty in cold water. The platinum salt melts with decomposition at 185°, and the picrate crystallises in garnet-coloured prisms, which are sparingly soluble in cold water and decompose about 200° after turning black (*Bericht*, 1894, p. 11).

Quassol.

This substance is described by E. Merck as separating from quassin by solution in ether. When purified, it crystallises from alcohol in white flakes which are moderately soluble in ether and chloroform, sparingly so in alcohol, and not at all in water. The crystals melt at 149°–151°, and the optical rotation amounted to $[\alpha]_D = 42.6$. Quassol is distinguished from quassin by its tastelessness, and is probably represented by the formula $C_{40}H_{70}O$, or $C_{40}H_{70}O + H_2O$ (*Bericht*, 1894, p. 18).

Some New Double Iodides.

A. Mosnier describes some combinations of lead iodide with organic or other metallic iodides. A double iodide of lead and ammonium was obtained in fine crystals, of which the formula is represented as $3PbI_2 \cdot 4NH_4I \cdot 6H_2O$. With the iodides of tetra-methyl-ammonium, tetra-ethyl-ammonium, and phenyl-ammonium, compounds were formed, having the formulæ $3PbI_2 \cdot (CH_3)_4I$; $3PbI_2 \cdot 4(C_2H_5)_4I$; and $3PbI_2 \cdot 4[(C_6H_5)_3H_3]I$, respectively. There are several double iodides of lead and sodium, and a new one obtained has the formula $2NaI \cdot PbI_2 \cdot 6H_2O$. It occurs in fine citron-yellow transparent crystals. Lead and lithium iodide is represented as $2LiI \cdot PbI_2 \cdot 4H_2O$, whilst the introduction of metals of the alkaline earths gives compounds corresponding to the general formula— $2PbI_2 \cdot MI_2 \cdot 7H_2O$ (*Comp. rend.*, cxx., 444).

Daturic Acid.

The existence of this fatty acid having been doubted in certain quarters, E. Gérard adduces evidence to prove that his former communication on the subject (*Comp. rend.*, cxi., 305), was fully justified by the facts of the case. He points out that Noerdlinger and Wanklyn and Johnstone, working by different methods, have isolated an acid of the same formula, $C_{17}H_{33}O_2$, as that he ascribed to daturic acid which occupies a position between palmitic and stearic acids, and forms salts with magnesium, lead, copper, barium, and zinc, all of which can be crystallised from alcohol. Neutral sodium daturate decomposes in the presence of water, sodium bi-daturate being formed. The acid salt washed with ether yields the neutral salt and free acid, whilst similar results are obtained with the potassium compounds (*Comp. rend.*, cxx., 565).

Diffusion of Perfumes. J. Passy considers that the fixation of perfumes by solid bodies, when diffused in an enclosed space, must be due to a process of solution similar to that by which dyes are fixed in tissues. He argues that, in the same way that crystallised fuchsine is greenish with a metallic lustre, and only manifests its characteristic colour when in solution, so coumarin in the crystalline state does not present its characteristic odour. Presumably, therefore, tissues perfumed by coumarin contain it, as it were, in solution (*Comp. rend.*, cxx., 513).

Coagulation of Albumin. Coagulable albuminoid substances are found by Ramsden to become converted into solid masses by simple agitation, whether in acid, neutral, or alkaline solutions, and independently of the presence of oxygen, hydrogen, nitrogen, or carbon dioxide. The coagulation is not due to the generation of heat, as it takes place indifferently at all temperatures, and has even been produced in the case of solutions (ammonium albuminate and casein in lime water) which do not coagulate on boiling. In addition, the coagulum produced differs in composition and properties from that obtained by the action of heat. Fresh serum, when alkaline, is but slightly affected by agitation, but the presence of acids or salts favours coagulation (*Archiv. für Physiol. and Journ. de Pharm.* [6], I., 325).

Adherence of Metals to Glass, etc. C. Margot finds that aluminium, magnesium, cadmium, and zinc possess the property of marking glass and other substances containing much silica, in such a way that neither rubbing nor ordinary washing will remove the marks. Taking advantage of this curious property he has constructed pencils and wheels of aluminium, by means of which designs can be drawn upon glass, and it is understood that mirrors, etc., now being sold in London, which reveal figures and various devices when breathed upon, are prepared in this way. The effect is much the same as when sketches are drawn on glass with French chalk, but more permanent (*Arch. Soc. Phys. et Nat. de Genève and Journ. de Pharm.* [6], I., 263).

Adulteration of Beeswax. L. F. Kebler (*Amer. Journ. Pharm.*, lxvii., 141), states that highly adulterated beeswax appears to be common in his district of the United States, some containing as much as 80 p.c. of paraffin. Black earthy matter also is moulded into cakes and cleverly coated with yellow wax, whilst other samples contain chrome yellow, mineral matter, resin, etc. Four specimens recently examined were composed of resin, chrome yellow, yellow ochre, hæmatite, mineral wax, and a little beeswax. A fifth was composed of about equal parts of mineral wax and beeswax. The analytical data are given in the following table, where No. 1 represents a beeswax of known purity, for comparison:—

Exchanges of CO₂ in Plants.

F. F. Blackman, in a paper read before the Royal Society, describes a new method for investigating the evolution and assimilation of carbon dioxide by plants, based on the use of an apparatus in which a high degree of chemical accuracy is combined with special adaptability to biological research. Thus, the evolution of the gas by a single germinating seed, or a small area of a foliage leaf, can be accurately determined from hour to hour without a break, for any desired time. On the other hand, the more active absorption of carbon dioxide in assimilation can be easily determined for as short a period as fifteen minutes, and that at the same time for the two surfaces of one and the same leaf area. The actual determination is based on the absorption of carbon dioxide by baryta solution and titration with hydrochloric acid. Less than 15 C.c. of the solution is employed in each experiment, and after the absorption the whole of this is titrated with alkali in the tube in which the absorption has taken place. Two currents of air pass continuously through the apparatus, entering it through an arrangement for removing carbon dioxide when working on respiration, or through one for adding that gas when working on assimilation. The current is supplied to the plant at strictly atmospheric pressure, thus avoiding any risk of drawing gases mechanically out of the part under investigation. In experiments of short duration 1/50 C.c. of carbon dioxide was found to be sufficient for a trustworthy determination from which definite conclusions may be drawn. As the result of a series of experiments, in which the new method of determination was employed, it was proved that, under normal conditions, the stomata practically constitute the sole pathway for carbon dioxide into or out of the leaf, and the same probably holds for oxygen and the whole of the gas exchange in plants. Passage by osmosis through the cuticle may take place, however, when the stomata or intercellular spaces are blocked and the surrounding tension of the gas is great enough (*Proc. Royal Soc.*, lvii., 162).

C. Timiriazeff claims that the substance described by Monteverde in the *Acta Horti Petropolitani* (see ante, p. 357) as a new derivative of chlorophyll, and named "protochlorophyll," is identical with the "protophyllin" discovered by himself in etiolated plants some years ago (*Comp. rend.*, cix., 414). Both are transformed into chlorophyll in the living plant, as the effect of oxidation in the presence of light; neither presents the spectrum of chlorophyll; both are colourless in dilute solutions, but yellow or red when the solutions are concentrated; these concentrated solutions in both cases are distinguished by the presence of the same band in the spectrum; and both possess a faint reddish fluorescence (*Comp. rend.*, cxx., 467).

No.	M.P.	S.G. at 15° C.	Acid Number.	Ether Number.	Total.	Ratio.	Adulterants.
1	63° 8 C.	0.964	19.60	75.60	95.20	3.857	—
2	48°	0.925	25.13	48.30	73.43	1.122	Resin, paraffin, chrome yellow.
3	52°	0.910	4.20	12.60	16.80	3.000	Y. ochre, earthy matter, paraffin.
4	55°	0.925	4.61	16.10	20.71	3.492	Earthy matter, paraffin, hæmatite.
5	66°	0.935	11.20	37.61	48.81	3.358	Mineral wax.
6	74°	0.921	10.50	19.60	30.10	1.866	Mineral wax.

DECOMPOSITION OF ALCOHOL-REDUCED CHLOROFORM.

BY DAVID BROWN AND D. RAINY BROWN.

Dr. Schacht and Biltz, in a paper published in the *Pharm. Journal* [3], xxiii., p. 1005, say "decomposition cannot be detected in alcohol-reduced chloroform until all the added alcohol has been consumed."

One of us took exception to this statement (*Pharm. Journal* [3], xxiv., p. 321), and showed that after decomposition had been recognised by zinc iodide and starch, as well as by baryta water, reactions were obtained with 1 in 2000 dichromate solution, and the iodoform test, similar to those produced by alcohol, and these were ascribed to the presence of that substance.

Dr. Schacht has since published another article on the subject in the *Berichten der Pharmaceutischen Gesellschaft*, October, 1894, in which he defends his position, and says that the reactions obtained were not produced by alcohol, but by two substances—chloric ether and phosgen-alcoholid.

Unfortunately he produces no evidence of the production or the existence of these substances in decomposing alcohol-reduced chloroform. He arrives at his conclusion simply from an examination of the behaviour of bought ethyl chloride, which he does not prove to be free from alcohol, and of chloroformic ether, prepared by adding alcohol to phosgene and to decomposed chloroform, which may also have contained alcohol.

On the ground alone that he has omitted to demonstrate the production of ethyl chloride and chloroformic ether in decomposing alcohol-reduced chloroform, we would be perfectly justified in refusing to accept his statement. There is, however, no necessity for taking up this position; our knowledge of the decomposition products of chloroform being only qualitative, there is no difficulty in imagining that these as well as other substances may be produced. In order to follow up the subject we are willing to suppose they are, and further, that they existed in the chloroform we examined.

Briefly the results on which the objection to their statement was based are these:—

1. Decomposed chloroforms which originally contained 0.077 per cent., 0.25 per cent., and two samples each containing 0.66 per cent. of alcohol, were found when mixed with 1/2 volume of 1 in 2000 dichromate solution to bleach it in from 15 to 45 minutes, and the water washings of the chloroform gave an unmistakable iodoform reaction.
2. Nothing abnormal was detected in the odour of the samples until zinc iodide and starch reacted.
3. Silver nitrate solution only gave a faint turbidity, and
4. Ethyl chloride gave no iodoform, neither did it bleach the dichromate solution, even after twenty-four hours' contact.

If Schacht is correct, the following changes should readily be observed in decomposing alcohol-reduced chloroform:—

1. A marked difference in the odour of the chloroform, before zinc iodide and starch shows decomposition to have taken place.

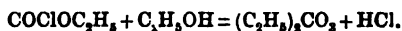
2. A quantity of chlorine should be produced at the time zinc iodide and starch begins to react, sufficient to combine with all the added alcohol; and
3. That ethyl chloride and chloroformic ether, in quantities which could be produced by 0.077 per cent. of alcohol in chloroform, give reactions with 1 in 2000 dichromate solution and the iodoform test, identical with those produced by alcohol.

How far these conditions are found to exist will be seen from the following results. Trained noses have not hitherto succeeded in detecting any difference in the odour of decomposing chloroform until zinc iodide and starch reacts. If 0.1474 per cent. of chloroformic ether and 0.2629 per cent. of ethyl chloride are produced from a chloroform containing 0.25 per cent. of alcohol, a product is obtained, which it will be found can be at once condemned because of the presence of foreign odours; the quantities may even be reduced to 1/4 without rendering the task of detection a difficult one.

The decomposition products (represented as chlorine) required to convert 0.25 per cent. of alcohol into ethyl chloride and chloroformic ether, should, according to Schacht's theory, be 0.192 per cent. = 0.776 per cent. AgCl. So soon, therefore, as decomposition is detected by zinc iodide and starch, this quantity of chlorine should be obtained by decomposing the products. We have not, however, succeeded in obtaining anything like this quantity. Ten determinations—four of them made so soon as zinc iodide and starch reacted, and the remainder two days afterwards—gave precipitates of silver chloride, ranging from an unweighable turbidity to 0.29 per cent., proving that sufficient chlorine has not been produced to combine with all the added alcohol.

With regard to ethyl chloride, it has already been stated that it gave negative results after twenty-four hours' contact with 1 in 2000 dichromate solution and the iodoform test. The same sample was re-tested, and confirmed the previous results. A sample of German make was examined, but as it bleached the dichromate solution in five minutes, and gave an abundant precipitate of iodoform, the presence of alcohol was suspected, and it was found to be present in considerable quantity. After washing ten times with its own volume of water and drying, a product was obtained which did not bleach the dichromate solution after standing with it for forty-eight hours, again proving that the reaction observed was not produced by ethyl chloride.

Schacht and Biltz prepared their chloroformic ether by adding alcohol to phosgene and to decomposing chloroform, and employed the products without any purification. It will be observed, however, that the reverse of this process holds good in the case of decomposing alcohol-reduced chloroform where phosgene and chlorine in small quantities are slowly added to an excess of alcohol; any chloroformic ether produced by this process would therefore be decomposed by the alcohol present into carbonic ether and hydrochloric acid thus:—



Assuming, however, that it does exist in the chloroform, the following experiments prove that it does

not give reactions which can be mistaken for those of alcohol.

A sample of chloroformic ether prepared by ourselves, sp. gr., 1.141 at 15° C., b.p. 93-95° C., was added to pure chloroform in quantities of 1, 0.5, 0.25, 0.12, 0.06, 0.03 per cent., and tested with 1 in 2000 dichromate solution. The 1 per cent. sample had not bleached the solution in forty-eight hours, but the colour was gone in fifty-six hours; none of the other solutions were bleached in fifty-six hours. Another sample (of German make), which was found to contain alcohol, was washed, dried, and distilled, a product being obtained of sp. gr. 1.140, b.p. 93-95° C. This, when mixed with chloroform in the same proportions as above, did not bleach the dichromate solutions after forty-eight hours' contact.

As carbonic ether is a possible product of decomposition, it was also subjected to the tests applied to the two others, the proportions added to pure chloroform being 1, 0.5, 0.25, 0.06 per cent., but none of the dichromate solutions were bleached after forty-eight hours' contact.

We would point out that all the reactions with decomposing chloroform which led to Schacht and Biltz's statement being disputed were obtained in from 15 to 45 minutes (these have since been confirmed), and that no reactions took place in forty-eight hours with any of those containing the supposed products of decomposition. Whatever may be the result of his further work on the subject, Dr. Schacht has not proved that ethyl chloride and chloroformic ether are produced in decomposing alcohol-reduced chloroform, neither has he shown that they give reactions similar to those of alcohol.

On the other hand we think we have proved that at the time decomposition is first recognised by zinc iodide and starch, chlorine has not been produced in sufficient quantity to combine with all the added alcohol; and we have further shown that in quantities greater than it is possible for them to exist in decomposing ordinary chloroform, neither chloroformic ether, ethyl chloride, nor carbonic ether give reactions which could be mistaken for those of alcohol.

THE BOTANY OF THE BRITISH PHARMACOPOEIA.*

BY J. REYNOLDS GREEN, Esq.D.

Professor of Botany to the Pharmaceutical Society.

In discussing or criticising the botanical work which is contained in the present edition of the Pharmacopoeia, it is important to remember that there is a very great difference between the state of botanical science to-day and that of ten years ago. Not only has much more accurate histological work been published during the interval, but the whole question of botanical nomenclature has been revised, and many plants used in medicine have now been more satisfactorily referred to appropriate genera.

In the remarks I propose to make upon the botany of the Pharmacopoeia, therefore, I wish at the outset to point out that many of the defects existing in the work are not the results of any careless preparation by the editors of the present edition, though they may fairly be remedied by those responsible for the new one which is pending.

The extent to which botanical detail should be admitted to a Pharmacopoeia is one which may be the subject of some controversy. I think all will agree, however, that so much at least should be given that the plant or the part of the plant described should be easily recognised by the pharmacist. The identification should in the first instance be based upon macroscopic characters, and these should be set forth in sufficient detail to enable an observer to distinguish the plant with accuracy from the adulterations which either have been or may easily be mixed with it. Detailed directions for the detection and recognition of these adulterations seem hardly necessary provided that sufficient positive characters of the drug are recorded.

Macroscopic characters are, however, in many cases insufficient; in such cases microscopic characters should also be given. It is difficult, for instance, to be certain of the identification of the leaves of *Atropa belladonna*, or of those of *Digitalis purpurea* by a description of their external features only. Their internal structure, taken in conjunction with their external features, however, enables recognition to be positive. Belladonna leaves contain in certain of their cells aggregations of minute crystals of calcium oxalate, looking under the microscope almost like grains of sand. These are very distinctive. The leaves of digitalis contain no crystals, but are furnished with curiously shaped hairs, which are very distinctive tests of identity. The peculiarities of the epidermal cells of the leaves of senna and the characters of the hairs upon them are distinguishing marks which might well supplement the description of the form of the leaves. Nor is it only in the case of leaves that such anatomical details are desirable. The bark of the two species of *Rhamnus* may be mentioned. In that of *R. purshiana* patches of sclerenchyma are to be seen plentifully scattered through the tissue; in that of *R. frangula* there is little or no sclerenchyma. The root of scammony would be identified with greater certainty by regarding the form of the starch grains which it contains, which are peculiar in shape and characteristic of this plant.

Even description of microscopic features in certain cases fails to ensure identification. The fruits of various plants of the natural order Umbelliferae are very important in medicinal preparations, and their diagnosis from merely verbal description is extremely difficult. The natural order is a large one, and one of its principal marks is the structure of the fruit. This consists of a cremocarp, splitting when ripe into two mericarps, which show peculiar arrangements of ridges on their external surfaces, various shapes of the endosperm they contain, and groups of peculiar oil glands or vittæ in the capillary walls.

The different genera, though agreeing in general arrangement and structure of the fruit, can only be distinguished from each other by minute details or variations of shape, size, and distribution of these three characteristic structures. So much alike are many of them, that language alone fails to indicate their differences. The ridges must be described by

* Reprinted from the *British Medical Journal*, for March 23.

somewhat vague terms, such as blunt, acute, broad, narrow, etc.; the whole fruit may be called flattened, or roundish, or ovoid; the endosperm described as curved or straight, and so on. But, however such a general description may be worded, many of these fruits would fit in with it, and mere verbal indications of the relations are therefore not sufficient for identification. The description of the dill fruit (*Pseudanum graveolens*) is thus given: "Broadly oval, about one-sixth of an inch long, flat, and surrounded by a broad membranous border. It has a brown colour, the membranous border being paler. The half fruits or mericarps are usually distinct in the fruits of commerce. Odour and taste agreeably aromatic." A great many of the umbelliferous fruits would correspond fairly well to such a description. The description of the hemlock fruit is a little more detailed: "About one-eighth of an inch long, broadly ovoid, somewhat compressed laterally, and crowned by the depressed stylopod, dull greenish-grey. As met with in commerce, it consists usually of the separated mericarps, each of which presents five prominent more or less crenated ridges, with the furrows smooth, and without evident vittæ. Reduced to powder, and rubbed with solution of potash, it gives out a very strong and disagreeable odour." Anyone attempting to identify a fruit from this description alone would speedily find how vague and indefinite the points are, and how many fruits would fit in with them.

In the case of these fruits it must also be borne in mind that the recognition must not be confined to the few which are used in medicine, but must be so accurate as to ensure that others of the British flora are not confounded with them in practice, many of these being extremely poisonous.

In the case of such structures as these umbelliferous fruits a figure of the particular one under description would be very valuable. The position and shape of the ridges, the characters of the endosperm and of the vittæ, could be depicted therein with accuracy, and much space saved in the descriptive text. If a diagram of the whole fruit and of its transverse section were inserted it would occupy but little space. Indeed, this mode of indicating characters might be extended to many other fruits used by pharmacists. It may, of course, be argued that the introduction of figures into a Pharmacopœia would lead to too great an addition to its volume. The question of space is naturally worth careful consideration, but if the figures were inserted the description need not be so lengthy as under the present conditions, and considerable assistance would be afforded for accurate diagnosis.

On looking carefully through the descriptions of plants and parts of plants which are found in the present volume, one can hardly help noticing a certain looseness or indefiniteness, which might well be avoided in future. The vagueness of the description of the dill fruit has already been noticed; there are many other instances. The fig is described as the dried "fruit" of *Ficus carica*, and is said to consist "of the enlarged hollow succulent receptacle, bearing very numerous seed-like achenes on its inner surface."

If this description is to be taken in a botanical sense it is altogether inaccurate. The structure called the "fruit" is not a botanical fruit at all, but an inflorescence. The true fruits are curiously spoken of as "seed-like achenes." Why seed-like? What sort of seed do they resemble? Structurally none; in appearance few. Seeds include all sorts of forms from a broad bean to a poppy seed. The term "seed-like" is therefore not definite; nor is it necessary, for an achene is a much more constant structure than a seed.

The description of the lettuce, on page 219, is noteworthy: "The flowering herb of *Lactuca virosa* (Linn); 'Bentl. and Trim. Med. Pl.,' vol. iii., plate 160." Surely, if the Pharmacopœia is to have a description of the plant at all, this does not meet the case. To identify the plant the unlucky pharmacist must procure a copy of a botanical work not universally accessible—indeed, in many places quite impossible for him to reach.

The same looseness of description is found under the head of conium leaves, page 124. They are said to be "more or less divided in a pinnate manner, the lower leaves decomposed and sometimes two feet in length, glabrous, and arising from a smooth stem, which is marked with dark purple spots, by clasping petioles of varying lengths, those of the lower leaves being hollow. Odour strong and very disagreeable, more especially when rubbed with solution of potash." Such a description would apply to almost any of our British Umbellifere. The only point given which is at all distinctive is the spotting of the stem, and this is very variable, and many stems or parts of stems do not show it. The description of the leaves as "divided in a pinnate manner" is vague and not entirely accurate. The smell has a distinct resemblance to the odour of mice, which should be stated instead of its being called "strong and very disagreeable." A point about conium leaves which is fairly distinctive is that the margins of the young leaflets or segments of the leaves are frequently tinged with white near their points; this is not stated.

The descriptions of certain barks and woods may be similarly criticised. Much that is said of many of them is characteristic of many barks, and might very well be omitted, stress being laid instead on definite peculiarities. In the description of quassia wood on page 341 it is said to be "dense, tough, porous, and of a pale yellowish-white colour." It is a little difficult to see how it can be at once dense and porous; the two things vary inversely; the more porous a wood is the less is its density. Again, the material is said to be "the chips, shavings, or raspings of the wood of *Picraea excoelaa*," and the first character given for identification is "in billets or logs, varying in length and size, but frequently as thick as a man's thigh, and covered by a dark grey bark."

In the present volume no description is given of the microscopic characters of powdered drugs. When we consider that in the present day most pharmacists purchase many drugs in the condition of powders, it appears desirable that they should be able to identify the powder apart from the drug in the unaltered condition. This can be done only by a microscopic

examination. Many of the constituents of vegetable tissues have a very definite value in this respect; many starches are extremely distinctive; the tissues of seeds are very unlike those of roots, and so on. It is only necessary here to call attention to a few illustrations of this point. *Ipecacuanha*, when powdered, can be recognised with tolerable certainty by two points—the vascular elements are in the form of perforated tracheids, true vessels being absent; the starch grains are of a peculiar appearance. Jalap in powder again shows distinctive starch grains, peculiar crystals, and numerous resin-containing cells. The powdered seeds of *Strychnos nux-vomica* would be easily identified by the application of the micro-chemical tests for brucine and strychnine.

Many powders need special investigation, of course, to enable accurate diagnostic tests to be ascertained; for example, rhubarb, liquorice, and gentian powders. A new pharmacopœia would be much improved by the introduction of the distinctive features which such powders present, and these could without much difficulty be determined.

Within the last ten years much more accurate information has been obtained on the point of the definite micro-chemical tests which various constituents of vegetable tissues respond to. Those which are given in the present Pharmacopœia are often negative, and some depend on very variable constituents. In the case of many decoctions it is stated that they do or do not give an indigo-blue colour with iodine. This test is of little value as given; it, of course, is only a test for the presence of starch in the drug under discussion. The presence of starch in many roots will depend upon their condition when gathered; the quantity of starch, and therefore the depth of the colour of the decoction, on addition of the iodine, will vary very greatly from time to time. In many cases where this test was said to give a negative result, the reason for applying it is not apparent. The value of the test will depend on its distinguishing the drug under examination from another for which it might be mistaken, which does contain starch. In such a case why should not the two drugs be mentioned as differing in this respect?

Some of the micro-chemical tests given are not only not distinctive, but actually inaccurate. Thus *Cuscuta* bark is said not to give an arterial red coloration when the fractured surface is touched with nitric acid. In many cases this treatment does produce a red colour, though perhaps not quite that of arterial blood. Presumably this test is meant to distinguish *Cuscuta* bark from that of *nux vomica*.

An instance of new tests which are quite distinctive is furnished by cubebæ. When the tissues of the true cubeb are touched with strong sulphuric acid a scarlet colour is produced in consequence of the presence of the active principle. Other cases of a similar kind will be remembered by many botanists.

The differences between the seeds of the two species of *Sinapis* are not accurately stated. It is said that white mustard seeds are inodorous; so are those of black mustard when quite dry. It should be pointed out that the white mustard seeds should be moistened

in order to see whether they give off any distinctive odour.

I have already mentioned that in some cases the nomenclature of the plants is faulty. It is a matter of common knowledge that frequently the same plant has been differently named by different botanists, and it has been necessary to quote more than one appellation. Now that the *Index Kewensis* has been completed no doubt greater accuracy in nomenclature is possible, and in all cases the generally accepted name can be ascertained and used. Though not a very important point, this will no doubt receive, as it deserves, attention.

Meanwhile enough has been said to indicate that in order to render the Pharmacopœia entirely satisfactory from the botanist's point of view, steps should be taken for the careful revision of the botanical details it furnishes.

ALOIN.

BY CHARLES A. SERRÉ, B.Sc.

"The different kinds of aloin vary as much from each other as do the alkaloids of cinchona bark."—'Squibb's Ephemeris,' 1884, 669.

Although the above was written ten years ago, it is equally true to-day, for the U.S. Pharmacopœia gives no guide as to the kind of aloes which should be employed. Yet by common consent all manufacturers take Barbados or Curaçoa aloes, owing to lower initial cost. At this point all similarity ends, for the resulting "aloin" vary all the way from purified aloes to fair samples.

The U.S.P. tests are next to useless from the analyst's point of view, as absence of ash does not denote absence of resin, any more than insolubility in alcohol denotes absence of resin (soluble resin) or mineral salts.

Out of a consumption of at least 20,000 pounds a year, not one twentieth part is used by the pharmacist, most of it being used by wholesale houses for the manufacture of pills, and the necessity of reliable tests is keenly felt. Of this more anon; meanwhile a general idea of its manufacture may not be amiss.

The selected aloes, which should be of a liver colour and clear fracture, are dissolved in water at a temperature not exceeding 40° C. Here it may be observed that some manufacturers use dark-sorted aloes, reserving the better qualities for "selected." This is objectionable, as dark aloes generally prove to be "burnt aloes," which are detrimental to yield an ultimate quality.

To resume: To the above solution, water is added until the operator is satisfied that all insoluble resin has been thrown out. No exact quantity can be given, as atmospheric conditions and skill in operation are dependent factors. The whole is allowed to stand, and the bright solution, concentrated *in vacuo*, set aside in earthenware coolers to crystallise, the mother liquor drawn off; the crystals being pressed and purified by suitable solvents and recrystallisation, thence granulated or powdered in accordance with requirements.

The extraction of final traces of resin can only be

effected with the aid of elaborate mechanical and chemical methods, and cannot be accomplished on a small scale. At the present time the writer would simply demonstrate the various qualities, and for this purpose typical samples from American, English and German makers of "aloin" were obtained and are tabulated as follows:—

	A. American	B American	C. English.	D. German.
	Bright pale	Brown.	Greyish Deep br't	
Colour	yellow.		yellow.	yellow.
Melting point.	116°	140°	145°	142°
	(Softens only.)			
Resin	—	5.8 p.c.	—	—
Ash	—	1.4 p.c.	4.7 p.c.	1.3 p.c.

These figures speak for themselves, but are far from satisfactory from the chemist's point of view, as there are no text-books containing reliable information on a method for determining resin quantitatively and absolutely. The present method is too low, giving negative results in C and D, whereas qualitatively and by colour the grade is apparent.

E. Schmidt's 'Anführliches Lehrbuch der Pharmaceutischen Chemie' gives 142° to 145° as melting point; he evidently must have obtained samples made by the old open evaporation process. The test employed for resin (such as it is)—the precipitation of an ammonio-alcoholic solution with a large volume of ice water—is evidently too merciful, but the best at command.

The ash in B was white and contained no iron, whereas C and D were mostly iron; for the latter in any case there is no excuse if ordinary care is used; to this I attribute the dulness in colour of C.

A very good method of ascertaining if aloin is absolutely free from resin is by adding 20 C.c. of water in a test-tube to one grain of the finely-powdered sample, shaking and allowing to stand one minute. The solution should be perfectly clear. With the exception of A, not one of the above stood the test. All samples not meeting with the requirement should be looked on as suspicious. Ash, of course, is serious, but can easily be detected. The melting point, by which the solubility is affected, should be insisted upon. Until then "aloin" will always be a question of "mixtures" and "abouts."—*Druggists' Circular*.

THE PROFESSIONAL SITUATION IN PHARMACY.*

BY ALBERT B. PRESCOTT, M.D., PH.D.

Dean of the School of Pharmacy, University of Michigan.

The pharmacist had never such need of skill as he has at present. Here in the United States, where most of the professions are as free as air, the laws require a man to have a measure of professional skill before he can so much as offer himself as a pharmacist to the public. The pharmacy laws mean something to every person looking to pharmacy as a pursuit. Whatever their imperfections or shortcomings, these laws, in the simple fact of their persistence, in this country as well as in the older countries of civilisation, mean a great deal as to the character of pharmacy and the kind of skill important for success in it.

The inherent character of a learned profession is shown by the fact that the state requires men to

possess systematic knowledge, that is to say science, before they can take the name of the profession. The special skill of a pursuit is shown to be intellectual skill by the fact that men must study in preparation for state examinations before being licensed for the pursuit. We may say, therefore, that, according to statutes representing public sentiment in this country, it is study that is primary to qualification in pharmacy. And it follows that the professional ability of the pharmacist will increase with the vigour and extent of his studies, and the quality of his means of study, various as these really are. The better and broader the studies, the finer and larger the skill. The more thorough the education, the higher the competence at any given stage of practice in life.

Skill is nourished by studies, and studies are sustained in many ways and want many things: A general education, with the use of language and mathematics and more. Work in colleges and laboratories of pharmacy, with instruction in classes and by lectures. The use of text-books of the science of pharmacy, and published authorities for its practice. The direction of preceptors, and observation with reading in the drug store. Periodicals, the current and continuous publications of pharmaceutical science, making available the researches of masters and experts in all parts of the world. Personal investigation, the consultation of libraries, fellowship in societies, and communication with other workers. Such as these and more are the resources of pharmaceutical study, and go to nourish that skill which is the professional capital of the pharmacist.

Of this skill it may be said, given a barely sufficient quantity of it to pass a state board and be born into the ranks of pharmaceutical existence, on the lower level of the greatest competing numbers: this much does not constitute capital, but it gives a comfortable opportunity to live and by further study to acquire some of the capital of the profession. Every gain of skill above the lower level is a proportional gain of capital for use.

Mercantile businesses suffer from excess of competition, and the mercantile interests of pharmacy share this disadvantage. Manufacturers complain of over-production and financial depression, and pharmaceutical manufacture is not an exception to this complaint. Young men seeking employment or asking better compensation in all vocations meet with discouraging replies. In this state of affairs pharmacy gives very little promise to the young man who will not equip himself with distinct professional skill. In these times it is the thoroughly trained young pharmacist who is not left unemployed. It is the man who has studied pharmacy as a learned profession who has the best places opened to him to-day. And the thorough-going scientific expert is the one man in pharmacy whose prospects are flattering. Furthermore, the work of every such expert creates a demand for more experts, in the growth of the high grade service that gives advantage over common competition. There is a call for men of thorough training, and as fast as such training is put upon trial the call increases.

* Extract from an article in the *Pharmaceutical Era*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MARCH 30, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 6, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, —17, Bloomsbury Square, London, W.C.

POOR LAW DISPENSERS.

SOME interest having been shown and correspondence received on the subject of the remuneration and status of dispensers to workhouses and poor law infirmaries, we propose to examine the subject from the public as well as the professional point of view. The regulations governing the appointment of dispensers to poor law infirmaries and dispensaries, of which there are no less than fifty in London alone, are set out in Arts. 12 and 13 of the Poor Law Board orders on this subject, and are as follows:—

Art. 12.—No person shall be qualified to be appointed a Dispenser unless he shall be a Licentiate of the Apothecaries' Company of London, or shall have been duly registered under the Pharmacy Act, 1868, or some other authority of Law in that behalf.

Art. 13.—The following shall be the duties of a Dispenser:—

No. 1.—To devote his whole time to the service of the Guardians as a Dispenser, and attend at the Dispensary at such hours as the Guardians shall appoint.

No. 2.—To take charge of, and keep carefully and safely, as far as shall be in his power, all drugs, medicines, medical and surgical appliances, and medical stores provided by the Guardians for use in the Dispensary.

No. 3.—To compound and supply all medicines, and supply from the stores under his charge all medical and surgical appliances required by the Medical Officers for use in the discharge of the duties of their office.

No. 4.—To prepare and dispense skilfully and cautiously all prescriptions drawn up and ordered by the Medical Officers, and punctually to supply the medicines when prepared to the persons authorised to receive the same, and, when so required by the prescriptions, to express in writing the proper directions to accompany them.

No. 5.—To keep an account, in a book to be supplied to him by the Guardians, of the drugs, medicines, medicinal and surgical appliances, and medical stores submitted to his charge, and, as nearly as may be, of those consumed or supplied to the paupers, and from time to time to lay the same before the Visiting Committee, and bring under the notice of the Medical Officers or the Visiting Committee the need for further

supply of drugs, medicines, and medical and surgical appliances, as and when such need shall occur.

No. 6.—To assist the Medical officers in keeping the Alphabetical Index of the pauper patients attended.

No. 7.—To file all prescriptions supplied to him by or on account of the paupers or by the Medical Officers, and keep them in the Dispensary for not less than twelve months after their date.

No. 8.—To prepare from time to time, as directed by the Committee, an estimate of any medicines, drugs, medical and surgical appliances, and medical stores which may be required, and a statement as nearly as practicable of the quantities thereof used and issued to the paupers or to the Medical Officers since the preceding estimate and statement, and an account of the quantities thereof remaining in store respectively, and submit the same to the Committee for their perusal; to balance the same quarterly, and to submit the same, made up to the last quarter-day prior to the audit, to the Auditor of the District comprising the Union or Parish at that time.

In one of the annual reports of the Local Government Board it is stated: "The position of the dispensers in these institutions is one of great importance, and it has been thought right in view of the responsible duties assigned to them to sanction some increase in their salaries." The amount of this increase we find was that after four years' service the dispensers (who are appointed at a salary of £120 per annum), are to receive a maximum of £140. This cannot be regarded as a proper amount for educated and skilled dispensers to be the utmost they may look forward to, and we think the Local Government Board would be well advised to sanction a maximum of say £200 per annum after ten or twelve years' service, especially as some Boards of Guardians would do this, did the regulations permit.

The work done in many of the large Infirmaries is very considerable, as we recently pointed out in an article on the Kensington Infirmary (*ante*, p. 361) and it is of public importance that only properly qualified and properly paid dispensers should be employed in all public institutions. It is regrettable to find that this is not always the case. No doubt in some of the smaller unions there is not work for a dispenser to be exclusively employed, but in such cases there are always qualified chemists near, with whom arrangements could be made for the proper discharge of the duties, just as medical officers are appointed to attend daily for a short time to give medical advice. We think a very considerable responsibility will rest upon the local authorities who do not fully comply with the orders of the Poor Law Board should any accidents occur through the ignorance and incompetence of unqualified dispensers of medicine being employed, and would venture to urge upon all such authorities the necessity of providing a reasonable and sufficient salary to secure the services of competent and trustworthy officers, and, of course, that the Local Government Board should sanction the same.

THE ANTITOXIC TREATMENT OF DIPHTHERIA.

MUCH interesting information concerning the new method of treating diphtheria was brought to light at the last two meetings of the Pathological Society, in the course of a discussion introduced by Dr. BERTRAM HUNT. Not the least interesting part of the debate concerned the method of examination of horses before they were chosen as the source of the remedy. Dr. SIMS WOODHEAD explained that before any animal was accepted it was examined by a veterinary expert and passed as being free from any recognisable disease. It was farther tested with the toxins, first of glanders, and then with that of tuberculosis—Koch's tuberculin. Mallein—the toxin of glanders—had been found to be a certain that for this disease. Two or three animals which, as far as could be ascertained by careful physical examination, appeared to be free from disease, were found to be suffering from the disease in a chronic form by the use of mallein, the diagnosis being confirmed by examination of the lungs after the horses had been killed. When the disease is present injection of mallein under the skin causes a swelling which lasts over twenty-four hours, and a rise of temperature. Tuberculin was less certain than mallein, but tubercle was rare in horses.

Mr. WM. ROBERTSON explained in detail the method of preparation of horses by repeated injections of toxin and the manner of obtaining serum from them when they had become antitoxic. The extreme care used to prevent the entry of septic organisms into the blood of the animal, both during the preparatory injections and when the antitoxic blood was being drawn off by a canula, will reassure those who might fear that there would be morbid germs, as well as antitoxin, in the curative serum. Ten litres of blood could be taken from a draught-horse without fear of injuring the animal. The term "pseudo-diphtheria bacillus" raised some discussion. Mr. LENNOX-BROWNE objected to the term since it referred to true diphtheria bacilli which had undergone a process of attenuation, and Dr. SIMS WOODHEAD stated that this modification of the tubercle bacillus was characteristic of convalescence, a fact Dr. HUNT explained by the existence of antitoxin in the blood of diphtheria patients, the antitoxin having the effect of destroying the virulence of the bacilli.

In opening the debate, Dr. HUNT referred to two kinds of immunity—an active kind, brought about by the use of a mitigated virus; and a passive, brought about by the transference of immunity. A child recovered from diphtheria because it formed an antitoxin, but by the use of antitoxin prepared by another animal a transferred protection could be conveyed to the child to help it against the attacks of the bacillus, of which the offensive and defensive weapon was the toxalbumin elaborated in the substance of the bacillus. It was probable

that the toxin stimulated the cells of the animal to prepare the antitoxin. Dr. WASHBOURNE thought that in some points speculation had been carried almost into metaphysical regions. Dr. KANTHACK exhibited sections of the lungs of guinea-pigs in which diphtheria bacilli had been injected into the muscles of the thigh. Even the smallest bronchial tubes contained diphtheritic membrane.

THE SIN OF SUBSTITUTION.

THE *Medical Record*, a transatlantic contemporary, has recently published under the above title several communications received in reference to the suggested dishonesty of certain druggists, and expresses the opinion that though the American dispenser is not an untrustworthy man by nature, there seems to be something in the nature of his business, as conducted in different places, that gradually perverts his moral sense of rectitude and slowly leads to the "crime" of which complaint has been made. It is suggested that the druggist does not begin by being dishonest, but that unless he exercises the greatest and most constant care he is led gradually into an easy way of looking at the physician's rights, until by a graduated course of counter-prescribing, playing the doctor, and recommending something of his own as better than that prescribed, his sense of right becomes so blunted that it is no longer difficult for him to replace an expensive drug or one not in stock with a substitute.

With regard to remedies for this state of affairs, our contemporary considers that it is not expedient for physicians to go generally into the drug business, but that in self-defence the druggist must reform. Pressure is to be brought to bear upon him, to cause this reformation, from physicians and through the schools and boards of pharmacy. They, it is proposed, should take the initiative, and devise some stringent way of dealing with those who in disgracing themselves bring discredit upon their calling. "If examples were made of some of the wrongdoers by legal proceedings much substantial good would be accomplished. It would, of course, entail some trouble in obtaining evidence, but the desirable end would more than justify the means."

It is well known in this country that the relations existing between pharmacists and medical practitioners in the United States are not the best possible, and it is obvious that the writer in the *Medical Record*, in stating his side of the question, probably unconsciously exaggerates, besides omitting causes of offence by his own friends. At any rate, whilst deploring the existence of the practice of substitution as objectionable and unprofessional, it would be interesting to know if American physicians invariably abstain from interfering in an unprofessional manner with the business of pharmacists, and, if not, to what extent they consider themselves justified in so interfering.

A UNIVERSAL LANGUAGE.

A CORRESPONDENT of the *British Medical Journal* writes in no uncertain terms regarding the proposal that Latin should be re-adopted as a universal language for medical men. He "thinks the revival of Latin is a cause which would have pleased Cato but not the gods. For medical men, Latin is not only dead but decomposed. Scholarship stops the nose at the putrid remnants of a so-called classical education, which strew the pages of modern medical literature." Amongst such remnants he quotes *labia*, intended as the plural of *labium*, *gummæ* as the plural of *gumma*, *fenestrum* for *fenestra*, *materia medica* intended as a neuter plural, *bronchiæ* as a plural of *bronchia* which is itself plural, *pubis* for *pubes*. They include also names of the fourth declension—*meatus*, *processus*, *fætus*, etc. with a plural in *i*; and Greek derived nouns in *ma* treated as feminine and of the first declension.

Other examples include numerous terms used by dermatologists, gynecologists, etc., whilst *memoranda* and *phenomena* are often treated as nouns singular. But for the full bloom of barbarism, the curious inquirer may be referred to the pharmacopœia of a certain hospital for women, which might have been published as a 'pill to purge melancholy' in scholars." Similar inaccuracies are frequent in French, Italian, and Spanish medical works, whilst German writers on medicine are described as adding to the uncouthness of the Latin style for which their scholars are notorious, a disregard of the elementary decencies of grammar which is all their own. Americans take the palm, however, for the greatest fertility in the production of barbarism, "as might be expected from the superior inventiveness of that ingenious people."

Considerable doubt is thrown upon the idea that Latin ever was the language of medicine as a science, and this "Philistine" suggests that a good case might be made out for the disuse of Latin having proved a not unimportant help in the advance of medicine. In any case, it is pointed out that it is impossible, even if it were desirable, to revive the use of the language, and that in this matter "the best thing we can do is to leave the dead to bury their dead."

EVENING MEETING IN EDINBURGH.

At the meeting held in the Pharmaceutical Society's house at Edinburgh, on March 22, the first paper read (see p. 836) was a criticism by Messrs. D. and D. R. BROWN of the position taken up by Drs. SCHACHT and BILTZ with reference to the decomposition of alcohol-reduced chloroform. This was followed by an important and exceedingly practical discussion, on somewhat unusual lines, on the proposed Imperial Pharmacopœia. The novelty consisted in the fact that nearly all those who took part in the discussion had embodied their

remarks and criticisms in the form of papers. It seems desirable that all the communications read at the meeting should be published at length, but limitations of space prevent this being done in the present issue of the Journal. A selection has therefore been made, for immediate publication, of those papers that deal with the subject under discussion from a general point of view. The remaining ones, which will be published later, are as follows:—"Note on Chloroform" and "Note on Aloin," by D. RAINY BROWN; "Ointments," by PETER BOA; "Infusions," by WILLIAM LYON; "Pills," by J. I. FRASER; "Extracts," by WILLIAM SWAN; "Waters," by W. S. GLASS; and "Linseed Meal," by ALEXANDER J. DEY. The results of the meeting afford one more valuable illustration of the interest taken by Scottish pharmacists in their chosen profession.

EARLY CLOSING OF SHOPS.

In the Bill to provide for the earlier closing of shops, which has been prepared and introduced into the House of Commons by Sir JOHN LUBBOCK, Mr. CHAMBERLAIN, and others, it is provided in Clause 9 that, in the event of the Bill becoming law, a pharmaceutical chemist or chemist and druggist shall not be liable to any fine for supplying medicines, drugs, or medical appliances, after the hour appointed by an order made under the Act for the closing of shops; but the section shall not be deemed to authorise a pharmaceutical chemist or chemist and druggist to keep open shop after the said hour. The time to be fixed for closing shops may on any one specified day of the week be any hour not earlier than 1 p.m., but on other days shall not be earlier than 6 p.m. The local authority of any district shall have power to make the necessary order on being served with an application in writing, signed by not less than two-thirds the number of occupiers of shops affected in the district, and the order may only be revoked when more than one-third of such occupiers are opposed to its continuance. The penalties under the proposed Act are a fine not exceeding five shillings for the first conviction, twenty shillings for the second, and five pounds in the case of a third or subsequent conviction. Agents and servants committing offences under the Act will be liable to the same fines as if they were occupiers, and the provisions of the Act are to be enforced by the police authorities. The Bill has been read a second time, and evidence is now being received by a Select Committee of the House of Commons, in connection with it.

THE BOTANY OF THE PHARMACOPŒIA.

An excellent and practical article on this topic is contributed to the *British Medical Journal* for March 23, by Professor J. REYNOLDS GREEN. Special prominence is given to the inadequate nature of the existing botanical descriptions, and to the advisability of introducing histological characters in the next edition of the Pharmacopœia. The paper is reproduced at length at page 837.

Transactions of the Pharmaceutical Society of Great Britain.

SCHOOL OF PHARMACY PRIZE EXAMINATION QUESTIONS.

Session 1894-95—Winter Course.

PRACTICAL BOTANY.

PROFESSOR GREEN.

Monday, March 25.—11 a.m. to 2 p.m.

Make microscopic preparations of A and B. In what histological points do they differ? Identify both, and leave a sketch of your preparations with the slides.

What are C, D, and E? Comment briefly on each.

BOTANY.

PROFESSOR GREEN.

Monday, March 25.—3 to 6 p.m.

1. Describe the development of the pollen grains in the flower of a dicotyledonous plant. Mention any abnormalities in the course of such development of which you can give instances.

2. What are plastids? Where do they occur? With what varieties of them are you acquainted? Describe their function in a selected case.

3. What are monostelic and polystelic stems? Describe the structure of a typical stele.

4. Give some account of the movements of water in a dicotyledonous tree. On what do they depend?

5. Describe the appearance and structure of the sexual generation of the common fern.

CHEMISTRY.

PROFESSOR DUNSTAN.

Tuesday, March 26.—2 to 5 p.m.

1. Distinguish between temperature and quantity of heat. State briefly how you would accurately determine temperatures in the neighbourhood of -180° C. and 1000° C.

2. An iron cylinder at 13° contains oxygen at a pressure of six atmospheres, the cylinder being capable of standing a pressure of twenty-one atmospheres. If heated, at what temperature will it burst?

3. Write an account of the processes of oxidation and reduction. Illustrate your answer by reference to the action of the following substances: Nitric acid, hydriodic acid, chromic acid, hydrogen sulphide, hydrogen peroxide.

4. What is meant by "nascent hydrogen"? Mention some chemical changes in which it is supposed to be concerned.

5. State how the following substances may be prepared: Sulphur trioxide, borax, sodium carbonate, phosphorous acid, and fluorine.

6. Describe how the following compounds could be prepared from mercuric cyanide, viz.: cyanogen, prussic acid, and potassium cyanide. How is the last-named salt prepared commercially, and to what impurities is it subject?

EVENING MEETING IN EDINBURGH.

Friday, March 22, 1895.

MR. J. LAIDLAW EWING IN THE CHAIR.

The third evening meeting in Edinburgh of the present session was held in the Society's Hall, 36, York Place, on Friday, March 22, at 8.30.

The minutes of last meeting having been read and approved, apologies for unavoidable absence were intimated from Messrs. P. Boa, D. Brown, C. F. Henry, G. Lunan, T. Maben, J. Nesbit, and W. Swan.

The first paper read was on the "Decomposition of Alcohol-reduced Chloroform," by D. Brown and D. Rainy Brown. This will be found at page 836.

The meeting then proceeded to a discussion on the proposed imperial pharmacopœia, when the following communications were read:—

SOME RECENT CRITICISMS AND SUGGESTIONS.

BY THOMAS MABEN.

Being pressed to contribute my quota to the discussion on the proposed imperial pharmacopœia and not being prepared to say anything worth while, in the way of constructive criticism, that has not been as well said by others already, it occurs to me that I might usefully draw your attention to what some other critics, notably the medical men, are saying on the general subject of the Pharmacopœia. I do this all the more willingly inasmuch as it appears to me there has been in certain quarters an attempt to depreciate the services of the pharmaceutical editor, and this has given no little pain to many pharmacists, more especially as it has been so utterly undeserved. I do not say it has been consciously intended by the majority of the critics, for the medical writers in question have, as a rule, adhered to their brief, but there can be little doubt that these articles, following on the discussion in the General Medical Council, give ground for the belief that a "dead set" is being made on the present system on which the Pharmacopœia is compiled, and this is being done in a way that some of us hardly approve of. By all means let the new imperial pharmacopœia be thoroughly modernised, introduce novelties all round if the Medical Council say it is to be done, make the Pharmacopœia a complete text-book in pharmacy, materia medica, chemistry, therapeutics, and a prescribers' *vade mecum* all rolled into one, if they please, but, at the same time, we have a right to ask the critics to remember that the work which most of them have been engaged in denouncing did not profess to supply any single one of these demands, and for them to blame the editor, inferentially, for its supposed defects in these directions is decidedly unfair.

Within the last two months a series of articles on the Pharmacopœia has been contributed to the *British Medical Journal* by a number of very eminent men. It would be difficult to find an equal number of writers whose opinions possess greater weight in their respective spheres, and therefore anything they say is entitled to the most respectful consideration. Those who have written so far include four lecturers on materia medica, viz., Professor Leech, Manchester; Professor Whitla, Belfast; Professor Cash, Aberdeen; and Dr. Stockman, Edinburgh; Dr. Lauder Brunton,

Professor Dunstan, and Mr. David Howard. In addition to these articles, Dr. Stockman's remarks at the last evening meeting at Edinburgh, a paper on "Nature's Polypharmacy," by Dr. Carter, Professor of *Materia Medica*, Liverpool, and a letter by Dr. Burney Yeo, in the *British Medical Journal*, all contain important expressions of opinion that cannot be ignored.

In common, no doubt, with many who heard or read these remarks, I have carefully perused what has been advanced by the various writers, and the first conclusion I come to is that the lot of an editor who has to arrange such a mass of contradictory matter is by no means one to be envied, and the post of "medical editor or editors" proposed by Dr. Whittle, or Dr. Stockman's "committee of experts," if it is ever created, will certainly be no sinecure. The second reflection is that, after all, there is something to be said for the old B.P. yet. On the whole, it has fairly well withstood the sharpshooters who for ten years have made it their target, and even this last battery of heavy artillery has not been so deadly as one might have expected considering the great array of specialists engaged in directing the onslaught, and thirdly, it occurs to me that had some of the writers wished to be scrupulously fair all round, they might not have made so many points, but on the other hand they would probably have avoided not only contradicting their medical brethren, but contradicting themselves.

It may seem a thankless task to examine these criticisms, still if we can show that the medical specialists have no very clear idea of what they want, and that they are at least far from agreement on points regarded by themselves as important, something will have been gained if only the critics will take the obvious lesson to heart.

The main attack on the galenicals of the B.P. has been led by Dr. Whittle, and he has not been sparing of his criticism. Hardly any class of preparations has been left untouched, and the most sacred among them have been made to feel the crushing weight of his iconoclastic sledge-hammer. Indeed, if Dr. Whittle had his will there would not be much of our present B.P. left, although at the same time any hope of a new pharmacopœia would be relegated to the dim and distant future. Fortunately, the experts do not agree, and there is still some hope that amid their disagreements we pharmacists may be able to conserve a little of the Pharmacopœia, that will be of permanent use to the empire when the current medical fads lie buried in oblivion.

Selecting some specimens without regard to alphabetical order, we find that Dr. Whittle says of the confections that they "may be regarded as belonging to a past time, and as veterans they lag superfluous on the stage." Dr. Burney Yeo on the other hand thinks that "as a means of giving bulky, insoluble drugs, or very pungent or irritating substances in a convenient and at the same time active form, confections are most useful." Of confection of senna Dr. Yeo writes: "Improve its composition by all means, but I do not believe the time has yet arrived when the modern dislike—not a little flavoured with affectation—of polypharmacy will be able to depose our old friend the leni-

tive electuary." With regard to infusions, Dr. Whittle thinks "the entire group should be revised, and most, if not all, omitted, from a medical point of view"; "their strength and actions vary so much that their days are already numbered." Prof. Leech thinks "they are not looked upon with favour anywhere but in this country"; and Dr. Stockman joins the crusade, his opinion being that "preparations containing a large proportion of water, such as infusions, decoctions, and liquid extracts, could be largely reduced in number. It would be quite easy to use the tincture and add water as required." This no doubt would be a convenience if we could be certain that spirit was always the best solvent, but this is a doubtful point. Dr. Carter, for example, refers to what "practical experience seems long to have settled, viz., the superiority of the infusion (of digitalis) over the tincture in the treatment of aortic regurgitation." Dr. Yeo also comes to the rescue by declaring that "infusions should not be wholly discarded, and that fresh infusions of the fresh drug often prove more active than any other preparation." These are little differences of opinion of course which the committee of experts would no doubt soon settle, but the question arises, Would the medical profession give up infusions even if the Pharmacopœia no longer included them? Before the dicta of specialists are accepted, we must be sure that they do no violence to the opinions and practice of the average practitioner. We find for example that a large number of infusions are exceedingly popular with the profession. From Martindale's analysis of 12,000 prescriptions, we find that there are at least a dozen that are regularly prescribed, and three or four of them occupy a high position in popular favour. Dr. Whittle's reason for giving up infusions is a curious one, "their strength and action vary so much."

Does Dr. Whittle mean that he would not object to infusions if they had all the same action? If not, what does he mean? Then it is strange that he should find fault with the varied strengths, since with another class of preparations the trouble is their varied doses. In the case of infusions, uniformity of dose has been secured, and necessarily at the expense of uniformity of strength. Dr. Whittle really ought to be consistent in his criticism, for he must remember that he cannot both eat his cake and have it. In the case of the ointments also he thinks there is "lamentable want of anything approaching uniformity." Here, again, he seems to be inclined to sacrifice everything to an idea. In the U.S. Pharmacopœia a number of the ointments are 10 per cent., but the majority are of all strengths. It would be quite impossible to fix one strength for more than a few of the ointments; otherwise prescribers would be under the perpetual necessity of diluting certain ointments and making others stronger. Dr. Whittle's opinion of the liquors, spirits, syrups, and tinctures, is that "only a very small percentage of these 162 preparations are in use among practitioners, and the reason is obvious, the strengths and doses are so various that it is found impossible to remember either." Dr. Stockman, too, would like doses of tinctures, etc., made uniform, but he uses the term "valoids" in such a way as to suggest that he is not quite

sure of his ground. Valoids have no relation whatever to dose; they are preparations—liquid extracts, in fact, in which one ounce represents an equal weight of the drug. If, therefore, this principle of valoids were adopted the doses would be still more varied. It is not clear whether Dr. Whitla would like to assimilate the strengths or the doses, but it is evident that in any case either the one or the other must always be "various," and therefore his criticism loses half its force the moment it is examined. As to the statement that "only a very small percentage" of these preparations are in use, it is a sufficient refutation to quote some figures from Martindale's analysis. Out of 150 preparations, viz., liquors, syrups, spirits, and tinctures, one was prescribed upwards of 1000 times; 28 were prescribed from 100 to 1000 times; 58 from 10 to 100 times; and 46 under 10 times; only 18, of which 12 were liquors, not having been prescribed at all. If this is an average set of figures, and there is no reason why it should not be, it will be seen that if we reckon on fifty million prescriptions in the course of the year, the probability is that the correct thing would be to say that "only a very small percentage" are not in use. Hardly anything is as red from Dr. Whitla's onslaught. The wines "should probably be excluded"; decoctions, plasters, and extracts contain "numerous examples of inert preparations"; vinegar "encumbers valuable space"; the lozenges are "a very doubtful addition"; mustard paper is not a success; and the poultices are "a serious blemish." *Catsplasma conii* is a veritable tit-bit to the critics, for no fewer than three of them make it the subject of lengthened comment. Dr. Whitla thinks that the enemata "afford the best examples of official preparations framed in opposition to the recognised principles of physiology and therapeutics," but to laymen it sounds strange to hear that the recognised principles of physiology and therapeutics should have altered so much in ten years. Of course there is the alternative proposition, that Dr. Quain and his colleagues were ignorant of these principles, and so permitted a glaring error to pass, and probably this is the true explanation, as even to-day there are men who think highly of these preparations. Dr. Lauder Brunton, for example, says that enema *asafoetida* is "one of the most useful remedies in the whole Pharmacopoeia," though he would make it with the tincture, while Dr. Yeo joins issue with Dr. Whitla, and is of opinion that "the Pharmacopoeia should contain a few typical examples of this very useful mode of administering medicine," and he also proposes to add a "typical nutrient enema." It is sad to think that these eminent men are so ignorant of the "recognised principles of physiology and therapeutics," and since the leaders are so hopelessly befogged, we need not wonder at what they tell us of the ignorance of the rank and file. There is only one thing more surprising than that ignorance, and it is that these learned men should take such pains to make it known. There are medical men who write prescriptions such as this—

R. Liq. Strychnine ʒij
 Liq. Potassæ ad..... ʒj
 Sig.—20 drops for a dose.

But though we all know one such among our acquaintance, we all think he is the exception. It seems not, for Dr. Lauder Brunton wishes the most elementary facts in chemistry stated, and apparently would like every possible reaction indicated in every possible combination of chemicals. Not content with that, he proposes that the Medical Council should "have experiments made to settle such questions" as "whether the strychnine out of ten drops of tincture of *nux vomica* will be precipitated by the tannin in an ounce of infusion of gentian!" Not only does he wish a table of solubilities in cold water and in hot, but he is curious to know whether certain substances that have been dissolved by heat are entirely deposited on cooling. He wishes directions for prescribing drugs, so as not to produce a heavy precipitate, a disagreeable colour, or an abominable taste; for now that the doctor knows so little practical pharmacy he is liable to make these little blunders, and where he does not dispense his own prescriptions he has "no chance of rectifying his mistake" when the medicine is made up. Dr. Yeo is also strong on the ignorance of the young medical man in this direction who "knows so little of practical pharmacy or of the art of formulating" that the hypodermic syringe is for ever in request, "and its indiscriminate use is responsible for more serious consequences than I like to contemplate." He believes that many deaths have been caused by the incautious use of the morphine injection, which is far too strong; so strong, Dr. Whitla also thinks, as to be "positively dangerous." In this connection I may refer to Mr. Naylor's proposal to make the potent remedies have a strength of "10 grains in 100 minima." Apart from the difficulty of making some of the solutions of this strength, I think that 10 per cent. is needlessly high; besides, for purposes of calculation, 1 per cent. is almost equally simple, and that strength has much to recommend it. What strikes me as very curious is that Mr. Naylor should propose the adoption of the metric system of weights and measures, and at the same time violate its main principle by making his liquors 1 in 9!

Generally speaking, this discussion of the Pharmacopoeia has begun and ended in criticism. There have been few suggestions of any value by way of addition or improvement, but regarding those that have been made there is no more agreement than there is with reference to the criticisms I have quoted. For example, Dr. Lauder Brunton wishes cachets and tabloids made official, and Dr. Whitla hints that "the recent perfection of the manufacture of tabloids" would suggest that they be substituted for lozenges. On the other hand, Dr. Yeo speaks of the "uncertainty of the compressed tabloid, with which we are at present a little overwhelmed," and Dr. Stockman objects *in toto* to include tablets; as well he thinks introduce capsules, these latter, however, being exactly what Dr. Lauder Brunton wishes to introduce, as they are "useful aids" in administering disagreeable medicines. Dr. Yeo's opinion is that capsules in certain cases "cause such an amount of gastric irritation as to contra-indicate their use, but these drugs," given in the form of confection, "are admirably tolerated." The committee of experts will here have to decide

whether capsules are to be introduced or not, and if they are, what medicines are to be administered by capsules and what by confections. It will be well to be precise on these points, as it is apparent that the degeneration of medical men in practical pharmacy will increase rather than otherwise, and if the Pharmacopoeia is to be made up of milk for these babes, certainly the information ought to be as complete as possible. Further, if all the "useful aids" for administering disagreeable medicines are to be included, it would hardly be fair not to recognise much more universal aids even than capsules, namely the raspberry jam and the red currant jelly of our tender years!

The question of therapeutics has also been raised. Apparently none of the foreign pharmacopoeias referred to by Dr. Leesh take up therapeutics. But our new imperial pharmacopoeia need not be hampered by precedents. Dr. Lauder Brunton thinks "some indication of the action of medicines" would be an innovation warmly welcomed. Certainly it would be an innovation, and it might be welcomed, though I do not see why it should be, since medical men are specially trained, or ought to be, in therapeutics, and have text-books dealing entirely with that branch of their profession, but I question if it would be so favourably received ten years hence. We can, if we like, stereotype the formula of a tincture, but it would be perfectly hopeless to attempt to stereotype the diseases for which that tincture will be prescribed within the next month, not to speak of ten years. Dr. Whittle is even more emphatic. "The time has now come when the work (of framing the Pharmacopoeia) must be undertaken in a totally different spirit, and the revisers must go to the root of the matter and produce a volume which will be an index of the advanced pharmacy and therapeutics of the day," and he adds, only too truly, "it will take at least a few years before this result can be accomplished." It appears, therefore, that any hope of soon seeing an imperial pharmacopoeia must be given up if these authorities have their way.

It has been for some time considered fashionable to sneer at what is called polypharmacy, and some of the authorities are anxious that preparations of crude drugs should be displaced by solutions of their active principles. Professor Cash makes a remark which has a general application. "It is," he says, "neither conducive to the accuracy of pharmacological research nor yet of treatment, that we should work with bodies whose constitution is not understood, or which may contain principles divergent or even antagonistic in their action." Admitting this to be correct, what are we to say of digitalis, which contains antagonistic active principles, and of which Dr. Stockman says, "nobody has ever worked up the subject with such exactitude that one can feel justified in departing from the use of the leaves"; of ergot, of which "our chemical knowledge is still more deficient"; of hyocyamus, of jaborandi, and numerous other drugs that might be named? Regarding some of these, Dr. Stockman thinks that the new edition will be indefinitely postponed if such points are to be worked up

and determined, but, nevertheless, his committee of experts no doubt "could easily in a few meetings decide" where we are to draw the line in applying the principle of abolishing polypharmacy. There are many drugs of which we need not be in doubt, but what of those that lie on the border line? Dr. Stockman would discard tincture and extract of nuxvomica for strychnine—oblivious of the fact that the tincture is prescribed in the proportion of 3 to 1 of the liquor—substitute atropine for belladonna, elaterin for elaterium, tannic acid for powdered galls, and so on. Dr. Lauder Brunton is also on the same side; he thinks that the B.P. pills are too large, and that they should be replaced by granules the size of a pin's head; but even these are not perfect, as patients have been known to mistake arsenic granules for homoeopathic pills, and swallow them accordingly, very much to their discomfort.

Dr. Stockman agrees that pills are too large, and would have them reduced by omitting all but the active ingredients. His committee of experts would therefore have to determine the active ingredients in rhubarb pills, colocynth pills, aloes and iron pills, and so on; retain these and leave out all that is not active. If this means that by so doing he would secure pills of the same strength, but half the size, his committee would find its work out for it. It is assumed in all this that the experts would agree among themselves, but are we certain that they would? Professor Carter is an expert, and what does he say?—"An increasing knowledge of the constitution of many of our old-established and best approved remedies proves that on safe ground some degree of polypharmacy is justifiable," and as illustrations of this fact he gives jaborandi, digitalis, opium, and calabar bean as natural examples, and Warburg's tincture and Graves' prescription for dropsy as valuable medical examples of polypharmacy. If therefore the committee of experts be a representative one the task might not be so simple as some would expect, and, the chances are that the "few meetings" would be gradually drawn out to the "few years" required by Dr. Whittle for carrying out his programme.

I close this already too long paper by referring to a remark made by Dr. Stockman, who thought the pay should go to the men who did the work. Admitted—but I rather think difference would still arise as to the distribution of the pay. He would, for example, very likely think that the addendum committee should have been considered, but in that case someone else might wish to institute an inquiry in order to see how the matter would stand on the principle of "payment by results." If that were done, it would probably be found, as Dr. Stockman states, that one-third of the addendum galenicals are never prescribed and could be dropped out; that three-fourths of the remainder were "lifted" almost without a word of alteration, and certainly without a word of acknowledgment from the B.P.O. formulary and the Extra Pharmacopoeia; and finally, that the effective result of the committee's labours consists of an abortive substitute for eponym that not one doctor or pharmacist in twenty will look at, with a couple of ointments, one of

which at least cannot be called a success. Would Dr. Stockman be satisfied with a "show" like this for his money? Seriously, I do not think it is fair to hint that the editor gets paid for other people's work. So long as Professor Atfield occupies the position of editor of the *Pharmacopœia* and bears the responsibility for that important national publication, so long ought he to be paid accordingly, and no one who knows anything of his work in the past will doubt that he is the very man for the place. The work of editing a pharmacopœia does not consist in evolving arm-chair formulæ—neither does it consist in doing porter's work in a wholesale laboratory. From the nature of the case the *Pharmacopœia* in this country will always be the product of the work of many men, each working not for pay, but for love of the work, and with not even the ulterior aim of his work ever being officially recognised. No matter what committees are appointed, there will be always others outside the committees whose work has to be taken account of. It is one of the functions of the editor to separate the wheat from the chaff, and preserve what is worth preservation, whoever the worker may be; that Professor Atfield has done this part of his work with conspicuous success no one can deny.

PHARMACOPŒIA PROCESSES.

BY J. B. STEPHENSON.

My contribution this evening consists of a few notes which I have been led to make on some of the processes in the *Pharmacopœia*, in the course of putting them in operation.

Acids.—I have always regarded the directions for diluting the hydrochloric, nitric, and sulphuric acids as unfortunate. We are told to dilute them with so much water, and then to add as much more water as will bring them to the desired measure at 60°. I can imagine a loyal man following this direction implicitly once, but I am sure he would note the quantity of water required to bring up the measure, and the next time he made the preparation would add it to the acid at once along with the rest, and this is what I think the compiler should have done if it was necessary that the strength of these diluted acids should be adjusted with as much accuracy as if they were volumetric solutions, but is this really necessary? They are used, I suppose, exclusively for medicinal use, and I should imagine a slight variation in strength quite immaterial.

As the formulæ stand they are very apt to lead to confusion and mistakes in calculating different quantities than those ordered. These quantities also differ strangely among themselves. In the case of hydrochloric acid it is 26½ fl. oz.; nitric, 31 fl. oz.; and sulphuric, 83½ fl. oz. After what I have said I need not add that I think the alternative process of making these preparations by weighing the acids and diluting to the required measure quite unnecessary.

Acid Nitro-Hydrochlor. Dil.—In the 1867 *Pharmacopœia* this was made by mixing the strong acids, letting stand for twenty-four hours, and then diluting with the water. There had been a complaint that some

of the chlorine was lost in following this process, and the present plan was adopted in the 1885 edition of diluting the acids at once and keeping for fourteen days before use. There is certainly no loss of chlorine here, and for the best of all reasons, that there is none to lose, for it is not formed—at least, in any appreciable quantity.

Emp. Belladonna is, I think, too strong—1 to 4—and it is too soft for a plaster. Made of the strength of 1 to 7—surely strong enough—and with plain resin plaster, it is a perfect plaster.

Ext. Cascara Liq.—The bruised bark is exhausted readily and completely by percolation with cold water, allowing it to stand well moistened with a sufficiency of the water for twenty-four hours previously.

Glycerinum Acid. Tannic., is quite readily prepared in the cold. When heat is applied it is apt to become discoloured by keeping. There is an old suggestion, and I think it worthy of adoption, to dilute the glycerin with water. From an eighth to a twelfth of the latter added to it makes the preparation more convenient to use, especially in cold weather. I have heard the objection stated to this that it is desirable to have a very thick application so as to adhere to the part better. I can only say that I have not heard of this objection being valid in practice.

Glycerinum Boracis.—The addition of water is ordered, but there is too much—1 part to 2 of glycerin makes it unnecessarily thin. I would suggest that the addition of water, say one-tenth or one-twelfth, should be ordered in all the glycerins, which are thick viscid solutions.

Glycerinum Tragacanthæ is too stiff. One-half or two-thirds of the quantity of tragacanth makes a much more suitable pill excipient.

Linimentum Torbenthinæ.—The difficulty with this preparation is simply a question of the quantity of water. The soap, of necessity, varies in the amount of water it contains, and the water used should vary accordingly. The formula should order as much water as will form a thick cream with the soap.

Liq. Calcis Sacch.—It would be an improvement to order the sugar to be dissolved in the water and then the lime to be added.

Suppositories.—In such as tannin, iodoform, and morphine, the quantity of the medicinal ingredient is deducted from the ol. theobrom. ordered. This is misleading, because the mass so made will not yield twelve 15 gr. suppositories. Of course they will weigh 15 grs., but they will not fill a 15-gr. mould.

Syrups.—The strength is adjusted so as to give a saturated solution of sugar, but under the ordinary conditions of the shop they all crystallise. One-twentieth more of water would obviate this.

Tinctures.—The process by which most of these are to be prepared has been much criticised and condemned. The ingredients are to be macerated for forty-eight hours in three-fourths of the spirit, then percolated, and the remaining fourth to be passed through the marc. In many cases—perhaps in all—the forty-eight hours might be changed to twenty-four, and a somewhat larger proportion of the spirit

might be reserved for washing the marc, but I think that on the whole, and as a general process, it will be found to yield a more uniform and satisfactory result than any other. It is quite applicable to tinct. aurantii, which is ordered to be made by maceration only. The maceration in tr. myrrhae is quite unnecessary. The myrrh should be placed loosely in the percolator and the spirit poured on it at once. It passes through readily and exhausts it perfectly. The general process should not be ordered where there is a very small quantity of material to be operated on, as in the case of tr. capseli, nor is it suitable, nor indeed possible, where the quantity is large or bulky as in tr. lupuli. Nor do I think it is suitable for tr. scillae or tr. calumbae, which should be made by maceration. The tr. iodi will surely be increased in strength to that of the old Edin. tincture (3ss. to ʒi.), after all that has been said about it, and the application of heat will also be omitted in tr. quin. and tr. quin. am. It is quite a blot to have it mentioned. I would be very chary in adopting any spirit weaker than proof for tinctures. Before doing so, I think it would have to be proved conclusively not only that the tincture so prepared is stronger and better, but also that it is equal in keeping properties to that made from proof. The value of a tincture as a pharmaceutical preparation consists greatly I think in this latter.

Ung. Acid. Boric. may be made more readily than by sifting the boric acid into the melted paraffin, by rubbing the acid in a warm mortar, adding the melted paraffin, and stirring diligently till cold.

GENERAL NOTES.

BY GEORGE COULL, B.S.C.

It may or may not be matter for congratulation during the present "spate" of addresses, lectures, and letters on the new edition of the Pharmacopoeia that the discussion of the subject was initiated in Scotland. What struck one most forcibly who listened to the discussion following Professor Charteris' lecture was the clear and sharp division of opinion on the question of expunging many articles from the Pharmacopoeia. The one portion of the camp was composed of the medical contingent and our younger brethren, and the other consisted of the fathers of the craft. The former agree with the professor in his policy of deletion and the latter say—abolish not the landmarks.

Now all this discussion may be not without its due value, but there is one thing that we as pharmacists ought not to lose sight of, and that is, that it is really not our province to say what is and what is not to be included in the Pharmacopoeia. It is the prerogative of the medical profession to do this thing through its representatives—the General Medical Council. After they have stated what drugs and likely preparations of these drugs are to be made official, our part is then to step in and aid them in their helplessness by showing how these drugs may be best exhibited, and fixing standards and tests for those whose purity can be determined by chemical examination.

If we are asked about the relative frequency with which certain drugs and preparations are sold, let us

give all the information we can, but let us not insist, *bon gré, mal gré*, on the insertion or deletion of particular articles. These are matters of opinion, and where our opinion conflicts with that of the medical profession the chances are that ours will be ignored. On the other hand, improvements in processes and tests that are the result of direct experiment are always of value.

It is satisfactory to note that the General Medical Council has requested the co-operation of pharmacists in the revision of the Pharmacopoeia, but this is *ex gratiâ*; my opinion is that we should consider it as our right to have a hand in helping to frame the national Pharmacopoeia, and not look upon it as an honour for which we ought to feel devoutly thankful.

Dr. Lauder Brunton, in his now historic article in the *British Medical Journal*, says the Pharmacopoeia is primarily intended for the medical man. As I read the preface to the B.P., 1867, I see nothing to that effect. "It is intended to afford to the members of the Medical Profession and those engaged in the preparation of medicines throughout the British Empire one uniform standard and guide. . . ." A careful reader will observe that the punctuation here is slightly different from Dr. Brunton's; he introduces commas after "Profession" and "Empire," as if the words between the commas were parenthetical or of secondary importance. In the original there are none, and the medical profession and pharmacists are to be taken as equally concerned with the said standard and guide. The reason the medical profession is placed first is, of course, simply a question of precedence.

The one thing in Dr. Brunton's paper about which I think we are all agreed is the desirableness of a table of solubilities, or at any rate a thorough revision of the solubilities already given. If by any mischance this new imperial pharmacopoeia is converted into a prescriber's and dispenser's pocket companion, giving notes on incompatibles, therapeutics, and how to make presentable copaiba emulsions, it will be subject for mirth among the civilised nations of the earth. While on the subject of Dr. Brunton's paper I may be allowed to point out a bad slip he made in referring to tincture of chloroform and morphine as compound tincture of chloroform. The entire article may be alliteratively summed up in two words—distinctly disappointing.

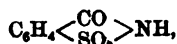
A few of the following remarks I have made on previous occasions (sometimes reiteration is necessary before a statement is accepted as fact), and some may be unnecessary, owing to the deletion of the article from the Pharmacopoeia.

What is specially wanted in the Pharmacopoeia from the pharmacist's point of view is much more explicitness in the application of tests and in the preparation of galenicals. Several examples will be given below, and there are, I have no doubt, many more. The name of the body which the application of a test is supposed to indicate ought to be inserted. Why this should be surely needs no argument.

Doses ought still to be included after being revised,

as a guide to the pharmacist. If he has to get his doses from a book on therapeutics, he will naturally acquire some theoretical knowledge of the actions of drugs, and, being only human, the temptation to sometimes prescribe will not be resisted.

Chemical formulæ should be given more in accordance with modern chemistry, as showing the constitution of the substance. This principle has been partially adopted in the additions, 1890, and rather unequally. Acetanilide and sulphonal are given correctly, glusidum should be—



benzoic sulphimide or *o*-sulpho-benzoic-imide, and it might with advantage be added that it is the inner anhydride of *o*-sulphamine benzoic acid. It is not attempted to give a constitutional formula for phenacetin, $\text{C}_8\text{H}_9(\text{OC}_2\text{H}_5)(\text{NH.C}_2\text{H}_5\text{O})$ aceto-*p*-phenetidin, and sodium benzoate is stated to be $\text{NaC}_6\text{H}_5\text{O}_2$, which is quite correct, but it would be better to give $\text{C}_6\text{H}_5\text{.COONa}$ as the formula. Acetic, benzoic, and carbolic acids, acetic ether, butyl chloral hydrate, chloral hydrate, and indeed all organic compounds whose constitution is known, should have their constitutional formulæ appended.

Acids (Dilute).—If these were all made by weight, much time would be saved in waiting till the diluted acid attained the temperature of 60° F. (15°·5 C.) before being made up to the volume ordered. The test for sulphurous acid in several acids by means of the reducing action of hydrogen—with formation of sulphuretted hydrogen, and subsequent blackening of lead acetate paper held in the mouth of the flask—could be much simplified by ordering that solution of iodine should not be decolourised by the acid, with the addition of starch if further refinement is desired.

Acidum Carbolicum.—I observe Mr. Lunan has been advocating the introduction of the bromine assay process. The only use for this is to approximately determine the amount of carbolic acid present in a mixture of carbolic acid and water. The substance most likely to be present in carbolic acid is cresylic acid in one or more of its modifications, and it, in common with all phenols, forms substitution products with bromine in a quite analogous manner. It might be of some little use if introduced under acidum carbolicum liquefactum, but I do not think it can be of much value under acidum carbolicum. If the melting point and boiling point are altered in accordance with my suggestion, we shall have a very good article. Bromine water is said to give a white precipitate with a cold saturated aqueous solution; as a matter of fact, even very dilute solutions give a precipitate.

Acidum Hydrobromicum Dilutum.—A test for sulphurous acid ought to be given, sulphurous acid or a sulphite being sometimes added to decolourise the acid when it has turned brown. I find that a very pure acid is the result of the action of bromine on phosphorus. This is probably one of those articles the method of preparing which will be omitted in the new pharmacopœia. There appears already a

sufficiently unanimous consensus of opinion both on the medical and pharmaceutical sides regarding the desirableness of this. The specific gravity of a 10 per cent. acid is stated to be 1·077. Squibb casts a doubt on this, and I found when preparing some in the manner indicated above that the specific gravity 1·0715 corresponds to about 10·1 per cent., and 1·0749 to about 10·35 per cent. of real acid. This will require to be corrected.

Acidum Hydrocyanicum Dilutum.—The B.P. method of determining prussic acid is decidedly troublesome, and the U.S.P. process is a distinct improvement. It consists in adding the acid to an excess of magnesia in water and titrating with silver nitrate, using potassium chromate as indicator. Squire says manufacturers purposely add a trace of hydrochloric acid to prussic acid to retard decomposition, and that the U.S.P. process reckons as cyanide any chloride that may be present. This is very true, but the B.P. gives a test for hydrochloric acid, the U.S.P. does not; it intends the process to be used to standardise the recently prepared acid, in which there ought to be no hydrochloric acid present. If an acid is necessary, or desirable for preservation, might I suggest the employment of sulphuric acid and the inclusion of a standard?

Acidum Meconicum.—The formula should be stated so as to show the basicity of the acid.

Acidum Oleicum.—Mr. Dott objects to the term "fatty acid" being applied to this acid, and I agree with him. Perhaps the term "unsaturated fatty acid" would be sufficiently accurate.

Acidum Phosphoricum.—A much simpler and more easily performed determination of this acid would be by means of caustic soda and phenol-phthalein, remembering that the change of colour occurs when two-thirds of the acid is neutralised. This, I submit, is even better than the uranium process suggested by Mr. Lyon.

Acidum Tartaricum.—This is a case where we ought to have more definite tests. An aqueous solution of the acid is not affected by sulphuretted hydrogen. This, apparently, excludes all soluble salts of lead, but does not exclude metallic lead. There ought to be a standard laid down and a certain way of performing the test, in order to obviate all ambiguity and save us from the "bossism" of the omnipotent public analyst.

Aqua.—The instructions for preparing most of these are to take a certain quantity of the bruised drug and two gallons of water, and distil one gallon. If one simply followed out these directions, and sent out the water as it came over, he would soon hear of it. Customers simply will not have waters that are not perfectly bright. An excess of oil comes over and floats on the top of the water, which has quite a milky appearance. The water has to be separated from the oil and filtered at as low a temperature as possible, in order that it may not again become milky when the temperature falls. I am not sure but that the suggestion which has been already made to follow on the lines of the U.S.P. would be a vast improvement on our method.

Cinchona.—In the assay of this drug the temperature at which the quinine is to be dried should be stated, and its composition indicated—anhydrous, monohydrate, or trihydrate.

Choral Hydras.—Formula should be given as $\text{CCl}_3\cdot\text{CH}(\text{OH})_2$, showing that the water is chemically combined and not merely water of crystallisation.

Decoctum Pareira.—In the preparation of this galenical pareira root is ordered, and in the case of the liquid extract the solid extract is used, the idea being that you get a more uniform liquid extract owing to the variation in the quality of the root. I think it is rather inconsistent to use the root in the one case and the solid extract in the other. In fact, it may be said without trenching on the medical man's ground that this is one of the redundant preparations of the Pharmacopœia.

Ergotinum.—The instructions here involve a foolish waste of valuable material. I wonder how many makers adopt this process.

Extractum Cimicifugæ Liquidum.—Why is rectified spirit ordered here, and proof spirit in making the tincture?

Extracta Liquida.—I am strongly in favour of re-percolation being employed in the preparation of liquid extracts, and I would further make them all one in two. There would then be no necessity for evaporating the last portion of the percolate as in the case of coca, which might as well be omitted for all the cocaine you get to survive this treatment. I do not think there are many, if any, drugs whose soluble matters are not entirely extracted by being treated by re-percolation to make a one in two preparation. Another advantage would be that some tinctures might be expunged as redundant.

Ferri Carbonas Saccharata.—Dr. Whitla in his recent article says commercial specimens prepared by the official process generally yield about 20 per cent. of real ferrous carbonate. I have previously pointed out that it is quite easy to prepare this by the B.P. process to contain the proper proportion of ferrous carbonate. It may be further added that if kept dry there is no danger of oxidation; it is not so much the exposure to air as the presence of moisture that does the mischief.

Ferri Phosphas.—The standard for this is none too high: in fact, it could easily be raised, but the directions for making would require to be amended. The present process does not give such a high percentage of ferrous phosphate as may be got from the same quantities differently manipulated. Recent batches have given me 67.3, 70, 56.3, 51.2, and 69.3 per cent. The amount of oxidation depends on the manner of mixing the solutions, the temperature of the solutions, the manner of washing the precipitate, and the temperature at which it is dried. There is no more certain way to oxidise a ferrous precipitate than by washing it on a calico filter, a fresh portion of the precipitate being exposed to the air after each addition of water. I intend to examine the different methods of making ferri phosphas and report.

Glycerinum.—A test for arsenic should be inserted, leitmann's or Gutzeit's.

Injectio Apomorphinæ Hydrochloratis.—It is impossible to get all the apomorphine hydrochloride into solution.

Linimentum Saponis.—Soft soap makes a perfect solution very quickly.

Linimentum Terebinthinæ.—Doubling the water, as several have recommended, works well with some samples of soap, but with others it is of no avail.

Liquor Ferri Dialysatus.—This, literally translated, is dialysed solution of iron, but the Pharmacopœia freely renders it solution of dialysed iron. Some objection is apparently taken to the term dialysed iron. Considering that the dialysate is what is wanted and not the diffusate, I do not know of any more appropriate name to call it, only I would make the English and Latin names correspond. 'Potassium ferrocyanide is said not to cause any precipitate, but it has done so in every batch of dialysed iron I have made.

Liquor Magnesi Carbonatis.—I once suggested the use of sulphuric acid and methyl-orange as the most satisfactory method of determination. Since then I have used cochineal as indicator, and find it gives a much sharper end reaction than methyl-orange. I therefore suggest that this method be adopted.

Liquor Plumbi Subacetatis.—A useful addition to the instructions here would be to order distilled water recently boiled and cooled to be used in diluting to the proper strength. Before it occurred to me to boil the water I used to be greatly annoyed by the cloudiness which often appeared on dilution, through the absorption of carbonic acid by the distilled water.

Liquor Potassæ.—Under this solution as well as some others a definite specific gravity and a definite percentage strength are given. It is only when dealing with chemically pure materials that we can get a definite specific gravity to correspond to a definite percentage strength. I am of opinion that this is a suitable place for the insertion of that much maligned little word "about." Either make the specific gravity or the percentage the fixed quantity and the other the variable, or insert "about" before both of them.

Liquor Zinci Chloridi.—When evaporated to the required bulk and cooled, this solution becomes opalescent and gradually deposits what is probably zinc oxychloride. It requires the addition of hydrochloric acid to keep it clear. I have found the specific gravity to be 1.569 and 1.536; the B.P. gives 1.460.

Mistura Ferri Aromatica.—Some say that this should be filtered after the addition of the tinctures. I do not think it should, but it might be mentioned whether it ought to be or not.

Olea.—The great advance of late in the chemistry of essential oils necessitates the inclusion of chemical tests and physical constants brought up to date.

Opium.—The next pharmacopœia must state whether the strength of preparations of morphine is to be calculated on morphine hydrate or on anhydrous morphine. At our last evening meeting Mr. Dott said that tincture of opium should be standardised to contain 0.75 gramme morphine hydrate in 100 C.c. The strength of the tincture at present is calculated

on morphine dried at 90° 100° C. In the case of a substance like morphine there should be no ambiguity.

Potassii Tartras Acida.—There is now no difficulty in obtaining this to contain 99 percent. acid tartrate. The volumetric determination with caustic soda and phenol-phthalein ought to be introduced in place of the cumbersome method of ignition, and a test given for sulphates, potassium bisulphate being a possible adulterant which would use up more soda weight for weight than the acid tartrate would.

Spiritus Ammoniac Aromaticus.—After adding the quantity of barium chloride ordered in the test for carbonate and filtering, the addition of more barium chloride sometimes does not give a further precipitate, but on heating the precipitate is at once formed. Here again there should be more exact definition. I have never seen the text-book fact taken into consideration that precipitates of barium carbonate are slightly soluble in ammonium chloride. I have used for some time cochineal as an indicator in the titration for total alkalinity, and find it all that could be wished.

Spiritus Armoraciae Compositus.—As in the case of the waters the oil comes over and floats on the distillate. We are not told to separate it and filter.

Volumetric Analysis.—There can be no doubt in the mind of most people that full advantage is not taken in the Pharmacopœia of the, generally speaking, beautiful simplicity, mathematical exactitude, and *fin de siècle* expedition of the methods of volumetric analysis. A detailed statement of what is absolutely necessary would take too long to enter fully into now, suffice it to say that the principles of this branch of analysis could be enormously extended in the Pharmacopœia.

(To be continued.)

Proceedings of Societies in London.

CHEMICAL SOCIETY.

At a meeting held on Thursday, March 21, a series of communications from the University of Prague, Bohemia, by Professor Brauner and his pupils, were read by Professor Brauner:—

DETERMINATION OF SUGARS.

The determination of sugars by Pavy's method is attended with no inconsiderable difficulty, and it has been shown that only under certain conditions can concordant results be obtained. These difficulties are due to oxidation by the air, and the usual method of overcoming this difficulty, by working in a current of inert gas, as nitrogen or hydrogen, is not available, since ammonia is carried away by the current of gas. The authors recommend the titration to be performed in a beaker containing the Pavy-Fehling solution (Fehling's solution and ammonia), which is covered with a layer of heavy paraffin oil. The orifice of the burette dips under the oil, the sugar solution is added, and the titration conducted in the usual manner.

Working in this way accurate results were obtained

ACTION OF HYDROGEN SULPHIDE ON ANTIMONIC, ARSENIC, AND TELLURIC ACIDS.

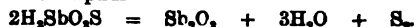
These investigations were undertaken to find out what products were formed during the above interactions, and if any evidence of the existence of a tetrasulphide of antimony, Sb_4S_4 , could be obtained.

The authors were not able to adduce final evidence of the existence of this compound, but show that there is a probability of its existence from analogy with the double salt $3KCl \cdot 2SbCl_4$, which is a stable and definite salt.

When excess of hydrogen sulphide is passed through the solution of antimonious acid, it is possible, by having a quick current and working at a low temperature, to obtain an immediate precipitate which consists of antimony pentasulphide, Sb_2S_5 .

If, however, the current is slow and the temperature raised, a precipitate slowly forms which consists of sulphur and antimony trisulphide Sb_2S_3 .

By working under certain conditions, the authors have been able to obtain evidence of the existence of an antimony sulphyro-acid. When hydrogen sulphide is passed through antimonious chloride a precipitate is obtained, under certain conditions, of sulphur and antimony tri-oxide. In addition to the acids known as sulphantimonious acid, H_2SbS_4 , and antimonious acid, H_2SbO_4 , there probably exists an intermediate compound of the formula H_2SbO_3S , which, however, is an unstable acid, the salts of which cannot be prepared, and on evaporation to dryness yields antimony tri-oxide and sulphur—



The corresponding salts of the sulpharsenic acid are, however, known.

THE ATOMIC WEIGHT OF TELLURIUM.

Very careful re-determinations of the atomic weight of this element by means of analyses of the tetrabromide and telluric acid lead to the value as 127.71. This atomic weight, however, does not at all agree with the position of the element as shown in a portion of Mendeleeff's table below.

N(14)	O.(16)	F(19)	A.(20)
P(31)	S(32).	Cl(35.5)	?
As(75)	Se(79)	Br(80)	?
Sb(120)	? Te(125)	I.(127)	? Te.(130).

It will be seen on reference to this table that if tellurium has the atomic weight 127.71, it must fall on the other side of the halogen to that occupied by sulphur and selenium.

Since tellurium has undoubted analogies with these latter elements, the author is of the opinion that the tellurium examined by him is a mixture of elements—perhaps two, with atomic weights 125 and 130.

The telluric acid used was very carefully purified from sodium tellurate, which was fractionally precipitated in a similar method to that used in the separation of the rare earths.

Each fraction, however, gave the same results on analysis, and the only evidence that it was not an element was the fact that tellurium dried in an inert gas gave different results to those when sublimed in a current of hydrogen.

If, then, there are two elements, the true tellurium would have an atomic weight of about 125 and fall in the sulphur group, and the other element would be one of atomic weight 130, and would fall in the eighth column or argon group.

The following papers were also read.

NOTE ON THE HYDROLYSIS OF MALTOSE BY YEAST.
BY DR. MORRIS.

Fischer (*Ber.* xxvii., 1895), has recently shown that yeast extract (made by digesting 1 part of air-dried beer-yeast (Frohberg type) with 15 parts of water for 15 hours at 30°–35°) readily and completely effects the conversion of maltose into glucose. This re-action being remarkable, since ordinary yeast has not been known to produce glucose during fermentation, the author repeated and extended the experiments. With ordinary yeast and pure culture of Frohberg yeast, no glucose could be detected during or after fermentation, but when the air-dried yeast was used, glucose was readily formed and identified. This might be due to either the presence of micro-organisms taken from the air during the drying of the yeast, or to the feeding of the yeast cells on each other when dried. Experiments, however, showed that to neither of these causes could the difference in the action of yeast and air-dried yeast be ascribed.

The author is engaged in investigating the cause of this remarkable difference.

STUDIES IN ISOMERIC CHANGE. PART III. THE
ETHYL-BENZENE-SULPHONIC ACIDS.

BY DR. G. T. MOODY.

The author* has previously shown that toluene yields on sulphonation a mixture of ortho-, and para-, sulphonic acids, but that other benzene hydrocarbons, xylene, etc., yield only the para acid on sulphonation.

The experiments were now extended to the sulphonation of ethyl-benzene, $C_6H_5 \cdot C_2H_5$, which was found to yield only the para-sulphonic acid, 1:4, $C_6H_4(C_2H_5)(SO_2H)$. This is contrary to most of the statements previously made, but these results were probably due to the use of impure ethyl-benzene. The material used in these experiments was very carefully prepared, and great pains were taken to ensure the purity of the hydro-carbon before sulphonation. The author prepared the ortho-sulphonic acid from para-brom-benzene, and found it to be a most unstable acid, yielding the para-ethyl-benzene-sulphonic acid on the slightest elevation of temperature, evaporation on a water bath being sufficient to bring about this change. No trace of ortho-acid could be found in the sulphonation of ethyl-benzene even if conducted at low temperatures, the sole product being para-ethyl-benzene sulphonic acid, 1:4, $C_6H_4 \cdot C_2H_5 \cdot SO_2H$.

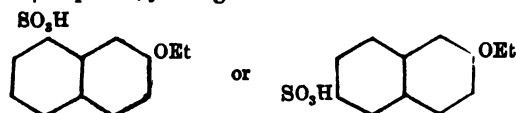
SULPHONATION OF ETHOXY-NAPHTHALENE.

BY MR. LAPWORTH.

Experiments were conducted in order to see if the presence of the ethoxyl group in place of hydroxyl or hydrogen in naphthalene made any difference in the

position taken up by the sulphonic radical during sulphonation.

It was found that on sulphonation of β -ethoxy-naphthalene the sulphonic radicals took up exactly the same position as in the sulphonation of naphthalene or β -naphthol, yielding a mixture of 1' or 3' acids.



By modifying the process, however, and using ethyl-sulphochloride to produce sulphonation, an intermediate product was obtained, which was 1-2 ethoxy-naphthalene sulphonic acid. This acid, however, was unstable, and easily decomposed at the ordinary temperature to a mixture of the acids 1' or 3' given above.

The replacing of a hydrogen by either the hydroxyl or ethoxyl makes no difference in the position taken by the sulphonic radicals on sulphonation, in all cases a mixture of 1' and 3' acids being obtained.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

A general meeting of the above Society was held on Wednesday evening last, at the Rooms, New Surrey Street. Mr. George Ellinor (in the unavoidable absence of Mr. Eardley, the President, occupied the chair). There was a very fair attendance, and the following paper was read:—

RECENT RESEARCHES IN THE MICRO-STRUCTURE OF STEEL.

BY PROFESSOR ARNOLD.

The author said that Dr. Sorby had founded this research some thirty-five years ago, and did an enormous amount of valuable work in connection with it at that time, but since then, unfortunately, there had been no one to take up this important research, and consequently it had lain fallow. About seven years ago Dr. Sorby handed over to Professor Arnold the whole of his work, consisting of micro-slides and drawings, at the same time earnestly requesting Professor Arnold to follow up this important investigation. This he had done, and was still doing with many marvellous results, which from time to time he had placed before the public. Ordinary steel, he said, was not as commonly thought an homogeneous mass of metal. Far from this, it presented a structure very similar in appearance to that of limestone rock, showing well-defined crystals of pure iron, with some graphite and carbide of iron. To obtain a perfectly mathematical surface for microscopic investigation much care was necessary in the processes of grinding and polishing, passing as it must do through different stages from coarse emery to the finest precipitated rouge on picked wash-leather.

The etching process was done by macerating the section in very dilute nitric acid (1 C.c. of 1:2 acid

* *Proc. Chem. Soc.*, 1891, 189, 1892, 90.

to 199 C.c. water), taking care not to over or under etch. This process separated the pure carbon from the carbon compound imbedded between the iron^s crystals, leaving a blackened structure, and thus differentiated the section so that the various constituent crystals and carbon compound areas might be readily distinguished. The crystallising point of steel he had determined to be at a temperature of 740° C.

Professor Arnold then showed drawings from sections of normal, annealed, and hardened steels, which illustrated the structures obtained by varying the proportions of carbon put into them. A section containing .08 per cent. carbon showed only a small proportion of the compound areas, whilst .38 per cent. C. had a carbon compound area about equal to that of the pure iron crystals, the section somewhat resembling a mosaic pavement. When .89 per cent. C. was reached, the whole of the iron was converted into carbon compound, and he would call this the "saturation point of steel."

This was a fact which had never before been actually demonstrated. The foregoing applied to the normal steels. Annealed steels were next shown with similar percentages of carbon. The "pearly compound" of Sorby here proved to consist of the aforesaid carbon compound areas, from which carbide of iron, Fe_3C , had separated out in plate-like layers. Other technical points followed.

A discussion took place at the close of the lecture, in which Messrs. Ellinor, Newsholme, Ibbitt, and Marshall took part, and a hearty vote of thanks was accorded Professor Arnold for his very valuable lecture.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

At the meeting held on Thursday, March 21, Mr. W. L. Currie presiding, the following communication was read:—

LABORATORY NOTES.

BY R. BRODIE.

I find, on referring to an old minute book belonging to the Association, that it was in the year 1863 I wrote a paper on "The Preparation of Tinctures by Percolation."

The process was not much in vogue at that date, and the paper was very severely criticised by those who thought that the process of maceration was the best because it was the simplest and entailed the least amount of trouble. Although it was mentioned in the Ed. Ph. as an alternative process in the preparation of some tinctures, there was no attempt at explaining the *modus operandi*, or describing the apparatus required, hence, perhaps, the reason why the process was not more generally adopted.

Standing up for the superiority of the process in 1863, after a very few years' experience, I can, with an

extended experience of fully thirty years, confidently affirm that it is not only the most efficient, but that it is the most economical method.

My information as to the nature of the apparatus required, and as to the mode of procedure after having obtained it, was derived from Mohr and Redwood's 'Practical Pharmacy.'

My first percolator was a Crosse and Blackwell's ketchup bottle, the bottom of which I cut off with a file. I followed faithfully the directions as to putting coarsely pounded glass at the bottom of the percolator (in this case it was the neck of the bottle), then a layer of clean sand, next the species to be operated upon, last the spirit. After the spirit had all passed through I poured water on the surface for the purpose of displacing the spirit or tincture remaining in the marc, but I never found this part of the process successful, and at one of the meetings at which the discussion on the paper took place, I mentioned this as a drawback, when Dr. A. M. Robertson, who was then President of the Association, pertinently asked, Why not use the tincture press? Acting on the suggestion, I used the press, and found it much more effectual than the attempt at displacement by means of water, and, of course, I have continued to use it ever since.

The displacement of the tincture remaining in the marc by means of water is still followed and advocated by some, but my experience bears out the truth of the remarks on the subject in Mohr and Redwood's 'Practical Pharmacy.'

I soon discarded the coarsely-pounded glass and the sand at the bottom of the percolator, using only a disc of cork resting on the ledge at the bottom as a foundation for packing the ingredients upon.

The process is now officially recognised and adopted in a somewhat modified form by the compilers of the B.P., but I stick to the old method.

Mr. Dunlop, in the paper which he read before the Association a few weeks ago, I think recommended the advisability of all following the directions given in the Pharmacopoeia for galenical preparations, in order that these might possess the same physical characteristics and strength from whomsoever obtained, but while this might be very desirable, and would, perhaps, tend to do away with the remark occasionally made by customers that this is not like what was got elsewhere, yet I do not think such a result, however desirable, could be obtained, unless these directions were more full or explicit.

The directions for preparing most of the tinctures might have been stereotyped, although applied to different quantities and to different qualities. For instance, one ounce fol. bellad. in No. 20 powder is directed to be macerated in fifteen ounces of spirit for forty-eight hours, then transferred to a percolator, and when the fluid ceases to pass the percolation is to be continued by adding an additional five ounces of spirit. Afterwards the contents of the percolator are subject to pressure, and, after mixing the liquids, the product is made up to one pint of spirit.

In the case of tinct. ergotæ, the quantity of ergot is five ounces, which is directed to be finely comminuted,

and it is to be treated in the same manner as the ounce of fol. bellad.

Now after percolation is finished, and the marc pressed, which of them will require the most spirit to make up the quantity to one pint? Will it not assuredly be the tinct. ergotæ? And the quantity to be added will depend upon how much has been obtained out of the marc by pressure, which is bound to vary according to the amount of pressure brought to bear upon it.

Now while five ounces of spirit may be able to displace the tincture retained in the case of belladonna, no one will assert that the five ounces of spirit is capable of displacing the tincture retained in the case of ergot, so that the strength of the finished product will depend upon the strength of the tincture press to some extent, so I fear that there is not much chance of obtaining the result desired by Mr. Dunlop (see Redwood).

Again, in the case of tinctures made by percolation in wholesale quantities, say, twenty gallons at a time, it would be unreasonable to insist upon the same methods being followed as in the case, say, where a gallon or half a gallon is prepared.

So that while an operator on the small scale might be disposed to follow the directions laid down, the wholesale operator must be allowed to be the best judge of what method is most and best adapted for preparing galenicals in his own laboratory and with his own apparatus.

And now I would like to say something in regard to concentrated infusions. The objections to the use of these most convenient preparations are founded either upon sentiment or upon an erroneous idea as to their manufacture or upon the presence of spirit. With the hyper-conscientious individual, who takes up on principle the position that because they are not official therefore he cannot use them, there is no use arguing; but with the individual who has somehow got into his head that in their preparation they are subjected to so much long and continuous application of heat, that not only is their aroma destroyed, but their medicinal virtues either destroyed or very much impaired, and therefore he does not use them, a little verbal explanation ought to be sufficient for removing his objections; and the individual who objects to their use because they contain a proportion of spirit necessary for their preservation, which does not require to exceed 15 per cent., is scarcely worth arguing with.

Mr. Dunlop in his paper falls foul of these preparations, and uses language which seems much more forcible when read in print than it seemed to be as he read it before the Association.

With regard to the time of infusing being reduced so as to foster the dispensing of freshly-made preparations, I do not know whether that is so, but of course this shortening of the time must have been of material benefit to those who continue to use the freshly-made infusions, and in West End or other aristocratic localities where servants abound, and where it is not much trouble to send for medicine, it is quite easy telling them to call again in an hour or

two, and it is quite easy for them to call, but in East End or working-class localities servants do not abound, and very often it is an obliging neighbour who goes for the medicine, and who, having her own house duties to attend to, cannot conveniently call back; it is in such cases that the advantage of the concentrated preparations is appreciated.

I do not intend entering into an explanation of the methods followed in making concentrated infusions. Most of those present are aware that they are made by exhausting the drug with cold water, and if any evaporation is necessary, it is only of the last and weakest portion of the percolate, which is not likely to possess any aroma and very little of the active ingredient.

But objecting to countenance concentrated infusions, even if heat were employed in their preparation would be something like straining at a gnat and swallowing a two-humped camel, as I will endeavour to show. If the long and continuous application of heat is officially recommended in the manufacture of these preparations, it is surely out of all reason to object to concentrated infusions on the ground of heat being employed in their manufacture.

But with regard to the time required being now shortened or whether the shorter time gives a more satisfactory preparation, I do not intend saying anything, only this, that the shortened time possesses little advantage when the prescription is presented just when the shop is about to be closed.

I would like to mention the little inconveniences the official formula for inf. gentian is likely to produce if a freshly prepared infusion is ordered. Should I keep a supply of lemons so that the fresh lemon peel may be at hand when a prescription, say, for two or four ounces is handed in, or purchase a lemon in the morning, and throw it away at night if it has not been required—as is done, I believe, in certain establishments with infusions, where they are made fresh every morning and if not used thrown out at night—or should I wait till a prescription does come in and then send to the nearest greengrocer, who may be half a mile away, for one? And then look how lemons vary, at one time large and juicy and at another small and shrivelled, and sometimes not obtainable at all, being out of season; and yet we are expected to make our infusion at all seasons.

There was a formula for mist. gent. in the Pharmacopœia, 1867, which was deleted in the 1885 edition, and in an article by Charles Umney, on the British Pharmacopœia, 1885, published in the *Pharmaceutical Journal*, he refers to this preparation as one of the discarded, and says it was in little demand and there would be no regret at its omission; it was originally transferred to a former British Pharmacopœia from the Edinburgh Pharmacopœia. But it did not exist in that pharmacopœia as mist. gent., but as inf. gentian, the name being changed because the London formula was also retained and there could not well be two preparations having the same name; but by changing the name the identity was lost, and it could not be expected that medical men who had written inf. gent. for many years could at once drop

the habit and write mist. gent.—hence the falling out of use of the latter. But let us compare the formulæ of the two preparations:—

Inf. Gentianæ., B.P. 1867.	Mist. Gentianæ., B.P. 1867.
Gentian root 60 grs.	Gentian root ½ oz.
Bitter orange peel. 60 "	Bitter orange peel. 80 grs.
Fresh lemon peel... ½ oz.	Coriander fruit ... 30 "
Distilled water...to 10 "	Proof spirit 2 fl. oz.
	Distilled water...to 8 "

Which of them would be most serviceable as a tonic? Except as a flavouring agent, I know of no other virtue lemon peel possesses, for I never heard of its possessing tonic or any other medicinal property.

But let us look at the question of infusions from another aspect. The dose of most of them is given in the Pharmacopœia as from 1 to 2 ounces, some 2 ounces. I think the dose is from 2 to 4 ounces. Does anyone nowadays get prescriptions containing infusions where the dose prescribed is even an approximation to that?

Is it not rather the case that the infusion is put at the end of the prescription, as if it were only the vehicle in which to administer the other more active ingredients, and the quantity seems to be of no account?

In a four ounce mixture you may have 2 or 2½ ounces, with teaspoonful doses; in a six ounce mixture you will rarely see more than 4 ounces with dessert-spoonful doses; and in eight ounce mixtures rarely more than six ounces with tablespoonful doses.

The days of large doses are over and gone: the *multum in parvo* has taken their place, so that the sooner the old primitive weak watery infusions are done away with, and the more potent and useful concentrated infusions officially recognised, the better.

Mr. Brodie produced a number of specimens in the way of roots, barks, and such like, which he had reduced to moderately fine powder by putting through a coffee mill he devoted to that purpose, and also specimens of liquid extracts, concentrated infusions, syrups, etc., as prepared by him, of which liquid extract of cascara, conc. inf. senegæ, and liquid extract taraxacum were particularly fine.

The paper was well criticised and a cordial vote of thanks accorded.

Correspondence.

A PHYSIOLOGICAL DISCOVERY IN CONNECTION WITH THE CIRCULATION OF THE BLOOD.

Sir,—The reviewer of my paper on the above subject has evidently only glanced at it; he cannot possibly have read it, as my theory is clearly stated and should be easily comprehended by a competent critic. Ridicule is a very powerful weapon, but before hurling its darts my reviewer would have been wise had he been more truthful or careful in his reading. May I ask him through your columns to quote the page and line of my pamphlet in which I state that I have had under examination the livers of a sheep? I fail to find any such passage. He is pleased to say that "for want of a familiarity with anatomical and physiological terms the description of the observations on

which the author founds his views is, as yet, incapable of being interpreted, and so it is impossible to criticise." Am I to regard this as a confession of ignorance on his part? Or does he take exception to the terms I have employed? I shall be glad to be corrected where I have erred. *Ne sutor ultra crepidam*—I beg pardon—*Ne sutor supra crepidam*. The cobbler, if a cobbler, should undoubtedly stick to his last, it is better to be even a respectable cobbler than a jack of all trades and master of none, but master minds have in all ages been furnished with original ideas, and the world is certainly richer for the discoveries of such men as Galileo, Harvey, Newton, Faraday, and numerous others whose theories have not always been favourably received by the so-called scientists of their day and generation. In justice to me I ask for the insertion of this letter in your next issue.

Grantham.

F. D. FISHER.

. In reference to Mr. Fisher's complaint that he has been misquoted, the Reviewer writes that on comparing his review with the original paper, he finds that he has quoted "the livers of a sheep," instead of "the livers of sheep," and much regrets that he had inadvertently done Mr. Fisher that injustice. [Ed.—*Pharm. Journ.*]

AQUA CAMPHORA.

Sir,—I have long considered aq. camph. a very unsatisfactory preparation, both on account of its rule-of-thumb mode of solution and consequent variation in strength. Would it not be an improvement to make it by adding a definite quantity of camphorated spirit to distilled water and shaking till dissolved? I am aware this is very "low game," but our "revisers" might condescend to consider even it.

Scarborough.

ALFRED JONES.

THE MAJOR EXAMINATION.

Sir,—Seeing my suggestion "That the subjects for the Major examination might be taken one or more at a time at the discretion of the candidate" has been favourably received, and hopes expressed that it may be brought before the Council for consideration; this I would endeavour to do if all who are interested would signify their assent and willingness to co-operate by sending me their full names and addresses to be copied upon sheets, (as it would obviously be impracticable to obtain the autograph signatures on the sheets to be presented to the Council) and also any suggestion or reason that would carry weight in favour of the concession.

St. Austell.

S. C. FREDERICK MICHELL.

Answers to Correspondents.

J. H. Coleman.—See the *Epitome* for February 23, page 70.

F. B.—Apply to the Registrar of the General Medical Council, 299, Oxford Street, London, W., for the particulars you require.

A. H. Solomon.—Your letter with enclosure has been handed to Messrs. Street, Bros., 5, Serle Street, W.C., to whom it should have been addressed.

Pharmaceutical Chemist.—You have omitted to authenticate your letter with your name.

COMMUNICATIONS received from Messrs. Allen, Attfield, Austen, Bos, Brown, Clarke, Coleman, Coull, Cripps, Duncan, Evans, Harrison, Heron, Hill, Howie, Kirkby, Lyon, Maben, Martin, Michell, Roberts, Shaw, Smith, Umney.

THE DISCOVERY OF OXYGEN.

(Concluded from page 624.)

ANTOINE LAURENT LAVOISIER.

Lavoisier was born at Paris on August 26, 1743. He was the son of a lawyer who belonged to a wealthy family, and was educated at the Collège Mazarin, where he studied, amongst other subjects, botany, chemistry, geology, mathematics, and mineralogy. Though he qualified for the legal profession his inclinations led him to devote himself later to science. In 1768, he was elected a member of the Academy of Sciences, and as director of that august body he fought vainly for its existence during the French Revolution. Unfortunately, also, he incurred the enmity of Marat by contradicting the assertion of the latter, that an absurd essay he had published on the nature of fire had received the approval of the Academy.

Early in 1768, Lavoisier entered the *Ferme générale*, or body of financiers which rented the right of collecting the indirect taxes throughout France, as assistant. He became a *fermier général* in 1779, and occupied that position, discharging his trust honourably, until March 20, 1791, when the National Assembly suppressed the institution. He was also appointed to superintend various industries, such as the manufacture of tobacco and gunpowder, and as secretary of the Committee of Agriculture became interested in the cultivation of economic plants, the establishment of experimental farms, etc. About 1787, as a member of the Provincial Assembly of the Orléanaise, he was engaged in introducing schemes for founding banks and insurance societies, and forming canals, whilst two years later he was elected a member of the Commune of Paris, and in 1790 was sent to the States-General.

The strictest integrity and most honourable distinctions failed, however, to protect the distinguished chemist during that period of acute national disturbance known as the Reign of Terror. On November 28, 1793, he was arrested by order of the Convention and tried on the charge of having, as *fermier général*, added water and other ingredients, detrimental to the health of the citizens, to tobacco. He was condemned to death, and a memorial in his favour presented to the judges was rejected by the president of the tribunal, Coffinhal, with the remark that the Republic had no need of men of science, and justice must take its course

(*La République n'a pas besoin de savants; il faut que la justice suive son cours*). On May 8, 1794, therefore, he suffered death on the guillotine within twenty-four hours of receiving sentence, and at the age of barely fifty-one years.

In 1765, Lavoisier contributed his first paper to the Academy of Sciences, explaining in it why plaster of paris sets when mixed with water, and also why over-burnt gypsum cannot be re-hydrated. In the course of the same year he turned his attention to the artificial lighting of towns, and was awarded a prize by the Academy for an essay on the subject. He concluded in 1770 that water could not be converted into "earth," after heating some in a closed vessel for 101 days, and it is noteworthy that he employed the balance in this investigation. Two years later he began to investigate the phenomena of combustion, and observed that when

sulphur and phosphorus are burned an increase in weight takes place. He next examined the kind of air given off during respiration, combustion, and fermentation, confirming the results of Black, who showed (1755) that it is a peculiar constituent of carbonated alkalies, differing essentially from common air, and named it "fixed air." Lavoisier went further, however, and proved that it is an oxide of carbon, being thus the first to properly explain its chemical nature. In 1772, the year that Lavoisier began his investigation of the phenomena of combustion, Rutherford had made the important discovery that atmospheric air naturally contains a substance which is incapable of supporting combustion or respiration, and to this he applied the name "nitrogen." Priestley about the same time arrived



ANTOINE LAURENT LAVOISIER.

at a similar conclusion, differing only in that he imagined the gas to be air rendered impure by the addition of phlogiston. He named it, therefore, phlogisticated air. Lavoisier also experimented with this gas, isolating it by burning phosphorus in a confined volume of air, and found that it constituted four-fifths of common air. He was the first to regard it as a simple body, and called it first "mouffette atmosphérique," and later "azote." The information thus obtained, added to the facts disclosed in experimenting on the calcination of lead and tin, enabled him to arrive at the conclusion that air consists of two different elastic fluids. This was in 1774, but it was not until the following year that he distinctly mentioned oxygen gas (as *l'air éminemment respir-*

able, *pur*, or *vital*), and showed that the whole theory of combustion was clear to him. Finally, the discovery of the compound nature of water by Cavendish, in 1783, enabled Lavoisier to complete his theory of combustion and prove conclusively by experiments that the phlogistic theory was incorrect, the outcome of his work being that the science of chemistry was placed on its true basis.

LAVOISIER'S WORK ON OXYGEN.

During Priestley's researches he found that when lead or tin was calcined in a closed vessel absorption of air took place, but, a confirmed phlogistonist, he failed to connect this phenomenon with the augmentation of weight that occurred in the heated substance. Lavoisier, during the same year (1772), noted the same fact on burning phosphorus and sulphur, and, in a communication to the Academy of Sciences, expressed the opinion that in this case, as also in the calcination of metals, the increase of weight was due to the absorption of air, which was again liberated when the metallic calces formed were reduced with charcoal. It will thus be seen that, whilst both investigators were simultaneously progressing in the same direction, the French chemist was quick to perceive the true bearing of his observations, whilst Priestley* made no attempt to explain why the air diminished when combustion took place in a confined space.

Prior to 1773, Scheele had obtained oxygen (fire-air) from various substances, but the published account of his experiments did not appear until 1777, being anticipated by Priestley's account of the same discovery, which appeared about two years earlier, though Priestley did not isolate his "dephlogisticated air" and recognise it as a distinct substance until August, 1774. Visiting Paris during October of the same year, Priestley mentioned at Lavoisier's table, when "most of the philosophical people of the city were present," that he had obtained from red precipitate and red lead "a kind of air in which a candle burnt much better than in common air." Lavoisier repeated Priestley's experiments, and rightly concluded that the "dephlogisticated air" of the latter was identical with that constituent of air which he had found that metals and other bodies absorb on burning. Proceeding with his investigations, he observed that acids were produced when the majority of substances examined combined with the new gas, which he accordingly renamed "*oxygène*" (*ὀξύς*, sour, and *γεννάω*, I produce). Subsequently, in his '*Éléments de Chimie*,' published in 1782, he claimed that he had discovered the gas independently.†

Though this claim cannot be substantiated, and does not at all redound to the credit of Lavoisier, it is not so clear that he was not the first to arrive at

the conclusion that the newly discovered gas was the constituent of the atmosphere essential to combustion, respiration, and the calcination of metals. He was undoubtedly much more capable than Priestley of appreciating the nature of the phenomena in which the gas plays a part. Yet, in a memoir on the calcination of lead and tin, published in November, 1774, though he expressed the opinion that air consists of two gases, one only of which was capable of supporting combustion and respiration, he did not express any decided view as to their nature. In the experiments he describes, when lead and tin were heated in a closed flask they did not change in weight, but when the neck of the flask was broken, air rushed in and the weight was increased by a portion of the air being taken up by the molten metal. The residual air in the flask was noted to be different from common air and also from fixed air (carbon dioxide).

The first distinct recognition by Lavoisier of the fact that the gas obtained on heating red precipitate is the same as the constituent of atmospheric air which supports combustion, is found in a paper read near the latter part of 1775. During the same year he first put forward his views on the nature of combustion and respiration, in the form of a hypothesis. Scheele's results, as already mentioned, were published in 1777, and in the following year Lavoisier first mentioned the gas as "*oxygène*" or the acidifying principle. In a second memoir on the nature of combustion and respiration, published by the Academy in 1783, Lavoisier definitely denied the existence of any "principle of combustibility," and stated that carbon, sulphur, the metals, etc., are simple substances which on combustion enter into combination with oxygen.

THE COMPOSITION OF WATER.

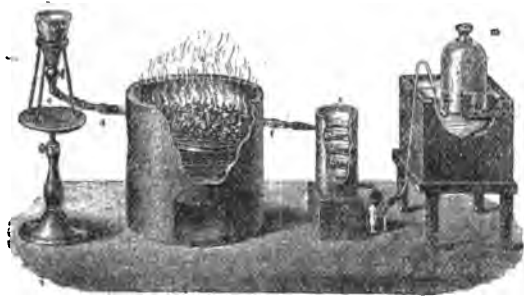
During the year 1781, Cavendish had determined that 100 volumes of common air contain 20·8 volumes of pure air (oxygen), and was led by some observations of Priestley and Warltire to study the effects produced by exploding definite volumes of inflammable air (hydrogen) and common air. Water was found to be produced, and in a paper published in 1784 Cavendish stated that "423 measures of inflammable air are nearly sufficient to phlogisticate 1000 of common air," or "almost all the inflammable air and about one-fifth of the common air are turned into pure water." He also identified the portion of the common air that was absorbed with Priestley's dephlogisticated air, and showed that when one volume of this combined with two of inflammable air, the only product was pure water. Like Priestley, however, he allowed the phlogiston hypothesis to warp his ideas, and probably never clearly realised that water is a chemical compound of the two elementary gases, though James Watt, in 1783, had expressed the opinion that water is composed of dephlogisticated and inflammable airs.

The particulars concerning Cavendish's experiments becoming fully known, they were repeated, and the results obtained confirmed by Lavoisier and Laplace. In the apparatus employed by Lavoisier, the water contained in the vessel *a* was allowed to drop slowly into the tube *e d*, and then flowed into the gunbarrel *d f*, which was heated to redness in the furnace. As the water was decomposed in the gunbarrel, the oxygen united with the heated iron, and the hydrogen passed through the worm *s*, where

* The casual way in which Priestley experimented is revealed in the passage in his published writings, where he remarks:—"In looking for one thing, I have generally found another, and sometimes a thing of much greater importance than that which I was in quest of."

† "*Cet air que nous avons découvert presque en même temps, M. Priestley, M. Scheele, et moi, a été nommé par le premier, air déphlogistique; par le second, air empiréal. Je lui avais d'abord donné le nom d'air éminemment respirable: depuis, on y a substitué celui d'air vital,*" and, later, "*Nous avons donné à la base de la portion respirable de l'air le nom d'oxygène, en le dérivant de deux mots Grecs, ὀξύς, acide, et γεννάω, j'engendre.*"

any undecomposed steam accompanying it was condensed. Finally, the hydrogen was collected and measured in the glass bell jar *m*, standing in a pneumatic trough. As a result of this experiment, it was found that 22.9 volumes of hydrogen entered into combination with 12 volumes of oxygen.*



LAVOISIER'S APPARATUS FOR DECOMPOSING WATER.

Lavoisier was now able to explain that the solution of metals in acids, no less than their combustion, is due to the oxygen taken up, in the first case from the water present, as in the other from air. He regarded the solution of a metal in a dilute acid as a two-fold reaction; first, the metal decomposed the water, liberating the hydrogen, and combined with the oxygen to form a calx; secondly, this calx combined with the acid to form a salt soluble in water. This explanation was entirely opposed to the ideas current at the time it was propounded, but gradually replaced the latter and was generally accepted until quite recent years.

The discovery of the compound nature of water has been claimed for Lavoisier, and it would certainly appear that in 1774 he was persuaded that the combustion of hydrogen consisted in the fixation of some portion of atmospheric air, and suggested that this would probably be accompanied by an increase in weight. But the most that can fairly be ascribed to him is priority in giving the true explanation of the experimental results recorded by Cavendish and confirmed by himself. The true position of affairs has been stated as follows:—Cavendish first ascertained the facts, Watt first argued from these facts concerning the true nature of water, and Lavoisier first clearly recognised the compound nature of the liquid, and determined exactly the proportional amount of its components.

OVERTHROW OF THE PHLOGISTON THEORY.

These two facts, then, the discovery of oxygen by Scheele and Priestley, and the determination of the composition of water by Cavendish, served Lavoisier as his chief weapons in completing the downfall of the doctrine of phlogiston, the absurdity of which is pointed out in the following passage:—"Chemists have made a vague principle of phlogiston which is not strictly defined, and in consequence accommodates itself to every explanation into which it is pressed. Sometimes this principle is heavy, and sometimes it is not; sometimes it is free fire, and sometimes it is fire combined with the earthly element; some-

times it passes through the pores of vessels, and sometimes they are impenetrable to it; it explains at once causticity and non-causticity, transparency and opacity, colours and the absence of colours. It is a veritable Proteus, which changes its form every moment."

At the same time, though the phlogiston theory had acquired an undoubtedly maleficent influence, and its overthrow had become a vital necessity, as pointed out by Roscoe and Schorlemmer, if in place of the word "phlogiston" we read "energy," the old theory becomes the expression of the latest development of scientific investigation. The original phlogiston was, according to Stahl, a very subtle, invisible substance, devoid of physical properties, and diffused generally through combustible bodies, which lost it on heating, whilst they regained it once more on re-heating the products with charcoal, wood, or oil—substances supposed to be rich in phlogiston. On the other hand it is now known that the combination of two elements invariably results in the evolution of energy, generally in the form of heat, whilst the resolution of the compound formed into its constituent elements involves the expenditure or absorption of an equivalent amount of energy. Regarded in this light, therefore, the theory may be regarded as still prevalent, though the existence of the hypothetical phlogiston is utterly discredited. The favour with which the theory was received and the hold it maintained so long were due to the simple interpretation it gave of the phenomena of reduction, combustion, and calcination. It failed, however, to explain the part played by the air in the phenomena of combustion, and was therefore bound to go when Lavoisier had clearly established his theory of combustion, based on an exact knowledge of the properties of oxygen.

INFLUENCE OF LAVOISIER'S WORK.

The general tendency of Lavoisier's life-work is well revealed in the foregoing account of his work on oxygen and the problems involved in its discovery. He was more a systematist than a discoverer, co-ordinating and generalising the results of others rather than ascertaining facts, and occasionally he so far forgot what was due to his own dignity as to seek to appropriate the credit of first attaining those results. However, by unconditionally rejecting ideas that had been handed down from the time of the old alchemists, which by their persistency prevented Priestley, Cavendish, and Scheele from arriving at the logical conclusion of their labours, he was much more advantageously situated than his contemporaries, and proportionally more successful from the point of view of chemical philosophy. Again, though Black, Cavendish, and other chemists had done accurate quantitative work, it was Lavoisier who definitely and fully inaugurated the era of quantitative chemistry, by his incessant use of the balance as an instrument of research.

The proof that combustion is not a decomposition but a combination, became in his hands "at once a victorious arm against the theory of phlogiston, and the corner-stone of a new system (Wurtz)." He proved that matter is neither created nor destroyed in chemical changes; established the elementary nature of the metals; recognised as simple bodies those only which yield

* Cavendish's proportions of 2 of hydrogen to 1 of oxygen were confirmed, however, by the more exact experiments of Gay-Lussac and Humboldt, in 1805.

but one kind of matter; showed how such simple bodies unite to form compounds; defined acids, oxides, salts, etc.; and thus formed the basis of modern chemistry. In addition, still absorbing and giving a more extended value to the ideas of others, he supported Morveau's suggested system of chemical nomenclature, which contained the germ of that now in general use, and, aided by Berthollet and Fourcroy, adapted it to the new theory.

Though prematurely cut off at the height of his activity, Lavoisier was fortunate in seeing his explanations accepted almost generally. Scheele has been described by Wurtz as dying an energetic defender of the word "phlogiston," though no longer a fully convinced partisan of the theory connected with it; Cavendish's last publication was an elaborate and ingenious defence of that theory, but he is said to have subsequently withdrawn his opposition to the new ideas without actually surrendering; and of critics of note, perhaps Priestley alone never ceased to oppose antiphlogistic principles, and carried his belief in the hypothesis that had led him so far astray to the end. The triumph of Lavoisier's work, then, was complete. He found chemists exclusively occupied with the outward appearance of facts—the qualitative side of phenomena—and inaugurated what is now recognised as the only true method of chemical research, based on quantitative work. Near the close of the seventeenth century, Robert Boyle—by contesting "the doctrines of the four elements, and the three chymical principles of mixed bodies," and by clearly distinguishing between mixtures and true chemical combinations—inaugurated the birth of scientific chemistry as distinguished from alchemy. In like manner, a hundred years later, Lavoisier founded a remodelled and thoroughly scientific theory of chemistry, by the "happy co-ordination of the apparently isolated and vaguely expressed items of knowledge of his day into a harmonious and perspicuous whole."

THE DETERMINATION OF ACONITINE.

BY JOHN C. UMNEY.

I was engaged for some nine months in 1890-91 in an investigation of the alkaloidal constituents of *Aconitum napellus*, in the Research Laboratory of the Pharmaceutical Society of Great Britain, and it was suggested by the Director, on the completion of that work, that I should continue, independently, my work on this subject, more especially as regards the determination of crystalline aconitine in galenical preparations, with a view to their standardisation.

The constitution of aconitine having been now more clearly defined, its determination, based on such knowledge, has been rendered possible by any accurate process in which the proportion of acetic acid resulting by its decomposition (either by heating to a high temperature or by hydrolysis) is ascertained.

The latter method of decomposition has been adopted, since the benzoic acid produced under those conditions, both from aconitine itself and benzaconine (existing as such in the plant or converted into such in the manufacture of galenical preparations), does not interfere with the determination.

I have devised a process which depends on the decomposition of aconitine by complete hydrolysis into aconine, acetic and benzoic acids, the former of which acids is derived from the crystalline aconitine, the latter from the intermediate product, benzaconine, formed during the hydrolysis in the case of pure aconitine or in the case of commercial alkaloid or total alkaloidal residues from that body, as well as any benzaconine present originally as such.

It is obvious that the presence of any alkaloid other than aconitine, yielding acetic acid on hydrolysis, the discovery of which has not hitherto been announced, would slightly modify the result based on the determination of this acid, but such body, if present, can only exist in very small proportion in *Aconitum napellus*.

The process may be briefly described as follows:—

A definite weight of alkaloid or total alkaloidal residue is completely hydrolysed by heating on a water bath for two hours, in a flask fitted with a reflux condenser, with a certain volume of alcoholic solution of a caustic alkali. The acetic and benzoic acids thus produced combine with the alkali present, the amount which has entered into combination being determined by difference by titration of the uncombined alkali with a volumetric solution of acid.

The solution after titration is again made markedly alkaline, and the alcohol dissipated on a water bath. To this is then added sufficient excess of hydrochloric acid to liberate the whole of the benzoic acid, which is removed by successive washings with ether. The benzoic acid is then weighed and the amount of solution of alkali which was required for its neutralisation in the first part of the process calculated. On deducting this amount from that of the total alkali required for neutralisation of the acetic and benzoic acids formed by hydrolysis, the amount required for neutralising the acetic acid formed, and thus the amount of crystalline aconitine present is determined.

I am engaged in adapting this process to the assay of the root and leaves of *Aconitum napellus*, with a view to the standardisation of their galenical preparations, but cannot complete these experiments until the definite dose of both pure crystalline aconitine and benzaconine are therapeutically determined.

I refrain, therefore, at present from detailing any of the results obtained in the experiments which I have carried out with commercial aconitine and total alkaloids obtained from the root, as well as the alkaloidal residue obtained by suitable treatment from the various galenical preparations. It may be observed, however, that calculating from either of the two formulæ put forward for aconitine, and at present under discussion, the amount of acetic acid produced by hydrolysis is practically identical, viz., 9.30 and 9.27 per cent. respectively, and final acceptance of either as correct will only affect in the slightest degree the determination of aconitine by this process.

The amount of benzaconine present as such, in a total alkaloidal residue, may obviously be determined by deducting from the total benzoic acid, liberated on hydrolysis from a definite weight of such residue, that proportion derived from the aconitine originally present, as shown by calculation from the acetic acid produced.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, APRIL 6, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

At the meeting last Wednesday the PRESIDENT announced that a communication had been received from Sir HENRY ROSCOE, as Chairman of the Weights and Measures Committee, asking him to give evidence on the subject. The date fixed for that purpose was found inconvenient, and consequently his attendance at the Committee would now be deferred until after Easter.

The additions to the Society comprised three pharmaceutical chemists and one chemist and druggist as members, forty-six associates, and nineteen students.

Among the nominees for election on the Council who have signified their willingness to accept office are the names of Messrs. BATESON, CAMPKIN, CORDER, SAVORY, and WILLS. Mr. THOMAS GREENISH does not intend to offer himself for re-election. The present auditors have again been nominated, and have expressed their willingness to accept office if elected.

The report of the Finance Committee showed that the receipts during the past month have been considerable, both to the general funds of the Society and to the Benevolent Fund. The donation account has been augmented by donations of one hundred pounds, and fifty pounds from the two sons of Mr. CHARLES MAW, and a legacy of one hundred pounds left by the late Mr. HOOPER, so that the balance now amounts to about four hundred pounds for investment. In moving the adoption of the report the PRESIDENT mentioned that Madame FERREIN, of Moscow, had informed him of her intention to continue the subscription of her late husband to the Benevolent Fund.

On the recommendation of the Benevolent Fund Committee, one grant of twenty pounds, one of fifteen pounds, one of ten pounds, and one of six

pounds were ordered to be paid. The Vice-President again drew attention to the case of MARY MARGARET LEWIS, a candidate for election to the girls' school, at Ashford, with the object of reminding members of the Society that this would be her last chance.

The report of the Library, etc., Committee, gave the usual statements of the attendance in the Library and Museum, the donations to Library and Museum, etc. It also recommended the carrying out of some decorative work in the Society's House, and better provision for the ventilation of some of the rooms.

Letters from the Sheffield Pharmaceutical and Chemical Society were read, thanking the Council for the grant recently made, and for the Calendar and Register for 1895. A letter from Mr. C. THOMPSON, the local secretary in Birmingham, stated that at a meeting of members and associates of the Society, held on March 29, it was resolved to request the Council to take immediate steps to remedy the evils resulting from co-operative trading. This communication was referred to the Law and Parliamentary Committee for consideration.

The auditor's report was presented, and after the report of the General Purposes Committee, dealing with legal matters, had been considered in committee, proceedings were afterwards ordered to be taken in several of the cases reported upon.

The Council then adjourned until the second Wednesday in May.

A THEORY OF ELECTROLYSIS.

The *Electrical Review* refers to the fact that in the introduction to his work on electro-chemistry, OSTWALD remarks that to a philosophic mind nothing is more fruitful than the historical study of a science, and points out that this statement is strikingly true of the science of electrolysis, to whose development OSTWALD has contributed so much. BUCHERER, it is stated, has recently engaged his attention upon this, and has emphasised the fact that of all conceptions that of the first and second laws of thermo-dynamics have done most in clarifying our views and in paving the way for new discoveries. The old preconceived notions, however, still exercise their vicious influence. BUCHERER has endeavoured to formulate a new theory which shall be innocent of the inconsistencies which surround and poison the generally accepted views. He expounds this theory in the *Electrical World*, and takes as the basis the mass law which in the thermodynamic treatment of chemical reactions has played so important a part. From the standpoint of the mass law, chemical equilibria are viewed as dynamical equilibria. BUCHERER regards the potential difference between a metal and its solution as directly due to the relation of the partial pressure of the metallic vapour with which it participates in the equilibrium and

the sublimation pressure of the immersed metal. This, remarks our contemporary, does not accord with the modern view of electrolysis as represented by NERNST's theory of a solution tension. BUCHERER has obviously followed the reasoning used by OSTWALD, the difference being that he deals with the partial pressures of the metallic vapour and the molecular non-metallic constituents of a solution, where OSTWALD and NERNST consider the osmotic pressures. BUCHERER's theory, however, leads to much the same results as the generally accepted theory in spite of the fact that, according to one of them, the number of ions increases by dilution, and to the other it decreases. He will be certain to attract much attention by his new theory, but, the commentator observes, it is another matter whether it will stand searching criticism.

EVENING MEETING IN EDINBURGH.

WE are requested by Mr. W. A. H. NAYLOR to point out a curious error in the otherwise excellent paper by Mr. MABEN, which appeared in last week's Journal (p. 846) Mr. MABEN, referring to Mr. NAYLOR's article in the Journal for March 9, states that the latter there recommended that potent remedies should have a strength of 10 grains in 100 minims. This is not correct, however, as "x grains" does not necessarily represent "10 grains," but must vary according to the standard adopted. In the sentence referred to by Mr. MABEN, "x" represents an unknown weight, and Mr. NAYLOR's intention was that, for the convenience of prescribers, 100 minims of the respective liquors should contain severally an integral quantity by weight of the potent substances, arsenic, strychnine, etc. Whether the proportion should be 1 or more grains in the 100 minims is left to the revisers of the Pharmacopœia to decide.

REGISTRATION UNDER THE MEDICAL ACTS.

THE MEDICAL REGISTER for 1895, which we have just received from the Registrar of the General Medical Council, shows an increasing tendency to bulkiness, since it now occupies fourteen hundred and forty pages. According to Table E, the total number of persons registered in the local registers or England, Scotland, and Ireland, since 1858, is 54,249, of whom 32,637 yet remain in those registers—19,499 in England, 8389 in Scotland, and 4749 in Ireland. Table F shows that 1426 persons were added to the Register in 1894, 71 were restored, and 504 were removed for various reasons. In 1893, 1579 names were added to the Register, that being the highest number on record, so that it would now appear that the numbers are beginning to decline. The new MEDICAL STUDENTS' REGISTER gives the number of students registered during 1894 as 989 in England, 485 in Scotland, and 197 in Ireland. The numbers in 1893 were 1007, 560, and 180

respectively. The total number registered during 1894 (1871) is identical with that for 1892, but less than that for 1893 (1747), and considerably less than that for 1891 (2405), which was the highest on record. The DENTISTS' REGISTER, which we have received at the same time as the above, gives the total of dentists registered as 4901. Of these 1363 are licentiates in dental surgery of the English, Scottish, and Irish colleges, and 3511 are in *bona-fide* practice of dentistry, in addition to 27 possessing American diplomas.

THE MAJOR EXAMINATION.

IN the discussion on this subject it will be observed that one of the contributors suggests that it is sufficiently important to deserve editorial comment. It may be pointed out, however, that whilst there is no objection to the columns of the Journal being open to discuss the matter, it is not desirable that the official organ should commit itself to a decided opinion upon the matter, which is essentially one to be considered by the administrative body of the Society, and may possibly be regarded as a question of principle rather than of mere expediency, though the latter seems to be the opinion of several of our correspondents. If such a change as is suggested should be effected at any time, there is little doubt that the standard of efficiency would necessarily be raised considerably in all the subjects, and candidates might find that after all, the present arrangement is the more convenient one. At any rate, those desiring to proceed further in the matter can take advantage of Mr. MICHELL's offer in last week's Journal (p. 856), and it will then be easy to get a definite opinion upon the proposition.

MODERN TELEGRAPHY.

THE *Daily News* of Thursday last describes a species of telegraphic communication which, though not new to the scientific world, may fairly be described as marvellous. The cable between Oban and the Isle of Mull being out of order, messages have been transmitted across the water, no connecting apparatus being employed, but the desired result has been effected by means of the well-known phenomenon of induction. A wire has been erected on the mainland opposite to and parallel with a portion of the telegraph line on the island, and the message which it is desired to communicate to Mull is transmitted over the wire on the mainland in the ordinary way. The signals thus transmitted pass at the same time over the parallel line in the Isle of Mull, and telegraphic operators there read them by means of a telephone. This is believed to be the first time the method has been turned to account in the practical, every-day work of telegraphy, the result being due to Mr. PRESCOTT and his assistants on the Engineering Staff of the Post Office.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, April 3, 1895.

Present—

MR. MICHAEL CARTMIGHE, PRESIDENT,

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT,

Messrs. Allen, Atkins, Bottle, Gostling, Hampson, Harrison, Hills, Johnston, Martin, Martindale, Newsholme, Southall, Storrar, Warren, and Young.

The minutes of the previous meeting were read and confirmed.

THE WEIGHTS AND MEASURES ACT.

The PRESIDENT said a communication had been received from Sir H. Roscoe, Chairman of the Weights and Measures Committee, asking him (the President) to give evidence, and fixing a day for his attendance, but that day was afterwards found to be inconvenient, so that his evidence would now have to be deferred until after Easter.

ELECTION OF MEMBERS.

Pharmaceutical Chemists.

The following having passed the Major examination, and tendered their subscriptions for the current year, were elected "Members" of the Society:—

McKenzie, Thomas Golspie.
Pearce, John Hammond Horwich.
Perkins, Catherine Susan Birmingham.

Chemist and Druggist.

The following who was in business before August 1, 1868, having tendered his subscription for the current year, was elected a "Member" of the Society:—

Dennis, James Edward Nottingham.

ELECTION OF ASSOCIATES IN BUSINESS.

The following having passed their respective examinations, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Minor.

Allen, James Bristol.
Andrews, Charles Russell Wappingers Falls.
Ayre, George Martin Perth.
Baker, William Charles Edinburgh.
Ball, Henry Simpson Nottingham.
Blankiron, Jeremy Edinburgh.
Chambers, John Wm. Parsons Nottingham.
Coates, Frederick Charles Nottingham.
Cripps, Ernest Charles Berkhamsted.
Dand, Arthur Liverpool.
Ferguson, Joseph Johnston Leytonstone.
Green, Walter Joseph Trowbridge.
Groth, Marthieu Gustave B. Hartlepool.
Hampton, George Reading.
Harris, George Robert Eastbourne.
Hopley, John Henry Chester.
Kay, William Cumnock.
Kaye, Alexander Perth.
Kerr, Hugh Dalbeattie.
Langbourne, Walter Charles Stockport.
McKenzie, James Singapore.
McNiven, James Falkirk.

Scott, Joseph Barrow-in-Furness.
Swinglehurst, Josiah Nelson.
Temple, Charles Herbert Eastbourne.
Turver, William Chester.
Urquhart, Robert Aberdeen.
Widdowson, Reuben Nottingham.
Wilkinson, William Franklin Blackpool.
Williams, John Wynn Mold.

Modified.

Adam, Thomas Glasgow.
Ashby, William Nottingham.
Bowman, John Leith.

ELECTION OF ASSOCIATES.

The following having passed the Minor examination, and tendered their subscriptions for the current year, were elected "Associates" of the Society:—

Bainbridge, John Kirby Stephen.
Brown, William James Dover.
Dobson, John Tongueland.
Duncan, Charles Tocher Dundee.
Fairweather, James Young Forfar.
Furnival, Charles Edward Leicester.
Innes, James Turriff.
Macintosh, Robert Grantown.
Morcombe, Joseph Pembroke Dock.
Shepherd, Joseph Henry Derby.
Simpson, Herbert West Hartlepool.
Tattersall, John London.
Turner, William Henry Workop.

ELECTION OF STUDENTS.

The following having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Broadbank, Albert Samuel Stockton-on-Tees.
Burrett, Frank B. S. London.
Deacon, Charles Henry Shipley.
Dexter, Bertie Nottingham.
Dodridge, William James Woolstone.
Edwards, Evan David Rhayader.
Heden, Joseph Henry Kineton.
Hill, Harry Ernest London.
Hogg, Walter Ulverston.
Horsley, Percy James London.
Jones, Robert Bryan Llanfyllin.
Lane, Herbert Princes Risboro.
Lewis, Moritz Avon Penzance.
Martin, Walter E. Beccles.
Oliver, John Bilston.
Owen, John Edmund Abergele.
Fratt, Charles Andrews Chichester.
Sinclair, James Aberdeen.
Waddingham, George Albert Batley.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a restoration fee of one shilling.

NOMINATIONS FOR COUNCIL AND AUDITORS.

The SECRETARY reported that he had received twenty-one nominations to fill the fourteen vacant seats on the Council, and that the following eighteen had declared their willingness to accept office if elected:—

Allen, Charles Bowen, 20, High Road, Kilburn, N.W.
Atkins, Samuel Ralph, Market Place, Salisbury.
Bateson, Thomas, 23, Stricklandgate, Kendal.
Bottle, Alexander, 37, Townwall Street, Dover.
Campkin, Algernon Sydney, 11, Ross Crescent, Cambridge.

Carteighe, Michael, 180, New Bond Street, W.
 Corder, Octavius, 31, London Street, Norwich.
 Grose, Nicholas Male, 8, Temple Street, Swansea.
 Hampson, Robert, Knole Paddock, Sevenoaks.
 Harrison, John, 33, Bridge Street, Sunderland.
 Hills, Walter, 225, Oxford Street, W.
 Martindale, William, 10, New Cavendish Street, W.
 Newsholme, G. T. W., 74, Market Place, Sheffield.
 Richardson, J. G. F., Elmfield, Knighton, Leicester.
 Savory, Arthur Ledsam, 143, New Bond Street, W.
 Southall, Alfred, 17, Bull Street, Birmingham.
 Wills, George Sampson V., "Southwood," Croham
 Road, South Croydon.

Young, John Rymer, 42, Sankey Street, Warrington.
 The following three nominees had not expressed
 their willingness to accept office:—

Greenish, Thomas, 20, New Street, Dorset Square, N.W.
 Powell, Thomas Henry, 116, Denmark Hill, S.E.
 Robinson, William Prior, 17, The Pavement, Clapham
 Common, S.W.

AUDITORS.

The Secretary also reported that he had received
 the following *five* nominations to fill the office of
 auditor, and that all the nominees had expressed their
 willingness to accept office if elected:—

Butt, Edward Northway, 77, Hamilton Terrace, N.W.
 Lescher, Frank Harwood, 60, Bartholomew Close, E.C.
 Stacey, Samuel Lloyd, 300, High Holborn, W.C.
 Umney, Charles, 50, Southwark Street, S.E.
 Yates, Francis, 64, Park Street, Southwark, S.E.

REPORT OF THE FINANCE COMMITTEE.

The SECRETARY read the report of this Committee,
 which recommended the payment of various accounts.

The PRESIDENT (as Chairman of the Committee)
 moved the adoption of the report. He said the receipts
 had been considerable during the month, mostly
 arising from subscriptions and examination fees. The
 payments were of the usual character. On the Bene-
 volent Fund account a fair amount of subscriptions
 had been received—viz., £304; and on the Donation
 account there was now a balance of about £400 in
 hand, it having been augmented by donations from
 the two sons of Mr. Charles Maw (one of 100 guineas,
 and the other of 50 guineas); and the legacy of £100
 left by the late Mr. Hooper had also been received.
 Looking at the present price of Consols it was not
 considered desirable to invest this balance at present,
 but rather to wait a little in the hope that a suitable
 investment in ground rents might offer. The amount
 of grants made last month was smaller than usual, but
 there would be no doubt more calls of that nature
 coming forward, and it was not proposed to invest
 any of the current balance from subscriptions. As he
 had said before, he considered it the duty of the
 Council to distribute the contributions received during
 the year to deserving cases, and not to invest the sub-
 scriptions for the benefit of posterity. He might add
 that he had received a very nice letter from Madame
 Ferrein, the widow of their late distinguished corre-

sponding member at Moscow, saying that on looking
 through her husband's papers she found a receipt from
 the Pharmaceutical Society for £1 subscription to the
 Benevolent Fund, and in accordance with what she
 knew would have been his wish, she should continue
 to contribute the like amount annually as long as she
 lived.

The report and recommendations were adopted.

BENEVOLENT FUND COMMITTEE.

The report of this Committee recommended the fol-
 lowing grants:—

£6 to a registered chemist and druggist (64) who is
 unable to support himself. (Stoke Newington.)

£20 to a registered chemist and druggist (70) till
 lately in business on his own account, but now without
 means. He has a sister of seventy-two dependent on
 him. (Clapham.)

£15 to the widow (51) of a member who had himself
 received six grants (totalling £85). Applicant is
 suffering from an incurable spinal complaint.
 (Harrogate.)

£10 to the widow (60) of a chemist and druggist
 who had grants of £10 in 1890 and 1891, and died in
 that year. (Camden Town.)

One case was deferred, and two were not enter-
 tained.

The VICE-PRESIDENT in moving the adoption of
 this report said its chief feature was the recommenda-
 tion of a grant to a poor old applicant, who had lived
 nearly half a century in the same place, and had made
 a sufficient sum year by year to keep a respectable
 appearance, and honestly to pay his way, but the
 pressure of competition and other circumstances had
 led to his asking for that temporary relief which he felt
 sure they all would gladly vote as a fit and proper means
 of distributing the Benevolent Fund. For himself he was
 glad that they were in a position to make grants in such
 deserving cases. Whilst speaking, he also desired again
 to direct attention to the case of Mary Margaret Lewis,
 a candidate for the girls' school at Ashford, and to
 remind local secretaries and others that this would be
 her last chance. He felt sure that they could not do a
 better or more substantial service than by educating
 a girl like this; and he should be glad if he could be
 the means, by interview or writing, of furthering her
 interests at this, the last available chance of thus
 assisting her.

The report was then adopted.

REPORT OF THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received
 and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
February	Day . .	432	25	13	18
	Evening .	169	16	3	8
Circulation of Books.		Total.	Town.	Country.	Carriage paid.
February . .		191	100	91	£1 5s. 1½d.

Donations to the Library had been announced
 (*Pharm. Journ.*, March 16, p. 805), and the Com-

mittee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

Chambers' Mathematical Tables.

Vines's Text-book of Botany, second copy.

Nernst's Theoretical Chemistry.

Museum.

The report of the Curator had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
February	Morning	522	40	12	21
	Evening	35	6	1	1

Donations to the Museum had been received (*Pharm. Journ.*, March 16, p. 805), and the Committee had recommended that the usual letters of thanks be sent to the respective donors.

The PRESIDENT, in moving the adoption of the report, said the repairs and cleaning necessary in different parts of the house had been referred to a special sub-committee, which had made a report, including a recommendation for the finishing of the rooms at the top of the house, No. 16, Bloomsbury Square, and the painting of the staircase. That report, however, did not include a matter which was rather serious, viz., the ventilation of the rooms upstairs, which were now to be decorated. Mr. Bottle had called attention to the fact that the system of ventilation introduced when the premises were built had proved, as was often the case, an absolute failure. The Tobin ventilators had been gradually improved upon or altered until there was practically no ventilation at all. He proposed, therefore, to add to the report of the Committee that the Council be authorised to deal with the ventilation of the four upper rooms of No. 16, Bloomsbury Square. The top room of all was very low, but the pitch of the roof was such that it would be easy, if thought desirable, to make an opening in the roof at a comparatively small cost, and to arrange for ventilating that room efficiently.

Mr. ATKINS asked what that room was to be used for.

The PRESIDENT said that had not yet been decided.

The resolution for the adoption of the report, with the addition mentioned by the President, was then unanimously agreed to.

CORRESPONDENCE.

The PRESIDENT said two letters had been received from the Sheffield Pharmaceutical and Chemical Society thanking the Council of this Society for their gift of the Pharmaceutical Calendar and the Register for 1895, and also for their generous grant of £25 for educational work.

Mr. CHARLES THOMPSON, the local secretary for Birmingham, wrote to say that at a meeting held on March 29, it was proposed and carried "That this meeting of members and associates of the Pharmaceutical Society, whilst thanking the Council of the Society for the able and vigorous way in which they have recently enforced the Pharmacy Acts, views the development of the branch system of co-operative trading as tending to the gradual destruction of individual pharmacy, and calls upon them to take immediate steps to remedy that evil."

On the suggestion of the PRESIDENT this was referred to the consideration of the Law and Parliamentary Committee.

AUDITOR'S REPORT.

This report was laid on the table as usual.

GENERAL PURPOSES COMMITTEE.

The report of this Committee, which dealt with legal matters, was read and considered in Committee.

On resuming, the report and recommendations were adopted, and a special resolution passed authorising the Registrar to take proceedings against the persons named. It was also resolved that the Registrar should be authorised to remove the name of John Blair Conner from the list of persons who have passed the Society's First examination.

THE COUNCIL MEETING IN MAY.

It was decided that the Council meeting in May should be held on the second Wednesday in the month.

EVENING MEETING IN EDINBURGH.

Friday, March 22, 1895.

MR. J. LAIDLAW EWING IN THE CHAIR.

(Continued from page 852.)

NOTE ON CHLOROFORM.

BY D. RAINY BROWN.

I would recommend that the properties and tests for chloroform be stated somewhat as follows in the new edition of the Pharmacopœia:—

CHLOROFORM, CHCl_3 .

A colourless mobile liquid of sweet ethereal odour. Sp. gr. not under 1.497 at 15°C. Soluble in all proportions in alcohol and ether and in about 200 times its volume of cold water.

Tests.—1. When distilled, the first 10 per cent. fraction and 15 per cent. residue should be free from colour and foreign odour, and the weight of the 15 per cent. residue, after evaporation at 32°C. till constant, should not exceed 1 in 900,000 parts (by weight).

2. On shaking with 10 per cent. (by vol.) of pure concentrated sulphuric acid for twenty minutes the acid should remain colourless or nearly so, and on diluting with water (3 vols.) the mixture should remain almost colourless and clear and give off only a slight foreign odour.

3. On shaking with an equal volume of zinc iodide and starch soln. (zinc iodide 1 part, starch 3 parts, water 500 parts), no colour should be imparted to the chloroform.

4. On shaking with an equal volume of silver nitrate solution no turbidity should be produced; and lastly

5. A water extract of the chloroform should be neutral to litmus.

It should be left to manufacturers to prepare all definite chemical compounds from whatever raw material and by whatever process they choose; but it is for the pharmacopœial committee to impose such tests as shall prohibit the sale of any but the purest of those compounds for medicinal purposes.

The B.P. recommends the addition of 1 per cent. of ethyl alcohol to chloroform, but at the same time

limits the sp. gr. to 1.497. This is obviously wrong, as the addition of 1 per cent. of alcohol to pure chloroform reduces the gravity to 1.4854 at 15° C., while the quantity necessary to give a product of 1.4977 sp. gr. is 0.25 per cent.

The addition of so much alcohol as 1 per cent. seems to be unjustifiable. If properly stored and kept out of sunlight, a chloroform of sp. gr. 1.497 can be kept for many years without undergoing decomposition; and the fact that such chloroform has now given satisfaction for over thirty years should be a sufficient argument for retaining the gravity at its present standard. The addition of 1 per cent. of alcohol will not prevent decomposition taking place, although the change will occur more slowly than in a chloroform containing 0.25 per cent. It might, however, be advisable to increase the percentage of alcohol in chloroforms which are to be used in countries which have a higher average temperature than our own.

The fractional distillation test enables us to detect impurities in chloroform which by the present B.P. methods escape observation.

The sulphuric acid test is a very useful one for the detection of an imperfectly purified chloroform, and its modification is still more delicate, as acid which has acquired little or no colour from the sample under examination often indicates impurity by dilution with water.

The most delicate test for the detection of decomposition in chloroform is the zinc iodide and starch one. By its minute quantities of chlorine, which is the first product of decomposition, can readily be detected, while silver nitrate solution gives no reaction until three times the quantity of chlorine necessary to react with zinc iodide and starch is present. For this reason the zinc iodide and starch test should be adopted, but not to the exclusion of the silver nitrate one, as it indicates the presence of chlorine compounds other than chloroform in samples in the more advanced stage of decomposition when zinc iodide and starch give no reaction.

It has been suggested to employ a solution of syrup of iodide of iron and starch instead of zinc iodide and starch, but I have not found it to be a more delicate reagent.

NOTE ON ALOIN.

BY D. RAINY BROWN.

The B.P. states that aloin is insoluble in ether. I have examined several samples from different sources and found that they are all soluble in pure ether, only slight residues of from 0.7 to 1.3 per cent. ultimately remaining undissolved. The residues in every case were mixtures of organic and inorganic matter. Aloin is, however, only very sparingly soluble both in cold and boiling ether.

OINTMENTS.

BY PETER BOA.

In introducing the subject of ointments for consideration this evening I shall endeavour—so far as I am in the limited time placed at my disposal

for the purpose—indicate the directions in which it appears to me discussion may most profitably be carried.

There are in the British Pharmacopœia forty-five ointments. About twenty of these I have in the course of a somewhat varied experience never seen dispensed. Of the twenty-five or so which I have seen dispensed some ten have very rarely been required. In my experience, therefore, only about one-third of the official ointments are commonly prescribed, and I learn from my fellow-chemists that my experience in this respect is not exceptional.

It may help us in considering the subject if we can ascertain the reason for the neglect which so many of them receive. I shall take one or two examples and indicate what appear to me to be their defects. Carbolic acid ointment is made with a basis in which the greater part of the acid is insoluble, and consequently crystallises in the ointment. If a prescriber once orders this ointment for any of the purposes for which a carbolised dressing is ordinarily used, I should be surprised if he prescribed it again. Aconitine, atropine, and veratrine ointments are highly poisonous and dangerous, and have largely been replaced by ointments or preparations of cocaine and menthol. Calamine is inferior to oxide of zinc in ointment. Creosote is efficiently replaced by carbolic acid and without smell. Glycerin of subacetate of lead ointment is meant to be soothing, but any soothing effect which the lead may possess is neutralised by the irritating nature of the paraffin basis with which it is combined. Elemi, resin, savin, and turpentine ointments are relics of a style of practice which is now, I am told, in disuse by the best practitioners. Spermaceti and simple ointments are not so much in use as they have been; the benzoin in the former spoiling it for ophthalmic use, and the readiness with which the former goes rancid has brought it into disfavour.

Beginning at the root of the matter, it is obvious that the bases employed in the preparation of the official ointments are not above question. Lard, benzoated lard, spermaceti, white wax, yellow wax, almond oil, suet, hard and soft paraffin, are the chief substances used either alone or in combination in their preparation. Adeps lanae is new, and is used only in hemlock ointment. The first requisite for an ointment is a basis perfectly free from rancidity. There is not any difficulty in obtaining lard, yellow wax, suet, almond oil in a sweet condition. Spermaceti and white wax, both freely used in our official ointments, are to my mind always in a state of at least incipient rancidity, and might without loss be omitted from the Pharmacopœia. Hard and soft paraffin do not become rancid, but they are not always bland, and it is difficult to know when they are or are not so. For suitably chosen ointment purposes, however, they are admirable. Adeps lanae promises to be a good basis. It is bland, homogeneous, and owing to the stable nature of cholesterolin fats keeps well. Its characteristic stickiness can be toned down by almond oil if blandness be required, or

paraffinum molle if this be not so important. With a variety of materials which we can employ in preparing bases I am not disposed to regard with favour a proposal to establish one common basis. However convenient this would be on the score of simplicity and uniformity, I am strongly of opinion that there should be no suspicion of sacrificing efficiency to uniformity. Efficiency first, and uniformity, if convenient, afterwards, strikes me as the proper order.

There might be a classification of certain ointments as regards strength and basis. Those which contain insoluble and not very potent substances might be of uniform strength, and have, possibly, a paraffin basis; while those with soluble active ingredients like carbolic acid and eucalyptus might be made alike in strength and with a fatty basis. If there be a basis in which the active ingredient is soluble that basis should be chosen for it, unless objectionable in some other way. On a previous occasion I have referred to the method of preparing certain ointments. In all the official ointments the ingredients of which are melted together the directions are to stir till cold. I have shown that in many of them this is unnecessary, and in some objectionable. Briefly, a stirred ointment is more liable to become rancid than one allowed to cool at rest, and in application the latter is stated to be more soothing and protective owing to its not containing air. A trial might be made of this process in one or two of the ointments to which it is applicable.

A basis of some non-fatty substance, which would wash off with water without soap might be useful. Tragacanth, starch, dextrin, and gum acacia, either alone or together, might be employed. Some more compound ointments of the sort now in use should be introduced. The compound ointments at present official are among the most useless in the book. If we are to have formulæ we may as well have useful ones. Bismuth, cocaine, and menthol are now much used in practice as ingredients in ointments. They might suitably be introduced in formulæ in the new pharmacopœia.

INFUSIONS.

BY WILLIAM LYON.

In considering the claims of the infusions upon the favourable notice of the Revision Committee, we are somewhat handicapped by the fact that we are dealing with a class of preparations which owe their prominent position in the Pharmacopœia more to the popularity of a few, and because they are the relics of an ancient art, than to the intrinsic value of them as a class. Whilst it cannot be denied that several of them, such as orange, gentian, and rose, are of much individual merit as pleasant adjuncts to other medicines, taken as a whole, more can be said against them than for them. That they are wasteful preparations will be admitted by everyone who makes them, and although it is not for a moment to be contended that that ought to be a crucial test for any formula, yet it ought never to be lost sight of. What between the amount of extractive that is left in the drug after the infusion has stood the specified time and the por-

tions of infusions which have occasionally to be thrown away—for the exact quantity cannot always be conveniently prepared—it is no exaggeration to say that, as a rule, from 20 to 25 per cent. of the value of the drug is lost. Take cascarrilla as an instance, when exhausted with warm water it yields about 13 per cent. of its weight of dry extractive, but only a little more than the half of that comes out in the first infusion.

Although there are twenty-eight infusions official in the B.P., in no other pharmacopœia do they occupy so much space. The German and Swiss pharmacopœias have only one each. The U.S.P. has, strictly speaking, three, the fourth being the equivalent of our mistura. Inf. sennæ composita would not be classed amongst them by British pharmacists. This indicates that in these countries they have been, to quote a well-known saying, "weighed in the balance and found wanting," a conclusion that finds considerable support amongst physicians and pharmacists in our own little island. The British are, however, an independent race, and are not accustomed to imitate their contemporaries without good reasons for doing so. It will therefore be necessary if we wish them thoroughly revised to show sufficient cause for inquiry being made by the authorities.

Table showing number of times ordered in
12,000 prescriptions.

Name.	Infusion.	Tincture.	Other Galenicals.
Anthemidis	—		Extractum 7; oleum 1.
Aurantii	49	194	Syrupus 796; Tinctura Recentis 36.
Aurantii Comp.	12		
Buchu	34	1	
Calumbæ	223	90	
Caryophylli	7		Oleum 26.
Cascarrillæ	67	11	
Catechu	—	51	
Chirata	12	14	
Cinchonæ Acid.	22	45	Decoctum 33; Extractum Liquidum 36; Tinctura Comp. 177.
Cuspariæ	—		
Cusso	—		
Digitalis	11	300	
Ergotæ	1	2	Extract Liquidum 66.
Gentianæ Co.	235	143	Extractum 103.
Jaborandi	1	5	
Krameria	2	17	
Lini	1		
Lupuli	—	3	
Maticæ	1		
Quassia	132	16	
Rhei	21	44	Syrupus 6; Vinum 6.
Rosæ Acid	49		Syrupus 4.
Senegæ	118	40	
Sennæ	3	4	Syrupus 3; Confect. 11.
Serpentariæ	4	1	
Uvæ Ursi	2		
Valerianæ	1	11	Tinctura Ammon. 24.

For the sake of convenience we may roughly divide them into two groups—

- I. Those which yield an aromatic extractive.
- II. Those which yield a non-aromatic extractive.

In discussing them individually, three general tests may be laid down by which their claims to insertion in the new B.P. may be estimated, viz., the part they are expected to fulfil in the hands of the physician; the suitability of the menstruum for extracting what is required; and the frequency with which they are demanded, either by the physician or by the public. In connection with the last test, the following, excerpt from Martindale's 'Analysis of Twelve Thousand Prescriptions,' will be useful as a reference, and may fairly be taken as a standard. The other table shows how reduction of time affects the amount of extractive yielded by the infusions. In each case the maximum time mentioned is the B.P. time.

Table Showing Variations in Strength of Infusions.

	Grains of dry Extractive in one fluid ounce of Infusion after standing.		
	$\frac{1}{2}$ hour.	$\frac{1}{2}$ hour.	1 hour.
Buchu (<i>B. crenulata</i>)	5.5	6	
Caryophylli	3.5	4	
Cascarillæ	5	5.5	
Catechu	12	13.5	
Ergotæ	1.5	2	
Gentianæ Comp.	6	6	
Jaborandi	7	7	
Kramerie (bark)	2.5	3	
Lupuli	6	6.5	6.5
Matico	4	4	
Rhei	4.5	4.5	
Serpentariæ ..	2	2	
Uvae Ursi	8	8	8
Valerianæ	3	3	3

NOTE.—The shortening of the time made no difference in the colour or the aroma of the infusions, with the exception of gentian. It is referred to below.

AROMATIC GROUP.

Anthemidis.—The drug contains a bitter principle soluble in water and in alcohol, and also a volatile oil. This infusion, like many more of them, is a relic of the age when hot water was the only medium thought of in making a preparation of a herb. It is rarely required, and the use of hot water is objectionable on account of it volatilising a portion of the volatile oil which it is most desirable should be retained. For these reasons its retention can hardly be justified.

Aurantii.—If there is a desire that this one should be retained, the present formula is quite suitable. The fresh infusion has a nice aroma, but a very bitter taste, and will not keep under ordinary conditions for more than three or four days. If fifteen minims, an average dose, of the tincture be diluted to half an ounce with water and compared with the infusion, it will be found that the former has as good an aroma and wants the nauseously bitter taste. Apparently there is a larger proportion of the bitter principle, aurantiamarin—to which the tonic properties of the peel are attributed, present in the infusion than in the tincture. That, however, might be remedied by

altering the strength of the spirit, or the process of making the tincture. As they are at present, the infusion is likely the better tonic, and the tincture the better flavouring agent.

Aurantii Compositum.—It is not so frequently in demand as the simple infusion, and seems unnecessary, as the orange and lemon peels are both included in the formula for the compound infusion of gentian.

Buchu.—The time might well be reduced to fifteen minutes. As will be seen from the table there is only an extra half grain of extractive per fluid ounce in the half hour's infusion as compared with the fifteen minutes' infusion. The colour and aroma of the two are similar. The B.P. orders the leaves to be bruised, but in bruising, say, an ounce of the leaves in a mortar, a portion of them is reduced to a coarse powder before all of them can be said to be sufficiently bruised to meet the Pharmacopœia requirements, and the strength of the infusion may on that account slightly vary at times. Lucas, in a paper (*Ph. Jr.* [3], xxiv., 665) read last winter at an evening meeting in London, gave it as his opinion that it would be advantageous to omit the directions for bruising the leaves on account of them, at times, giving a mucilaginous infusion of such viscosity that it is almost impossible to strain it. The infusion mentioned in the table was made with *B. crenulata* leaves, but in order to test the matter more fully, samples of *B. betulina*, and *B. serratifolia* leaves were obtained and infusions made with each. To make the test as severe as possible, the leaves were in each case coarsely powdered instead of being merely bruised, but in neither case was there any difficulty in straining the infusion. *B. betulina* and *B. serratifolia* each gave 6½ grains of extractive per fluid ounce of infusion, *B. crenulata* 5½ grains. Of course leaves may vary somewhat with the conditions under which they are grown. In face of the contention, however, that a bland mucilaginous liquid is what the physicians desire, it seems the infusion may as well be omitted as to order it being made with unbruised leaves. An infusion made with unbruised *B. crenulata* leaves gave only 2½ grains of dry extractive per fluid ounce. The colour of the infusion was very pale, and to judge by the aroma it did not contain nearly so much of the volatile oil, which is only to be expected from the position of the oil glands in the leaf. Further, Lucas contended that the infusion made with unbruised leaves did not decompose as soon as that made with bruised leaves. The two infusions shown indicate the very contrary. Both were made five days ago, kept in bottles only partially filled, the corks of which were removed three or four times every day. The infusion of unbruised leaves has gone wrong already, whilst that of bruised leaves is quite satisfactory. Evidently the larger proportion of oil present has a preservative action. It is apparently a case of sacrificing utility for elegance. After a careful consideration of all the points it seems desirable that the infusion should be retained made with bruised leaves, and always made fresh as required.

Caryophylli.—The activity of cloves depends almost

entirely on the volatile oil. That being so, and the oil already official, an infusion seems unnecessary. It does not appear to be much in demand.

Cascarilla.—Here we have as active principles a volatile oil and a bitter principle, cascarillin. The latter is very sparingly soluble in water or alcohol. Its preparations are commonly used as aromatic and tonic adjuncts to other medicines. Considering these two facts together, it seems as if a strong alcoholic menstruum would be more likely than water to give a preparation more suitable in every way. Half a drachm of the tincture diluted to half an ounce with water has a much better aroma than the infusion. The taste is very much the same, both nauseously bitter. Even if it is retained the time might be reduced to fifteen minutes, as the aroma is quite as good, and there is only half a grain less of extractive in the fluid ounce.

Osparia is rarely used, and should be omitted.

Gentiana Compositum.—This is a very popular preparation, and deservedly so, a fifteen minutes' infusion gives the same amount of extractive as a half hour's. The only difference between the two infusions is that the lemon odour is slightly more apparent in the former than in the latter. The odour of the latter is more blended, but not finer. It is most desirable that this infusion should be retained and that it should always be freshly prepared. For fineness of aroma the concentrated preparation is not to be compared with the fresh. No doubt the concentrated preparation can be made to contain the proper amount of extractive and may be as good a tonic, but these are not the only points to be considered.

Lupuli.—This infusion may be classed amongst the seldom used, and it is a question for the committee as to whether it is worth retaining it, seeing there is a tincture official. From the table it will be seen that a fifteen minutes' infusion gives only half a grain less of extractive per fluid ounce than the half hour and one hour's infusions. The colour and aroma are similar in each case. As an argument against the infusion it may be noted that the active principles of hop are a volatile oil and lupulinic acid. The former is only sparingly soluble in water, the latter insoluble.

Rosa Acidum.—As this preparation is only used as a vehicle for other medicines, a fresh infusion is not really necessary; a fluid extract would meet all the requirements. The fresh infusion has a slightly better aroma, but is not nearly so elegant as a fluid extract prepared by repercolation.

Serpentaria.—This is another infusion seldom prescribed. Lucas, in the paper already alluded to, suggests that the drug should not be bruised, as some of the starch comes out when the infusion is made with the powder, and that is objectionable when the infusion is prescribed along with tincture of iodine, as it sometimes is. When made with the unbruised drug, however, it only yields half a grain of extractive per fluid ounce. On this account and also because its active principles are soluble in alcohol, either a fluid extract or a tincture is likely to prove a more satisfactory preparation.

Valeriana.—Likewise seldom used, and considered by physicians to be much inferior to the two tinctures. On these grounds it seems superfluous.

NON-AROMATIC GROUP.

Calumba.—This is a popular preparation, but it is very doubtful if a fresh infusion is in any way superior to the tincture or a fluid extract. The principal point is to prevent the starch being taken up by the menstruum. In a fluid extract prepared by repercolation, and no heat used at any stage of the process, the conditions of the active principles of the drug are not likely to be in any way different from what they would be in the fresh infusion. The quantity of spirit necessary to preserve it could not interfere with its utility.

Catechu.—In this drug the most important constituent is catechu-tannic acid, soluble in cold water. Of the other two important constituents quercitrin is sparingly soluble in water, and catechu is soluble in water, but more so in alcohol. It would naturally be concluded that an infusion would be as efficacious as the tincture, but medical authorities say that it is not so. It certainly is very seldom used, and its omission is not likely to be felt.

Chirata.—It has been argued by some that this infusion when made according to the B.P. directions is superior to the tincture, but the latter seems to be as popular amongst physicians. It is used in the same cases as gentian, to which it is closely allied in its medicinal properties, and as it is not so often required, one preparation of it seems sufficient.

Cinchona Acidum.—The principal arguments against this infusion are the great loss of alkaloids in making it, and the fact that there is an acid solution official which is always constant in strength. It has been shown by Thomson that there is a loss of 20.3 per cent. of total alkaloids and 52.63 per cent. of quinine and cinchonidine. Amongst pharmacists the foregoing is enough to justify the deletion of the present formula.

Cusco.—This has all along been a blot in the Pharmacopœia. Surely the blunder will not be repeated.

Digitalis.—Medical opinion differs a good deal regarding this preparation, but that does not come within the scope of this paper. There is one point in connection with it, however, that deserves a little notice, and that is the variation in the strength of it which some physicians complain so much about. The B.P. directions are for glove leaves, 28 grains; boiling water, 10 ounces. Now if a parcel of dried leaves been knocked about a good deal in transit, and in handling, some of the leaves will likely be broken up a good deal, and if these are used in making the infusion, the resulting liquid will be somewhat stronger than one made with entire leaves. This has been proved by experiment. An infusion made with entire leaves gave 1.16 grains of extractive per fluid ounce, whilst if the leaves were broken by gently rolling them between the hands the extractive amounted to 1.33 grains per fluid ounce. The difference is not great, but it must be remembered that we are dealing with a powerful drug. A. K. Stewart in a letter on infusions (*Ph. J.* [3], xxxii., 460) expressed the opinion that the leaves were not exhausted by fifteen minutes' infu-

sion, and advocated the time being extended to half an hour. There is no doubt about the leaves being only partially exhausted in fifteen minutes, but the same may be said of every infusion in the Pharmacopœia. Half an hour's infusion gave an extractive of 1·3 grains per fluid ounce, an increase of ·14 grains. Since by breaking the leaves into small pieces an equally strong infusion, so far as extractive is an indication, can be made, it would be a pity to extend the time, all the more so since it is held that the infusion should always be freshly prepared.

Ergotæ.—This is another of the seldom used class, and as an aqueous extract is already official and held in high esteem by physicians, it might be deleted.

Jaborandi.—In the case of a powerful drug like this, which requires to be used with such caution, it is a mistake to have a preparation which may vary somewhat, and as a standardised tincture will likely be omitted in the new B.P., the infusion ought to be omitted.

Krameria.—One objection to this infusion is that it soon decomposes, the rhatania-tannic acid being oxidised and rhatania-red deposited. The same takes place in the tincture, but in a less degree. Moreover, it is seldom used, and the tincture being retained would never be missed. It is to be hoped the bark alone will be made official in the new B.P.

Lini.—This is more a household remedy than a physician's, and might be omitted, as the amateur doctors do not take the B.P. as their guide in making it.

Maticoæ.—The infusion is the only official preparation of the drug, but according to therapeutists, as an internal remedy its properties are not well marked, and consequently it is rarely used. It is for the medicals to say if it should be retained. Pharmaceutically there is little to be said against it, except that a quarter of an hour's infusion would do quite as well as half an hour, the extractive being the same in each case.

Quassia.—Water is no doubt a good exhaustor of this drug, but it is difficult to perceive how a fresh infusion is superior to an aqueous fluid extract. The quantity of spirit necessary to preserve it can hardly be objected to. A fluid drachm of the concentrated preparation does not usually contain more than fifteen minims of rectified spirit, and when this is diluted to an ounce to form the infusion, the percentage of alcohol is very small. Even when it is used as an injection for thread worm, that proportion of alcohol would not be objectionable.

Rhei.—In view of the cry against redundancy this preparation, might be omitted, as the tincture serves all the purposes it does and is more stable. Hot water might be objected to on account of the presence of starch in the root. Fifteen minutes gives as good an infusion as half an hour.

Senega.—This is one of the few popular infusions, but it is a question if its popularity has been built up on the merits of the fresh infusion. The only objection to a fluid extract is that on keeping the senegin splits up into sapogenin. The same decom-

position takes place in the tincture, but no deposit is formed as the sapogenin is soluble in the spirit.

Senna.—Is rarely used except in making the official *mistura sennæ composita* and ought therefore to be included in the formula for it and not given separately.

Uva Ursi.—This is not often used, but as it is the only official preparation of the drug, and generally used in diseases where spirit is contra-indicated, it should remain. The time, however, might safely be reduced to fifteen minutes, as an hour's infusion does not yield any more extractive.

In conclusion I wish to express my thanks to Dr. Stockman for kindly answering several queries relating to the uses of some of the drugs mentioned.

PILLS.

BY J. I. FRASER.

The maximum size of pharmacopœial pills should not exceed 4 gra., and in all cases the excipient which makes the smallest pill is to be preferred. For this reason I would suggest that confection of roses should be deleted as an excipient, with the exception of its use in *pil. hydrargyri*.

As a general rule, syrup would prove the most efficient excipient, both as regards bulk and keeping properties.

It would be well if in every case a definite weight of powdered ingredients plus excipient were made into a definite number of pills, as in the United States and Continental pharmacopœias, and the number suitable for a dose given. I think it would be an advantage to have a short introductory note on the class *pilulæ* preceding that section in the Pharmacopœia. This note would give some general details as to the various coatings and other matters, and would serve as a general guide to prescribers and dispensers, so that we would not see one man sending out his pills adherent with licorice powder, another lycopodium, a third French chalk, and so on.

As most of those in the following list are seldom if ever used I think they should now be deleted:—

<i>Pil. aloes barb.</i>	<i>Pil. ferri carb.</i>
<i>Pil. aloes soc.</i>	<i>Pil. hydrarg. subchlor. co.</i>
<i>Pil. cambogiæ co.</i>	<i>Pil. scillæ co.</i>
<i>Pil. conii co.</i>	

Then the following formulæ might be improved:—

Pil. Aloes et Asafetidæ.—I would suggest that syrup would be a more suitable excipient.

Pil. Aloes et Ferri.—Is the amount of aromatic powder necessary in the preparation? The quantity seems absurd. In ordinary practice, doctors, in prescribing aloes and iron, do not order aromatic powder. If a carminative is necessary a minute quantity of the oleoresin of ginger, known as gingerine, might do.

Pil. Aloes et Myrrhæ.—Syrup is suitable for this. It might be worth while enquiring if the saffron plays any beneficial part.

Pil. Asafetidæ Co.—This perhaps is the most suitable method of making this pill.

Pil. Colocynth Co.—Water makes the best mass in this case.

Pil. Coloc. et Hyoscyami.—This also might remain as it is.

Pil. Ferri Iodidi.—This is an instance in which the number of pills should be distinctly stated. A note might be added that they should be varnished.

Pil. Hydrargyri.—This might be left as it is.

Pil. Ipecac. & Scilla.—Use syrup as an excipient.

Pil. Phosphori.—The present formula is unsatisfactory. The following I find answers well. A phosphorated suet is made by dissolving phosphorus in a sufficient quantity of bisulphide of carbon, and then incorporating with suet to make a 10 per cent. basis. Of this basis 10 grs. well beat up with 90 grs. of oil of theobroma, form a good pill mass, which could be divided into 30 or 50 pills, containing respectively 1/30 and 1/50 grs. phosphorus in each. This is practically a modification of Martindale's formula.

Pil. Plumbi. & Opio.—Syrup also for this.

Pil. Rhei Co.—The present excipient is universally condemned. Made with syrup 4 grs. are practically equivalent to 5 grs. of the present mass.

Pil. Saponis Co.—It is questionable if this ought to be retained; certainly the synonym *pil. opii* should be dropped.

Pil. Scammon. Co.—Is there any advantage in making a solution and evaporating? Gingerine would answer the same purpose as the tincture of ginger.

Pil. Ferri.—The water is usually unnecessary.

Regarding the adding of new formulæ; if frequency of usage is any criterion as to the pills which should be in the Pharmacopœia, one might suggest a simple opium pill containing one grain powdered opium in each. Also a podophyllin pill, which seems to be in very general demand.

Another containing calomel, combined with an aperient, might take the place of the present *pil. hydrarg. subchlor. co.*

EXTRACTS.

BY WILLIAM SWAN.

Extract. Aconiti.—This should be left out. If it was ever greatly in use it has now entirely lost its reputation, and is rarely prescribed. A standardised alcoholic extract of the root would be a distinct advance in the present preparation, but as the extract is not reputedly the best form in which to exhibit the drug, its elimination altogether is more desirable than its modification.

Extract. Belæ Liquid.—It would be difficult to find a justification for the inclusion of this now entirely disused preparation in a new Pharmacopœia. Its place has been taken by other and better remedies.

Extract. Calumbæ should also be left out, and also on the ground of disuse.

Extract. Belladonnæ.—From any point but that of physical consistency this is a most unsatisfactory extract because of its varying alkaloidal strength and of the difficulty of obtaining any but a very imperfect estimation. The anomaly of a preparation in extensive daily use containing a varying quantity of powerful alkaloid is now generally recognised, and various remedies have been suggested. Most of the recent writers incline to preparation from the root,

while all are agreed that standardisation is imperative. The introduction of a new class of preparations similar to the abstracts of the United States Pharmacopœia has been suggested as a sort of *via media*, but in a matter so important a straightforward endeavour to solve the difficulty would be more desirable than a compromise. The most satisfactory solution of the position would be to simply standardise the present alcoholic extract, and remove this one entirely.

Ext. Belladonnæ Alcoholic.—The use of a spirituous menstruum all through gives a stronger and more satisfactory preparation.

Ext. Rhamni Frangulæ and Rhamni Frangulæ Fluid.—Rhamnus bark was re-introduced into the British Pharmacopœia after a period of neglect. Since then valuable work has been done on the bark; but the introduction at the same time of cascara sagrada and its acknowledged superiority have conduced to its almost entire neglect. Its preparations, therefore, should not be in the Pharmacopœia.

Extract. Conii.—This preparation should, even if its disuse were not a sufficient justification for its elimination, be left out because of its very uncertain strength and of the difficulty in the way of a properly standardised preparation. Its use, however, is so limited that this of itself is sufficient.

Extract. Cascara Sagrada Liquid.—The formula and method of preparation of this extract must be altered; from the outset this has been only too obvious. The process is not only a very tedious but a very imperfect one, and experiment has shown that even after several more boilings than directed, the bark is not entirely exhausted. A much more satisfactory preparation is made by discarding the present method and substituting percolation, or extraction by pressure. Numerous suggestions have been made as to a suitable menstruum, and one which gives an extract of great strength and satisfaction is a mixture of rectified spirit and water, in the proportion of one of spirit and three of water. The formula for the preparation of this extract might read:—

Cascara sagrada (in coarse powder)..... 1lb.
Rectified spirit.....one part
Distilled water.....three parts } a sufficiency.

Moisten the bark with the menstruum and allow it to stand for twelve hours. Then transfer to a percolator till exhausted. Reserve the first fourteen ounces and evaporate the remainder by water bath to the consistency of a soft extract. Dissolve this in the reserved portion, make up to sixteen ounces with the menstruum, and filter.

Ext. Colocynth. Co.—The present directions are to evaporate to pilular consistency, but the invariable practice is to use it in the more convenient form of powder, and the pharmacopœial directions should be modified accordingly.

Ext. Ergotæ Liquid.—A much more satisfactory extract is made by a method in which a minimum of heat or none at all is used, and therefore the present process ought to be replaced by one of percolation or extraction by pressure. The best commercial makes are so prepared, and this in itself is conclusively sufficient authority against the present process.

Ext. Euonymi Siccum.—The chief objection to this is liability to become a solid mass in keeping. The natural cohesiveness of the resinous extract is evidently but little affected by the desiccant added, and magnesia has been suggested as a substitute for sugar of milk.

Ext. Glycyrrhizæ, Ext. Glycyrrhizæ Liq.—The best commercial extracts are made from the decorticated root, because of the more palatable nature of the product, and the Pharmacopœia should limit the root accordingly to the decorticated variety.

Ext. Nucis Vomica.—This preparation has fully sustained the favourable criticism received at its introduction, and has been carefully left alone. The suggestion has, however, been recently revived to add a liquid extract of standard strength for the preparation of the tincture. The suggestion has a much wider import than would appear at first sight. For what would such a liquid extract be but a concentrated tincture? And if you admit the value of a concentrated tincture in the case of *nux vomica*, it will be difficult to deny the advisability in the case of other and similar drugs. And, again, if you admit the value of concentrated spirituous preparations of such drugs, their concentrated aqueous preparations follow as a matter of course, so that finally you have a pharmacopœial recognition of concentrated preparations in general. But if the desirability of a liquid extract be granted, of what strength shall it be? A fairly concentrated preparation would not possess any advantage over the present solid extract, except that of being more readily soluble in the menstruum, and would be open to the same objection—the necessity of subjecting it to the action of heat. So that after all we are thrown back on a fluid extract of normal strength, or in other words a standardised tincture prepared direct from the seeds. This was the alternative at the time in the hands of the editors of the present Pharmacopœia, and as such a preparation is a better one than that at present in use, doubtless it will be substituted in the new British Pharmacopœia. With the above eliminations and modifications and the following additions the extracts of a new Pharmacopœia would fairly represent the requirements of the present day:—*Extractum bynes*, *extractum bynes liquidum*, *extractum convallariæ liquidum*, *extractum euonymi liquidum*, *extractum grindeliæ liquidum*, *extractum salicis liquidum*, and *extractum viburni prunifolii*.

(To be continued.)

SCHOOL OF PHARMACY PRIZE EXAMINATION QUESTIONS.

Fifty-third Session—Winter Course.

PRACTICAL CHEMISTRY.

PROFESSOR ATTFIELD.

March 27.—10 a.m. to 1 p.m., and 2 to 5 p.m.

Books and Memoranda permitted.

1. Is there any ferric salt in the "Solution of errors Sulphate"?
2. Name the substance "A."
3. Name the substance "B."
4. Analyse the fluid "C," stating its name.

5. What is the composition of the metal "D"?
6. Find out the nature of the acid "E." Is it pure?

NOTES.

Manipulation as well as results will be scrutinised.

While avoiding hurry economise time, and report results as soon as they are all obtained.

PHARMACY.

MR. INCE.

Thursday, March 28.—2 to 5 p.m.

[Four questions only to be attempted.]

1. Describe distillation, and illustrate the application of the process by reference to *Spiritus Ammonia Aromaticus*; *Spiritus Armoracæ*, and *Syrupus Papeveris*.
 2. Note the best methods of forming *Argentum Nitratum*, *Potassium Permanganate*, *Pepsinum* and explosive compounds into a pillular consistence.
 3. Mention some methods employed in comminuting *Camphora*, *Hydrargyrum*, *Iris rhizoma*, *Phosphorus* and *Sodium sulphas*.
 4. Show that one fluid ounce of *Tinctura Nucis Vomicae* contains one grain of the alkaloids of *Nux Vomica*.
 5. Give reasons for adopting the official formula *Extractum Sarsae Liquidum*.
 6. Write technical Latin for an eye-lotion, a mouth-wash, and a spray.
- Translate: [*Acidum Benzoicum*] *Sint crystalli albi, splendoris sericei, odoris grati.*

MATERIA MEDICA.

PROFESSOR HENRY G. GREENISH.

Friday, March 29.—2 to 5 p.m.

[Four questions only to be attempted.]

1. Write a short, concise account of *Kousso* and of *Rhatany root*; include diagnostic characters, mention possible substitutes, and indicate how these may be detected by the characters you give.
2. What is "Goa Powder"? Indicate its botanical and geographical sources. Describe its formation, collection, and composition. By what means would you endeavour to assay it?
3. What do you understand by resins of physiological and pathological origin? To which class (i.e., physiological or pathological) would you refer the following drugs:—*Aloes*, *Canada balsam*, *Peruvian balsam*, *Myrrh*, *Balsam of copaiba*, *Ammoniacum*. State your reason.
4. Compare *quillaja*, *elm*, and *slippery elm barks*. Point out their morphological nature, diagnostic characters, and chief constituents. Refer them to their botanical and geographical sources.
5. Describe the plant which yields *Euphorbium*. Indicate the geographical source of the drug. In what part of the plant and in what tissue is it secreted? Describe its collection, appearance, and constituents. Mention impurities it may contain.
6. What is the morphological nature of *Lycopodium*, *juniper berries*, *ergot*, *kola wormseed*, *jalap*, *barley* and *calendula*?

MAJOR EXAMINATION QUESTIONS.

April 1, 1895.

CHEMISTRY.

Time allowed.—10 a.m. to 1 p.m.

[Six Questions only to be attempted.]

1. Supposing a new element to be discovered, describe what steps would have to be taken in order to determine its atomic weight.

2. Give a full account of the present state of our knowledge concerning the circulation of nitrogen in nature.

3. Discuss the relations which arsenic and antimony exhibit towards the non-metallic and metallic elements respectively, and indicate how these are connected with their position in Mendelejeff's classification.

4. What is the constitution usually assigned to uric acid, and upon what evidence is it based?

5. How are nitro-compounds obtained in the paraffin and benzene series respectively? Mention some of the principal reactions into which these substances enter.

6. Give an account of the chemical relationship of cane-sugar, milk-sugar, grape-sugar, and maltose. What is glucosazone?

7. What is caffeine, how is it obtained in a pure state from natural sources, and how can it be artificially prepared from theobromine?

8. Describe some of the more important reactions of benzaldehyde which are not exhibited by fatty aldehydes.

9. Describe in detail the methods that you have adopted in preparing any two chemical compounds, inorganic or organic. By what means did you ascertain the purity of the substances so prepared?

PHYSICS.

Time allowed.—2 to 5 p.m.

[Six questions only to be attempted.]

1. If you look down into a vessel of water, does it appear to be of the same depth as when empty? If not, what is the explanation?

2. Explain the phenomenon of refraction by the undulatory theory of light.

3. What is dialysis? By means of it can any substances usually insoluble in water be obtained in aqueous solution?

4. Describe the construction of the Leyden jar. What takes place during its charge and discharge?

5. Describe what happens when the same electric current is simultaneously passed through vessels containing respectively dilute sulphuric acid, a solution of stannous chloride, a solution of sulphate of copper, and a solution of nitrate of lead.

6. What conditions affect the fusing points of solids and the boiling points of liquids? How are fusing and boiling points determined?

7. If into a kilogramme of water at 0° a current of steam is passed until the quantity of water is 1010 grammes, what will be the temperature of the liquid?

8. If a gas is measured over mercury in an ordinary gas analysis, what observations and corrections are necessary?

9. Describe carefully how you would determine the focal length of a concave lens.

Tuesday, April 2.

BOTANY AND MATERIA MEDICA.

A paper.*

Time allowed.—10 a.m. to 1 p.m.

1. Describe the structure of the seed of a typical Monocotyledonous plant. What are the substances which occur as reserve materials in the one you select? How are these utilised by the young plant in the process of germination?

2. What is chlorophyll? Give some account of its manner of occurrence in plants, its properties and functions, and the conditions necessary for the discharge of the latter.

3. Give an account of the way in which the mature cells of the wood are developed from the cambium.

4. What part of the plant *Hydrastis Canadensis* is used in medicine? How would you recognise the botanical nature of a specimen of the drug as met with in commerce? Give an account of the medicinal constituent or constituents.

5. What are the sources of Pilocarpin? How would you recognise them in the unaltered form and in powder? Describe the active principle as usually prepared. What other alkaloids occur in the same parts of the plants?

PRACTICAL BOTANY AND MATERIA MEDICA.

B Paper.*

Time allowed.—10 a.m. to 1 p.m.

1. Identify the leaves supplied to you, calling attention to their distinctive microscopical and histological characters. Make such a microscopical preparation as will enable you to point out the latter, and leave it with a lettered explanatory sketch for inspection by the examiners.

2. Make transverse and longitudinal sections of the tissue supplied to you, to display to the best advantage the structure of laticiferous vessels.

3. Describe the flower provided, and refer it to its Natural Order, giving the reasons for your assignment.

PRACTICAL BOTANY AND MATERIA MEDICA.

A Paper.*

Time allowed.—2 to 5 p.m.

1. Identify the leaves supplied to you, calling attention to their distinctive microscopical and histological characters. Make such a microscopical preparation as will enable you to point out the latter, and leave it with a lettered explanatory sketch for inspection by the examiners.

2. Make transverse and longitudinal sections of the tissue supplied to you, to display to the best advantage the structure of sieve tubes.

3. Describe the flower provided, and refer it to its Natural Order, giving the reasons for your assignment.

* Part of the candidates received the papers A, A, and the remainder had the papers B, B.

BOTANY AND MATERIA MEDICA.

B Paper.*

Time allowed—2 to 5 p.m.

1. Describe the structure of a mature ovule of a Gymnospermous plant, and point out what part of it, if any, may be described as a *prothallus*.

2. Give some account of the arrangement of the fibro-vascular tissue in a young seedling of a Dicotyledonous plant, pointing out the differences between stem and root in this respect.

3. Describe the structure of a mature *anther* and the method of development of the pollen grains in a Phanerogam. What structures in a Fern are homologous with the pollen grains and embryo-sac of a Phanerogam?

4. Describe the plant from which opium is prepared. In what part of it is the drug situated? What are the chief alkaloidal products yielded by crude opium? How does the quantity of any of them vary with the age of the plant?

5. Give some account of the chief poisonous Umbelliferous plants that occur in Great Britain, laying stress on those points by which you would identify them while growing.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Thursday, the 4th inst., the Librarian and Curator presented the following reports of donations to the Society's Library, Museum, and Herbarium:—

To the Library (London).

Smithsonian Institution, Washington:
Smithsonian Report for 1893.

King's College Hospital, London:
Reports, vol. 1, 1895.

Society of Arts, London:
Index to Journal, vols. 31-40.

Dr. B. Kobert, Dorpat:
Ueber den Kwass.

Mr. J. E. Geroch, Strassburg-Neudorf:
Zur Erinnerung an F. A. Flückiger, 1895.

To the Museum (London).

Mr. L. Wray, jun., Larut, Perak:
Large sample of "Pruai" root.
Roots of *Dianella ensifolia*.
Culilawan bark.
"Getah Lulay" and varnish prepared from it.
Malay Hair Oil prepared from cocoa nut oil and
"Pandanus" flowers.

Mr. J. G. Prebble, Bombay:
False Pellitory root, imported from Marseilles.

Sir F. von Mueller, K.C.M.G., Melbourne:
Kino from *Eucalyptus calophylla*.

Mr. G. F. Scott Elliot, M.A., B.Sc., etc.
"Mutiru" root and "Muavi" and "Ogolo" barks
from Uganda.

To the Herbarium (London).

Mr. L. Wray, jun., Larut, Perak:
Specimens of *Dianella ensifolia*, *Garcinia species*,
Mitragyna speciosa, and the plant yielding
"Pruai" root.

* Part of the candidates received the papers A, A, and the remainder had the papers B, B.

Mr. J. H. Maiden, Technological Museum, Sydney:
Seeds of *Araucaria bidwillii* and Fruits of *Hicks-
beackia pinnatifolia*.

To the Museum (Edinburgh).

Messrs. Hodgkinson, Treacher, and Clark:
Specimen of False Chirata (*Andrographis panicu-
lata*).

Proceedings of Societies in London.

ROYAL INSTITUTION.

At the evening meeting on the 29th ult., a lecture was delivered on—

THE STRUCTURE OF THE SUGARS AND THEIR
ARTIFICIAL PRODUCTION.

BY PROFESSOR H. E. ARMSTRONG, F.R.S.

At the outset, the lecturer alluded to the way in which organic chemistry had of late been neglected at the Royal Institution, and commented upon the methods followed in this branch of science. Incidentally it was said, that although the mathematical training received at school was of great assistance subsequently in scientific work, yet the chemistry there learnt was no use as a basis for future investigation. Professor Armstrong's remarks were mostly confined to the researches in the sugar group conducted by Professor Emil Fischer and his assistants, which were characterised as being infinitely more important than the majority of work done in other branches of chemistry. Some statistics were first given of the production of sugar, and its relative consumption in Great Britain and other countries, allusion being made to the way in which beet has now replaced cane sugar, only a small amount of that used at the present time coming from the latter source.

The structure of the most important members of the sugar group, especially glucose, fructose, maltose and lactose, was described minutely, and the various properties illustrated by the aid of experiments. The latter for the most part illustrated their relative reducing effect upon alkaline copper sulphate solution. The optical properties of the sugars were fully described, and in discussing the symmetrical and asymmetrical carbonates, Pasteur's work on the various modifications of tartaric acid was noticed. It was demonstrated that the most important reagent for the study of the sugars is phenylhydrazine $C_6H_5NH.NH_2$. As a typical experiment, solution of glucose was mixed with phenylhydrazine acetate solution. As a first stage of the reaction the crystalline compound phenylhydrazone is formed, which contains the hydrazone residue; on heating, more phenylhydrazine enters into the reaction, and the compound phenylosazone is formed. These two compounds, which are typical of the class, are both crystalline substances of definite melting point, and from any hydrazone or osazone the sugar used to form it can be regenerated.

SCHOOL OF PHARMACY STUDENTS'
ASSOCIATION.

A meeting was held on Thursday, March 28, Mr. H. T. Durant, Vice-President, in the chair. The business commenced with a series of dispensing notes, and examples of incompatible or remarkable prescriptions

communicated by Messrs. Tickle, Read, Davis, Hill, Brown, Stoddart, Jealous, Dyson, and Durrant, which were discussed and commented on.

Mr. H. Brown then took the chair, and a report on inorganic chemistry was read by Mr. A. T. Hill. The report gave rise to a discussion in which the Chairman, Messrs. Durrant, Read, Tickle, and the Secretary took part.

It was unanimously resolved that the Executive Committee should be instructed to make arrangements, as in previous years, for botanical excursions on Saturday afternoons.

The meeting then adjourned.

CHEMISTS' ASSISTANTS' ASSOCIATION.

There was an average attendance at the meeting of this Association on the 28th ult., when the evening was devoted to short papers and discussions. The President, Mr. R. H. Jones, occupied the chair, and, after the reading of the minutes, called on Mr. W. A. Jones to read his paper, entitled:—

A FEW NOTES ON THE COMING REVISION OF THE BRITISH PHARMACOPOEIA, FROM A DISPENSER'S POINT OF VIEW.

BY W. A. JONES.

The author commented upon the inferior style in which the Pharmacopoeia is at present bound and the bad quality of the paper, and then went on to advocate the introduction of several new preparations and classes of remedies. He was of opinion that urethral bougies, 20 grain size, should be introduced, with such combinations as belladonna, carbonate of bismuth, cocaine, tannin, and lead acetate. The fluid extracts should be considerably increased by the addition of preparations of belladonna, calumba, digitalis, hyoscyamus, nux vomica, and rhubarb; and he was in favour of the process given in the U.S.P. for those preparations, which gave very satisfactory results. As an instance of the unsatisfactory processes for fluid extracts at present official, he cited taraxacum, in which at the commencement a menstruum of proof spirit was used, but finally exhaustion was completed with water. On mixing these two liquids a deposit of mucilaginous matter resulted which was difficult to filter off. On the other hand, in the U.S.P. the same menstruum was used throughout.

With regard to the alcohols, a modification of the plan used in the French Codex was recommended, by which any strength of spirit could be ordered by affixing the number of degrees in Syke's hydrometer it should correspond to, as there were many cases in which it was not advisable to be restricted to the use of proof or rectified spirit extract. Ext. cinchonæ liquid, should have characters and tests appended, and a specific gravity should be given. Concentrated infusions and decoctions should be recognised officially, in addition to those at present included. They were extensively used, and were sometimes specially ordered by the profession, and it was advisable that some standard should be fixed for them. An injection of morphine and atropine should be introduced, and as camphor water had been shown to be of little or no use as a preservative of this class of preparations.

carbolic acid was perhaps preferable. The injection of ergotin was variable in strength, by reason of the directions for preparing ergotin itself being indefinite. It was preferable to use pure morphine for the injection instead of its salt, and attention was drawn to the fact that the present strength was really practically identical with that of the B.P. of 1867, owing to the difference in the two morphine formulae. If morphine alkaloid were introduced a test providing for loss of weight and drying was necessary. Turning to the percentage solutions, Mr. Jones advocated the abolition of the grain measure, and instead of having the strength of this class of preparations 1 grain in 100 fluid grains, would either revert to the old plan of 4 grains to the fluid ounce, or 1 grain in 100 minims. The directions for liq. strychnin. hydrochlor. should be altered so as to ensure a definite finished volume.

A solution of nitrite of ethyl should be introduced, and additions to the oleates made by those of bismuth and copper. The official list of suppositories should be increased and formulae introduced for Easton's Syrup, compound syrup of the hypophosphites, and Parrish's Syrup. The want of consistency in the directions for ointment making was noticed. Thus, we are told to "rub till perfectly smooth and free from grittiness" in the case of sulphurated potash ointment, but only to "mix thoroughly" in ammoniated mercury ointment, although the latter is equally difficult to turn out satisfactorily.

A paper was then read on—

THE INTRODUCTION OF THE METRIC SYSTEM INTO THE BRITISH PHARMACOPOEIA.

BY W. ANDERSON.

In this the author advocated the adoption of this system of weights and measures only in the next Pharmacopoeia. He did not think the two standards could work side by side, as confusion would only result. He was of opinion that it was the most scientific and nearest approach to a perfect system yet put forward, and that its use would lead to a large increase in our export trade. He was glad to see it had many influential supporters, and trusted the new B.P. would see it adopted solely.

In the discussion that followed, Mr. Dyson was of opinion that the B.P. should be cut down, and a wholesale abolition of obsolete preparations carried out. With regard to Mr. Jones' remark on the official ointments, he thought the pharmacist should need no particular directions in such instances as those quoted. He did not think the metric system well adapted for dispensing purposes in this country.

Mr. Taylor was in favour of the deletion of most of the confections, and alluded to the growing absurdity of physicians prescribing nostrums, which he attributed to their inability to write a prescription properly.

Mr. Guyer hoped that before Easton's Syrup was made official, a satisfactory formula would be discovered, as it was still a desideratum.

Mr. Melhuish put in a word for the retention of the

soap basis for some suppositories, and denounced the proposal to introduce therapeutics into the national medicine book.

The President, in complimenting Mr. Jones upon his paper, pointed out a few misapprehensions which previous speakers had been under as to the introduction of concentrated infusions and decoctions. Mr. Jones merely suggested their recognition, not that they should supplant those in use now. He thought that a series of oleates prepared by double decomposition should be introduced. Solution of ethylnitrite should not be recognised until its therapeutic advantages were definitely established. As to ointment bases, good lard was hard to beat for general purposes, and he hoped that lanolin would meet with further recognition. Although in favour of the introduction of the metric system into the Pharmacopœia, he did not advocate its appearance in the Minor schedule at present.

Messrs. Hill, Morley, Roberts, and others joined in the discussion, and Messrs. Jones and Anderson having briefly replied to various points raised, the rest of the evening was devoted to dispensing queries. In the first of these Mr. E. W. Hill mentioned a prescription he had dispensed for sodium nitrite in pills. With ordinary excipients red fumes were evolved and the pills attained abnormal sizes, but by using kaolin ointment the difficulty was overcome. Mr. W. Anderson then mentioned that when preparing compound syrup of hypophosphites recently it was noticed that H_2S gas was evolved. It was the general opinion that it was due to the presence of ultramarine in the sugar used, which, on being decomposed by the acids, gave rise to the H_2S gas. Mr. C. Morley opened a discussion as to the best course to adopt when cocaine hydrochlorate was ordered in an ointment or suppository. It will be remembered that this point was referred to recently in the "Notes and Queries" column of the *Pharmaceutical Journal* (*ante*, p. 539). Messrs. Taylor, Dyson, Bainbridge, Roberts, and the President assisted to elucidate this with various suggestions. It was generally agreed that if it were permissible to use the alkaloid in an ointment, the best plan was to neutralise it with oleic acid and mix with the basis in the ordinary way. If, however, the use of the salt was compulsory, as it is only slightly soluble in fats, the best plan seems to be to rub it down to a very fine powder, then add a drop or two of water and mix with the basis gradually.

Mr. E. H. Hill had had the following mixture to dispense:—

Bromoform	℥i.
Water to	℥viii.

He had found the best plan was to emulsify it with tincture of quillaja, four drachms being sufficient for the above quantity of bromoform. Mr. Bainbridge stated that equal parts of bromoform and tincture of senega gave a very presentable mixture.

In the last note Mr. C. Morley recommended the use of graphite in the form of ordinary plumbago as a coating for the pharmacopœial Bland's pills. He had got good results by its use, as the pills did not readily oxidise or become "pitted."

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

A meeting was held at the Royal Institution on Thursday, March 28, Mr. J. Smith, President, in the chair.

The President remarked that in the latest edition of the U.S.P. the use of phosphate of calcium is ordered in the preparation of some of the aromatic waters, and knowing that the method has been recommended in this country, thought it worth mentioning that while a water of fine aroma can be obtained, the process has a serious disadvantage in the partial solubility of the calcium phosphate. An aromatic water so prepared is incompatible with ammonium carbonate or other substances which react with a phosphate or a calcium salt.

Mr. A. C. Abraham said the solubility of phosphate of calcium had been mentioned before, and the use of it objected to on that account. Personally, he did not see any necessity for using any powder whatever.

Mr. C. J. S. Thompson also referred to the subject of aromatic waters, and thought that in the next pharmacopœia it would be advisable to have a process by which the waters prepared with essential oils could be conveniently prepared by the average working pharmacist without distillation.

Mr. Edward Davies, gave an abstract of an address he had given before the Liverpool science students, the subject selected for him having been the "Centenary of Lavoisier."

The following paper was then read:

THE PHARMACOPOEIA REVISION.

BY C. SYMES, PH.D.

When it was decided that the London, Edinburgh, and Dublin pharmacopœias should be consolidated into a British Pharmacopœia, considerable interest was evinced on the matter. The same appears to be the case now that it is proposed to make that pharmacopœia what it should have been, viz., an imperial one embracing the pharmacy of our colonies. Suddenly it seems to have become the duty of certain persons to make themselves acquainted with, to criticise, and to denounce the work which we have hitherto regarded with entirely different feelings. The medical critics start with the assumption that the Pharmacopœia exists chiefly, if not exclusively, for the benefit of their profession, and, judged from that point of view, they pronounce it a failure because it contains many drugs and preparations with which the said critics are not familiar, and because it does not contain those little formulae for combinations of drugs put up in a ready-made fashion nowadays. Under this first head they proceed to apply the pruning knife most vigorously, and under the second they suggest that this book should "contain tablets" and some therapeutics.

The pharmaceutical critics regard the work as being of equal importance to their own calling, and from their positions as dispensers of medicine they are able to judge of the wants of a very large number of medical men, as well as of their own. They are thus enabled to bring forward views to bear on the subject,

and to exercise what appears to me more just criticism. It is the more general knowledge required, as well as the important interests to be conserved, which, to my mind, justifies the pharmacist in claiming a full representation on the pharmacopœia committee. I have said that the additional interest attached to the present revision is due to the proposal to make it embrace the pharmaceutical interests of our colonies. This, however, is really not new. In the preface of the B.P., 1867, it is stated that the work is produced in compliance with the Act of Parliament, 25 and 26 Victoria, and that it is intended to afford to the members of the medical profession and those engaged in the preparation of medicines throughout the British Empire one uniform standard and guide. Now, if the British Empire means anything, it means not only Great Britain and Ireland, but also our colonies. What is meant, then, is that this object should be carried out more completely than has hitherto been done, by adding such remedies as are in use and have a well-established reputation in colonies although not in general use in this country. This is the intended and proper scope of the work, its nature being defined in the Med. Act of 1858, where it is enacted that the "General Council shall cause to be published under their direction a book containing a list of medicines and compounds and the manner of preparing them, together with the true weights and measures by which they are to be prepared and mixed, and containing such other matters and things relating thereto as the General Council shall think fit." Clearly, then, it is the province of the medical faculty to decide what the book shall contain, but in arriving at the conclusion as regards the drugs and preparations, considerable help could be afforded by the pharmacist. The analysis of 10,000 prescriptions published by Mr. Martindale ought to be of service in this way, and would certainly have been largely so had it covered a wider area. If it is desired on the part of the medical profession to have "other matters" relating to the drugs and preparations embodied in the work, it is quite competent for the General Council to do such, and although we might not approve of extending the matter to therapeutics, it would not be our duty to offer any protest.

Broadly, I would say more mischief is likely to arise from curtailing the materia medica than from retaining or adding something which may appear to be superfluous. Take, for example, "menthol plaster." I could never understand why that was included in the work, as in my experience the demand for it is exceedingly small; but if in some localities it is occasionally used, a formula for it is desirable, and I am perfectly content that it should remain. The cataplasma are not often prepared by the pharmacist, it is true, but they are occasionally so, and they are at least good formulæ which the medical man can recommend to his patients. The enemata are frequently prepared though not so often dispensed in a pharmacy, and yet the formulæ are very useful to the medical practitioner. Why should either be removed? We are told that it is superfluous to have several preparations such as tincture, infusion, and extract of

any one drug; but this statement cannot be sustained by reasonable argument, it is merely theory. It is stated that the standards of quality are too low, that the tests for purity are not sufficiently exacting, and that there is a want of uniformity in the strength of the various preparations. Persons who work in this way seem to ignore the existence of the Food and Drugs Act, and the fact that scientific accuracy in pharmacology is decidedly in advance of that in therapeutics, and they are willing to sacrifice practical utility to appearances.

In my opinion the Pharmacopœia aims at being thoroughly practical, rather than theoretical. When published it was quite up to date and as much ahead of the times as any similar work of the period. It, like all other books, contained a few errors, and no doubt note has already been made of these in preparing for the new edition. For example, we shall have goa powder or araroba mentioned as the source of chrysarobin (commonly called chrysophanic acid), instead of being mixed up with it in a way calculated to mislead. The formulæ for either the solid or liquid extract of cascara will doubtless be modified, as both cannot be correct.

The hypodermic injections of ergotin and morphine would be better if less concentrated—there would be greater accuracy in their administration and less local irritation would be caused by their use. The latter has been made more concentrated merely to comply with decimal proportions, making it far more difficult for the medical practitioner to administer accurately $\frac{1}{6}$ or $\frac{1}{4}$ grain. Further, as the strength of the other two preparations of this kind bear no similar decimal relation, what avails it in this case? The two essences of aniseed and pepper mint are also much too concentrated; 1 in 8 or 1 in 10 would make a much better essence for dispensing purposes, and would correspond with the articles for many years sold to the public and to which they have become accustomed. Essence or strong tincture of ginger has on the other hand been reduced in strength from the popular article, 1 lb. to the pint, and why? simply to make the proportion 1 in 10; but as 10 oz. of spirit do not weigh 10 oz. the object is frustrated. It may suit the purpose of the student who wants to cram to have more decimal strengths irrespective of convenience of dose and manufacture, but is it worth doing? Much as I admire the decimal system for purely scientific purposes I do not think it is practical in a pharmacopœia in the present days. I think the doses should be retained, most certainly they are useful to prescriber and dispenser. Whether any other matter of a similar nature should be added to make the book more popular with the medical profession must rest with the Medical Council.

The President, in inviting discussion upon the subject of Dr. Symes' remarks, thought that, in the opinion of medical men, pharmacists had been too ready to offer suggestions and to criticise when it was known that a new edition of the Pharmacopœia was in contemplation. Pharmacists make no claim to decide

what new preparations shall be added or obsolete ones removed, but they do claim to have a voice in the methods and processes by which preparations are made. The Pharmacopœia as it stands is largely the work of pharmacists, and the recommendations contained in the annual reports of the editor, Dr. Attfield, from which the bulk of the information which will guide the pharmacopœia committee will be derived, have to a very large extent been culled from the published reports of meetings of pharmacists. It is not unreasonable, therefore, that pharmacists should claim to be openly recognised where they actually supply so large a portion of available information.

Messrs. A. C. Abraham, Cowley, Hornblower, C. J. S. Thompson, and others continued the discussion on the general question of pharmacopœia revision, and Dr. Symes replied to questions put to him in the discussion.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

At the meeting held on Friday, March 29, the following papers were read:—

BELLADONNA PLASTER.

BY PETER BOA.

This plaster is of considerable importance. Of the official plasters it is one of those most frequently used. The formula for it, which is now in the Pharmacopœia, gives rise to two objections, viz., that the plaster is too soft and runs, and that it is wanting in adhesiveness. The softness is caused by the large proportion of extract which it contains. Considering the potency of alcoholic extract of belladonna, it is worth while inquiring if it be really necessary that it should contain so much. The medicinal effect of the plaster is presumably due to a certain amount of absorption of the alkaloidal contents of belladonna, and looking at the matter in this light we find that its "possibilities" are startling. If we take, for illustration, a plaster 7 × 6 inches—the size of a 2 oz. paper—and allow the usual quantity of 20 grains to a square inch, 840 grains are required; of this one-fifth, 168 grains, is alcoholic extract, of which the maximum dose is $\frac{1}{4}$ grain.

Assuming that one-fourth of the spread plaster is in contact with the skin of the body, it is apparent that one hundred and sixty-eight maximum doses are presented for absorption.

Plasters are ordered in various sizes, some are smaller than the one I have taken for illustration, but many are larger. It appears to me therefore that the quantity of extract in the plaster is extravagant, I might almost say reckless. The ointment contains only 1 in 10. I would suggest that 1 in 10 is quite a sufficient strength for the plaster. An increase in

adhesiveness may be conferred by altering the formula to contain more resin, e.g.:—

Resin.....	5 parts.
Curd soap.....	2 "
Lead plaster.....	11 "
Alcoholic extract of belladonna ...	2 "

SUGGESTED B.P. EMULSIONS.

BY CLAUDE F. HENRY.

The present-day demand for elegant pharmacy and agreeable medicine warrants, at least, the consideration of the claim of emulsions to a place in the next pharmacopœia. The object of the present note is to suggest a few formulæ for the emulsions most frequently in request. Speaking generally, a creamy emulsion is to be preferred to a paste, and as to flavour, those I have suggested are what are personally agreeable to myself; but tastes differ, and these can be changed. Gum acacia has been adopted as the emulsifying agent, because of its being ready for use sooner than tragacanth, ghatti, Irish moss, etc., and requiring less preparation.

The following is the suggested formula for emulsion olei morrhue:—

Take of—

Gum acacia	1 ounce.
Cod liver oil	4 ounces.
Elixir of saccharin	40 minims.
Oil of cassia	2 minims.
Hypophosphite of soda	16 grains.
Hypophosphite of lime	16 grains.
Distilled water, q.s. to make	8 fluid ounces.

Make a mucilage by dissolving the gum acacia in two ounces of the water. To this gradually add two ounces of cod-liver oil, stirring constantly until a thick emulsion is formed, then add two ounces more water, in which the hypophosphites have previously been dissolved, and stir in as before the remainder of the oil. Add next the saccharin elixir and the oil of cassia, mix thoroughly, and make up to eight fluid ounces with distilled water. A 50 per cent. white creamy emulsion is thus produced. 75 per cent. of oil can easily be incorporated, but such an emulsion requires more flavouring, and is not so well tolerated by the stomach.

In preparing the emulsion the whole gum, which can be broken up in a mortar to facilitate solution, should be used in preference to the powder, and the mucilage should be prepared fresh when required, the tendency to acidity being thus prevented. The formula would necessitate the inclusion of elixir of saccharin and oil of cassia in the B.P. The forme is a very useful preparation, and that suggested by the B.P.C. unofficial formula committee should be chosen. The emulsion olei morrhue of the B.P.C. is not so good as the above. Its sickly colour is an objection, and eggs are not well suited for pharmaceutical manipulation even when they can be obtained fresh. A satisfactory castor oil emulsion is also, I think, a B.P. want. The mistura olei ricini of the present B.P. is, I think, objectionable, because of its being prepared with liquor potassæ, and because of the quantity directed to be used, the maximum dose, 60 drops, being required for each six drachms of oil;

of course this may not do much harm in the form in which it is taken, but it is an emulsion that is wanted, not a soap.

From the following formula a perfect emulsion can be made containing 50 per cent. of oil:—

Take of—

Gum acacia	$\frac{1}{2}$ ounce.
Castor oil	1 "
Elixir of saccharin	20 minima.
Oil of almonds	2 "
Oil of cloves	3 "
Distilled water, <i>q.s.</i> to make	2 fluid ounces.

Malt and cod-liver oil is now frequently prescribed, and a good thick emulsion can be made from this formula:—

Take of—

Gum acacia	1 ounce.
Cod-liver oil	4 ounces.
Liquid malt extract	4 "

Mix the malt extract with the gum acacia, let the mixture stand for four hours, then gradually stir in the cod-liver oil. No flavouring is required, but a few drops of saccharin elixir may be added. A more liquid preparation may be made by dissolving the gum in two ounces of water, adding one ounce of liquid malt extract, and stirring in slowly one ounce of cod-liver oil.

The only other emulsion in much demand is cod-liver oil with eucalyptus, which might be termed emulsio eucalypti co., or emulsio olei morrhue cum eucalypto, or cremor. eucalypti co. From the following formula a satisfactory preparation can be made:—

Take of—

Gum acacia	$\frac{3}{4}$ ounces.
Cod-liver oil	4 ounces.
Oil of eucalyptus	2 drachms.
Elixir of saccharin	1 drachm.
Oil of castile	2 drops.
Distilled water, <i>q.s.</i> to make	8 fluid ounces.

Prepare in the same way as cod-liver oil emulsion, adding the eucalyptus oil after the cod-liver oil. The flavouring may be left out entirely, in fact, there is a danger of over-flavouring emulsions with the idea of making them very palatable; but disagreeable eructations are apt to occur after swallowing too highly flavoured preparations. In closing this fragmentary note, I should like to say that some of the formulae given are not quite suitable for stock preparations. They are merely suggestions for B.P. preparations, which, when prescribed, pharmacists can make up fresh, as ought always, in these instances, to be done.

The reading of the papers was followed by a discussion, taken part in by Messrs. Boa, Cowie, Dey, Duncan, Hay, Henry, Hill, McEwan, and Sinclair, and on the motion of the Chairman, a cordial vote of thanks was awarded to the authors.

Messrs. Sinclair and Thwaites were appointed Auditors, and the meeting then closed.

Correspondence.

THE MAJOR EXAMINATION.

Sir,—Having been asked for my views respecting the division of the Major examination into two or more parts, I have ascertained the opinions both of present students in college and past pupils who are in business on their own account, and from the replies received, I am confident that such a change would not only be welcomed by students generally, but would greatly benefit our Society by increasing the number of Major candidates, and as a result considerably augment the number of members of the Society. On going through the list of Westminster men in business as chemists and druggists (numbering over 700), I regret to find that only about 23 per cent. of these are connected with the Pharmaceutical Society as associates, while over 90 per cent. of those who have passed the Major examination have become members. This fact is alone, I think, sufficient proof of the advisability of, in some way or other, encouraging young men to continue their studies for the Major. On an average not more than 6 per cent. of our men can be induced to pursue their studies after passing the Minor. To thoroughly prepare for the Minor under the present regulations necessitates a great strain both on the mental powers and financial resources of the students. I feel persuaded that if the Major examination were divided into two portions only, practical and theoretical (though I would suggest three divisions, practical chemistry, chemistry and physics, and materia medica and botany), that quite 30 per cent. of the successful candidates could be induced to continue their studies in the laboratory for another three months in order that they might pass the first portion of the examination, with a view of at some future time taking up the theoretical work, which portion could be passed by any student of ordinary ability without leaving business.

South Croydon.

G. S. V. WILLS.

Sir,—I have hoped that the suggestion of one of your correspondents, that candidates for the Major might be permitted to present themselves for examination in one or more subjects at a time, would be sufficiently important to deserve editorial comment. I suppose it will be generally admitted that the pharmaceutical body would be strengthened and the tone of the business raised if there were a larger proportion of Major men. A comparison between the percentage of Major men and of Minor men who remain outside the Society would be interesting. If my opinion is correct that a much larger percentage of Major men subscribe to the Society, it would be a strong argument in favour of the suggestion. It has been pointed out, and is perfectly true, that many having passed the qualifying examination and gone into business would most gladly continue their studies if a prospect of passing the higher examination, without having to leave business, offered itself. Every inducement and facility should be held out to pharmacy students to aim for the Major, both in the interests of higher education and of organisation. If there are good reasons why the suggestions should not be adopted, many would be glad to have them stated. If there are no such reasons it is to be hoped the matter will be taken up earnestly by the Council. Nux.

LABORATORY NOTES.

Sir,—I find that my manuscript notes furnished to you last week contained a hiatus which I should like to fill up. On page 855, column 2, lines 19 and 20 from top, at the end of the sentence—"as I will endeavour to show,"

should follow—Ext. anthemidis is directed to be made by boiling one pound of the flowers in a gallon of water until the volume of liquid is reduced to one-half, etc., and I mentioned that chamomile flowers contained more volatile aromatic principles than any other of the various substances used in making infusions. Ext. cascara sag. liq. is also directed to be prepared by boiling the bark in successive quantities of water. Syr. papaveris is also directed to be made by first infusing the capsules in four pints of boiling water, then percolating an additional quantity of boiling water until two gallons are obtained, or the mass is exhausted, afterwards evaporating down to three pints. In the preparation of vin. ipecac., we know how long and continuous heat must be employed to obtain a dry extract, which I have never yet been able to obtain.

Glasgow.

R. BRODIE.

THE REMUNERATION OF DISPENSERS.

Sir,—To those of our craft who are doomed by circumstance to be employés instead of employers, your article of last week is especially gratifying. It is necessary at times to draw the attention of both the members of our calling and of the public to the question of remuneration. Owing largely to the peculiar position we occupy between the trading and the professional class, more than those of any other department of workers, our claims are unconsidered; and I am convinced we shall never be more respected by the public until we have demanded that respect. While the ungenerous treatment of retail chemists is driving reluctant men to the parrot-like employment of the drug stores, those public gentlemen who constitute boards of guardians have no adequate knowledge of—no proper means of estimating—the value of a dispenser. Let me bespeak a little more consideration for the county dispenser. Outside London, where enlightenment most readily dawns, the dispenser is often treated, as far as remuneration goes, as a mere labourer. Here in Manchester, for example, a city which boasts its ready appreciation of merit, the assistant dispenser revels in a never-increasing salary of £85—a fortnight ago the Board of Guardians required a qualified dispenser for £75! Three months ago, the West Riding Asylum of Wakefield offered the magnificent sum of £104 for a pharmaceutical chemist! Do our “boards” consider these amounts are satisfactory to men of education and taste?

Manchester.

A. P. S.

Sir,—As a poor law dispenser I sincerely thank you for your leader of March 30. I trust the Local Government Board may soon see fit to raise our maximum salary, as at present it is not proportionate to our work and responsibility. The great improvements made of late years in the administration of the poor law, more especially in the relief of the sick, also make it most desirable that we should be men of good education and thorough capability. I trust all pharmacists and medical men who are guardians will support your suggestion.

GEORGE WALMSLEY.

St. Pancras Workhouse Dispensary, N.W.

THE SHAPES OF ATOMS.

Sir,—I see by your issue of this week that Lieut.-Col. Sedgwick in the *Chemical News* claims to have anticipated argon from his theory, published in 1890, that valency depends on the atoms having flattened sides. Now, why not allow my claim, though I am only a chemist and druggist? I enclose you a printed sheet entitled a “Theory of Things,” which I published as far back as 1881. In this occurs the following: “The chemical atoms are masses beyond the general power of the ether to subdivide; monads

are semi-spheres, each monad atom has therefore one flat side whereby it can cohere; diads have two flat sides, with all their other surface convex; triads have three flat sides, etc. Three theories there are, which can all reasonably enough explain how the atoms by gravity took these shapes; but it is enough to say here that the atoms must have these shapes or chemical action could not act as it does.” The first of the above three theories referred to is that “on the formation of the element atoms the cohesive force in their substance would first constitute them spheres thoroughly rounded, but before they had time to harden, so to speak, or became permanently fixed in that shape, mutual contact with each other would flatten certain portions of their surfaces; of course, the ether fluid in which they are bathed preventing their contact from becoming fixed connection.” (*Vide Pharm. Journ.*, February 23, 1895, *Epitome*, p. 61.) Hence it is more than probable that there will be atoms without valency, and they are most likely to be found in the higher reaches of the atmosphere. In fact, I might with certainty predict that the very topmost layer of the atmosphere is composed of an element lighter than hydrogen and without valency.

Glasgow.

J. J. BROWN.

DETERMINATION OF GLUCOSE.

Sir,—I observe from the report on page 852, that at the meeting of the Chemical Society held on the 21st ult., Professor Brauner described a modification of Pavy's method of determining glucose by its reducing action on ammoniacal Fehling's solution. The modification consists in covering the copper solution with a layer of vaselin or paraffin oil. I described this plan some months ago, my method of operating being fully described in the *Lancet* for July 28, 1894, page 213; the *Pharmaceutical Journal* for the same date, page 90; and the *Analyst* for August, 1894, page 181. The prior publication of the suggestion has evidently been overlooked by Professor Brauner.

Sheffield.

ALFRED H. ALLEN.

Answers to Correspondents.

R. Cleave.—You will find Jevons' ‘Elementary Lessons in Logic’ (Macmillan) very suitable for the purpose you mention.

“S. T.”—You are not likely to see a new edition of the British Pharmacopœia for some years yet, since even the preliminary arrangements for revision are not yet made.

“Analysis.”—Legg's ‘Guide to the Examination of the Urine’ (H. K. Lewis, London, 8s. 6d.) is one of the most recent and useful works on the subject. More advanced information will be found in Halliburton's ‘Chemical Physiology and Pathology’ (Longmans and Co., London, 25s.).

“Chemist.”—Are you certain of the facts in your statement, and may there not have been some other disturbing influence? We shall be pleased to inquire into the matter if you will write again, giving full particulars of the case described, which we assume was an actual one, and not merely hypothetical.

Corrections.—In Mr. Brodie's paper, published last week, for “Distilled water, to 8 fl. oz.” read “Distilled water, 8 fl. oz.” in the formula for mist. gentiana on page 856. In the same column, also, lines 16 and 17, for “some 2 ounces, I think,” read “in some two cases, I think.” These errors were due to imperfections in the manuscript.

COMMUNICATIONS received from Messrs. Armour, Brodie, Brown, Burroughes, Wellcome, and Co., Coull, Dawson, Dyson, Evans, Hill, Kirkby, Mackenzie, Reeve, Rogers, Smith, Squire, Sutton, Taylor, Umney, Welford, Wills.

EPITOME

OF

CURRENT EVENTS AND USEFUL INFORMATION.

Notes.

PRESIDENT OF THE CHEMICAL SOCIETY.—Dr. Augustus Vernon Harcourt, F.R.S., the newly elected President of the Chemical Society, is a son of the noted Admiral, and a son-in-law of the late Lord Aberdare, besides being a distant relative of the Leader of the House of Commons. He is Lees Reader in Chemistry at Oxford University, and in conjunction with Mr. Madan, of Christ Church, produced the well-known text-book in practical chemistry.

BACTERIOLOGICAL WONDERS.—The readiness with which the daily newspapers nowadays publish the grossest absurdities regarding alleged bacteriological discoveries is very marked. One of the latest wonders of this kind is the claim made by a Dr. Wheeler, of Chicago, to have discovered what he terms "the microbe of death," which can be destroyed like other microbes. It is said to resemble the microbe of consumption, and with its destruction nothing short of actual violence can, says the discoverer, put an end to anyone's term of existence. Another announcement is that a young Viennese physician, Dr. Marmorek, at present with Dr. Pasteur, in Paris, has discovered the bacillus the presence of which is declared to be the active cause of blood-poisoning and of inflamed wounds. He has named the bacillus *Streptococcus pyogenes*. Now, seeing that this organism, which, by the way, cannot be both a bacillus and a streptococcus, was first identified years ago and named by Rosenbach, and that besides being very common in smallpox and numerous fevers, it occurs in abscesses, gangrene, etc., Dr. Marmorek's discovery appears neither so novel nor important as might be imagined.

FORTHCOMING NEW BOOKS.—Messrs. Frederick Warne and Co. announce for publication this spring 'The Sheep Doctor: A Guide to the British and Colonial Flock-master in the Treatment and Prevention of Disease,' by George Armitage, with 166 illustrations, and 'Wayside and Woodland Blossoms,' a pocket guide to British wild flowers, by Edward Step, containing descriptions of 600 species, with 128 coloured plates. Messrs. W. H. Allen and Co. announce a third edition of 'Practical Microscopy,' by G. E. Davis, with 310 illustrations.

BAKERIAN LECTURE.—The Royal Society's Bakerian lecture which will be delivered on Thursday, May 9, is to be 'On the Laws of Connexion between the Conditions of a Chemical Change and its Amount.' It is to be based upon a research by Mr. A. Vernon Harcourt and Mr. William Esson.

PHARMACEUTICAL EXAMINATIONS.—The proportion of failures in the examination for registration as pharmacists in Massachusetts is vastly in excess of what is customary in this country, if the figures quoted in a Boston paper may be taken as accurate; for, according to this, the State Board of Registration in Pharmacy, at its session held March 5, 6 and 7, examined forty-three applicants for registration and granted certificates to five only.

FREE TRADE IN POISONS.—In a recent number of the *Globe* (see p. 120) the opinion is expressed that all poisons should be scheduled, instead of the limited number so treated at present, but our contemporary fears that such a beneficial reform would be "howled at by the trade as undue interference with commercial freedom." If "the trade" is to be interpreted "chemists and druggists" there is little reason to fear that they would object to so salutary a proceeding, though very decided objections might be anticipated from other traders.

THE TRADE IN GANJA.—Another instance of the difficulty of coping with the abuse of narcotics in the East by means of Government regulations is supplied by the fact that the attempt to suppress the importation of ganja into Burma is admitted by the Hemp Drugs Commission to be a failure. It is alleged that, despite the vigilance of the Excise officers, an enormous illicit trade has been carried on for some time past.

IS OXYGEN A MIXTURE?—At the weekly meeting of the Royal Society, held on Thursday, March 21, Professor Ramsay (on behalf of Dr. Bayley) made a preliminary announcement of some very remarkable experiments on oxygen. Two globes, connected by a glass tube and containing electrodes, were filled with oxygen. The apparatus, which is exactly like a dumb-bell, was filled with pure oxygen, and electric sparks were passed for some time from end to end of the tube. Whilst the sparks were still passing the bulbs were separated by sealing off with the blowpipe the connecting tube between the globes. The gas in each globe was then examined, and it was found that the densities of the two gases were 15.88 and 16.01, the mean of which approximates to the actual density of oxygen. It may be that in this experiment oxygen has been split up into two gases of different densities, and the results are very suggestive of the meta-elements or different degrees of condensation of protyle, as mentioned by Crookes. The confirmation or explanation of these results will be eagerly awaited by all chemists.

PARISH COUNCIL ELECTIONS.—Mr. Richard Clark (Messrs. Raines, Clark and Co.) heads the poll for Stephen's Ward, Edinburgh, and Mr. David McLaren, 42, South Clerk Street, heads the poll for St. Leonard's Ward. There were four candidates for two seats in the former ward, and three candidates for two seats in the latter.

Miscellaneous News.

SELLING ACETIC ACID ABOVE STRENGTH.—At Clerkenwell, on March 29, Alfred Honman, chemist, Upper Street, Islington, was summoned by the Islington Vestry for selling diluted acetic acid containing 11·7 per cent. of acid, which was 2·74 times the correct amount, and therefore too strong, according to the Pharmacopœia. Dr. Harris, medical officer of health, said that it was essential that drugs should be of the exact strength laid down in the Pharmacopœia. Mr. Horace Smith said he felt in a difficulty in the matter. The intention of the Foods and Drugs Act, in his opinion, was to prevent fraud, such as the dilution of milk or beer, but here the defendant was defrauding himself by selling something stronger than it need be. Dr. Harris said that if drugs were sold over-strong they might do harm to a person, or even cause death. Mr. Smith said that would lead to a charge of manslaughter. He hardly thought, with regard to the Foods and Drugs Act, that the Legislature had in mind cases of this kind. There seemed some need for a special provision. The defendant did not appear to have committed an offence under the Act. He would take time to consider the point, and give judgment which might lead to the point being decided by a higher court.

PHARMACEUTICAL FOOTBALL MATCH.—South London School of Pharmacy v. Westminster College. The return match between these clubs was played at Tooting on Saturday, March 30, when the South London team succeeded in reversing the result of the previous match, winning by one goal to nil. "Muter's" were not fully represented owing to two or three of their original eleven having left town for the Easter vacation. A very fast game, however, ensued, in which the South Londoners had the best of the exchanges, winning as above stated. Plumstead (who scored the goal), Dawson, Cooper, and Chambers played a grand forward game for the winners, whilst Smith on the outside right and the defence were the pick of the losers.

A FAMILY COMPANY AT TORQUAY.—At a special sitting of the Exeter Bankruptcy Court on March 28, an application was made to his Honour Judge Edge, *re* the Baylass Drug Company, Limited, Torquay. It was stated that Mr. Baylass was the manager of the Company, the only other members of which were connected with his family. There was a petition to wind up the Company by Mr. Baylass as a contributory, and there was a petition by the creditors against Baylass personally as being practically the Company. The Sheriff had sold, and this had constituted the act of bankruptcy. A point urged on behalf of the creditors was that in the event of the Company being wound up, the execution creditor would get the benefit; but if the receiving order was made, the Official Recorder would be entitled to the proceeds of the execution for the benefit of the creditors generally. Mr. W. Dale Baylass was examined, and said he was now residing at Heavitree with his mother and father-in-law. Prior to December, 1893, he resided at Stoke-on-Trent, where he carried on the business of a drug merchant. It was now conducted by his brother, to whom he sold it for £800. In December, 1893, not being a duly qualified chemist, he formed a Company for the purpose of carrying on the business of a chemist and druggist. He purchased a business from Mr. Ness, of Lower Union-street. The subscribers to the Company were himself, his wife, Walter Baylass, his brother, his mother, his mother-in-law, his

father-in-law, and Charles Baylass, his brother. Each paid £1. The nominal capital consisted of 2,000 shares of £1 each. None were offered to the public. He took 999. His Honour said that in his opinion, the registration of the Company was a mere sham. So far as Mr. Baylass and his creditors were concerned, they stood in the direct relationship of debtor and creditor. It seemed to his Honour that there was a sufficient act of bankruptcy against Mr. Baylass to adjudicate him a bankrupt. He did not want to make an order for the winding up of the Company, and if he did he would be admitting that the Company was a properly registered one, which he did not believe. He therefore adjourned the petition until the next Court. The restraining order would be continued, and the winding-up petition would stand over.

FREE TRADE IN POISONS.—The *Globe* remarks that "it is supposed that the law presents great difficulties to people who meditate the poisoning of themselves or other folks. The sale of certain deadly drugs is fenced round with all manner of precautions by a paternal Legislature; no intending murderer would attempt to obtain them at the risk of almost inevitable detection. Nor is there any need; for drugs can easily be obtained which bring about death with equal certainty. You have merely to drop in at a chemist's shop and ask for rat poison—as a young man did the other day when his thoughts lightly turned towards suicide. Twopennyworth sufficed; a pound of strychnine or of any other scheduled drug could not have wound up his earthly career more effectually. If, however, there be distaste for such a vulgar cure for all the ills of life as rat poison, example may be taken from another citizen of Derby, who simultaneously operated on himself fatally with laudanum. Then there is a third case at Preston, in which carbolic acid was successfully employed. In neither of these instances did the experimentalist meet the slightest difficulty in obtaining what he wanted. It follows, therefore, that had murder, instead of suicide, been in contemplation, the means would have been equally within reach. That being the case it certainly seems that scheduling some poisons, and leaving others equally deadly unscheduled, savours of the farcical. By far the best way would be to schedule all, but that reform, we suppose, would be howled at by the trade as undue interference with commercial freedom."

ROYAL INSTITUTION.—A General Monthly Meeting of the members of the Royal Institution was held on Monday, April 1st, Sir James Crichton-Browne presiding. The following were elected members:—Mr. Lockett Agnew, Dr. Julius Althaus, Mr. H. H. Dobree, and Mr. James M. Johnstone.

THREE TOWNS JUNIOR CHEMISTS' ASSOCIATION.—The monthly meeting of the Plymouth, Devonport, Stonehouse, and District Chemists' Association (Junior Section) was held at the Foresters' Hall, Octagon, on Thursday, March 28, when those present included Messrs. A. Barber, H. Buckner, H. Cantle, E. T. Cooks, T. Darke, A. V. Dewdney, F. Downing, E. W. H. Green, W. R. Vickery, and H. O. Westcott, Hon. Sec. The first of a series of Lectures on "Materia Medica" was delivered by Mr. John D. Turney. The lecturer referred to the handsome materia medica cabinet presented by the Pharmaceutical Society, and open to students as being most advantageous to those preparing for their examinations. He expressed a hope that it would be well utilised. At the close of the meeting Mr. Turney was heartily thanked for his very instructive and interesting lecture.

Technical Notes.

Ernest Beckman has suggested what he considers a useful datum in judging the quality of a milk—the taking of its freezing point; as this is only influenced by substances dissolved in it, and not those in a state of suspension. The higher the quality of the milk the lower its freezing point. His method of taking the freezing point is as follows: He surrounds the sample of milk, placed in a suitable vessel, with a mixture of ice and salt, and constantly stirs it with a thermometer until the point of solidification is reached. The temperature falls at first one or two degrees, but when the ice begins to separate it rises and remains constant for some little time, this period being taken as the freezing point. The thermometer he uses is graduated into one-hundredths of degrees, but as the addition of 10 per cent. of water to a milk only alters its freezing point five and a half hundredths of a degree, it would not be difficult to form an erroneous opinion of a sample.—*Public Health.*

In the report of chemical work of the U.S. Geological Survey just issued, a remarkable case is recorded of two spring waters from Missouri, both containing as a natural constituent zinc sulphate.

	Zn.	Ca.	Co.,	
No. 1 contained	120.5	61.1	120.5	per million.
" 2 "	132.4	63.1	110.0	" "

A peculiarity of these waters was that all the CO_2 was expelled by boiling. This is explained that on heating the water the ZnSO_4 decomposes the CaCO_3 , forming calcium sulphate, zinc hydrate, or a basic sulphate and CO_2 . This would give rise to serious error in estimating the total solids in the usual manner.—*Public Health.*

The atomic weight of tungsten has been revised by Professor E. F. Smith, of the Pennsylvania University, and the specific heat of the pure metal redetermined. The mean value of the atomic weight derived from nine determinations, taking oxygen as 16, is 184.92. The highest and lowest values obtained differed by only 0.02 from this mean value. The mean of two series, 184.8, may be taken as representing a close approximation to the true atomic weight of tungsten. This value is considerably higher than the currently accepted one, 184.02, the number afforded by Clarke and Becker's recalculation of the experimental results of older determinations. The specific heat of pure tungsten obtained during the course of the atomic weight determinations has been ascertained by Professor Smith in conjunction with Mr. Grodspan, the final mean value arrived at for the specific heat of tungsten being 0.0338, a result closely agreeing with former determinations. The atomic heat obtained by multiplying the new value for the atomic weight by this number expressing the specific heat is 6.25, a value in close accordance with that usually accepted as representing the constant of Dulong and Petit for the truly metallic elements.—*Technical World.*

Obituary.

Notice has been received of the death of the following:—

On March 26, Charles Read, Chemist and Druggist, Liverpool. (Aged 50)

On March 29, J. J. Welch, Chemist and Druggist, Kinver, Staffs. (Aged 49.)

Parliamentary News.

In the House of Commons on Monday last, Mr. Newdigate asked the Secretary of State for the Home Department if his attention had been called to the explosion of a gas cylinder charged with chlorate of potash which recently occurred at Fenchurch Street Station, causing the death of John Holbrook, and whether steps could be taken to have cylinders that are used for such purposes properly tested and duly stamped, so that their strength might be known by the users.

Mr. Asquith, in reply, said he had inquired into this matter, and had been advised that scientific opinion differs as to whether the bursting of these cylinders is due to the pressure of oxygen upon an imperfectly welded steel tube or to traces of impure substances present in the oxygen. He proposed to refer the question for the opinion of two or three distinguished experts on such matters.

Poisoning Cases and Inquests.

Laudanum.—Arthur Birnie, aged 45, died on Saturday, March 23, at 36, Whitaker Street, Derby, from the effects of laudanum, taken in mistake for medicine. Verdict: "Deceased died from laudanum accidentally taken."

Strychnine.—Joseph McDonnell, aged 18, died on Sunday, March 24, at 72, Stookbrook Street, Derby, from the effects of strychnine contained in a rat poison, self-administered. Verdict: "Suicide whilst temporarily insane."

Laudanum.—John Dunlevy, aged 55, died on Tuesday, March 26, in the Bradford Infirmary, (Yorkshire), from the effects of laudanum, self-administered. Verdict: "Suicide whilst in a state of unsound mind."

Foot-rot Liquid.—Frank Fox, a miller, died on Saturday, March 23, at Crosthwaite, from the effects of nitric acid, nitrate of mercury, and chloride of iron contained in foot-rot liquid, taken in mistake for Seigel's syrup. Verdict: "Death from misadventure."

Oxalic Acid.—Henry Rollison, aged 54, died on Wednesday, March 27, at 5, Tichborne Street, Brighton, from the effects of oxalic acid, self-administered. Verdict: "Suicide whilst temporarily of unsound mind."

Prussic Acid.—Eric Hamilton, aged 32, died on Thursday, March 28, at Hyde Park Road, near Plymouth, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Spirit of Salt.—A man named Carpenter, living at Lant Street, Borough, died on Saturday, March 30, in Guy's Hospital, from the effects of spirit of salt taken in mistake for beer.

Vitriol.—Thomas Wilson, a herbalist, died on Saturday, March 30, at Oldham Road, Manchester, from the effects of vitriol taken in mistake for cough balsam. Verdict: "Death from misadventure."

Aconite and Belladonna.—Saran Ann Ellison, aged 28, died on Wednesday, March 27, at 2, Palmer Lane, York, from the effects of aconite and belladonna contained in a liniment. Verdict: "Deceased took the liniment containing aconite and belladonna by mistake whilst in an advanced stage of consumption."

Carbolic Acid.—Cordelia Keeley, a parlourmaid, died on Tuesday, March 26, at West Lodge, Putney Lower Common, from the effects of carbolic acid taken for indigestion. Verdict: "Death from misadventure."

Spirit of Salt.—Joseph Fulham, died at 23, Blundell Street, Caledonian Road, London, from the effects of spirit of salt. At the inquest held on Friday, March 29, a verdict of "Death by misadventure" was returned.

Spirit of Salt.—Isaac Watts, aged 52, died on Tuesday, March 26, in the Queen's Hospital, Birmingham, from the effects of spirit of salt, self-administered. Verdict: "Suicide during temporary insanity."

EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.

A meeting of the Association was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Thursday, March 28, at 11 a.m., Mr. Peter Boa, President, in the chair.

The minutes of last meeting were read and approved.

Mr. W. Charles Baker was elected a member and Mr. J. Rutherford Hill an honorary member.

PRESCRIBING PROPRIETARY MEDICINES.

The meeting then proceeded to consider a draft circular to medical men on the subject of prescribing proprietary medicines, which had been drawn up by the Committee.

Mr. D. MacLaren said before going any further he thought they should consider whether or not such a circular should be sent out. He had never heard that the Inland Revenue authorities had interfered in any case where a chemist had dispensed a proprietary medicine alone and without admixture when it was prescribed by a medical man, and he did not think they ever would do so. He did not think they should raise this question at all. They would only bring trouble on themselves. They were perfectly free at present, and he would have no hesitation in breaking an original bottle to supply any of these preparations if a doctor prescribed it. He was speaking from an experience of about forty years, and he felt very strongly that they should take no action. Many of them would remember the time when it was quite common to open bottles of Dr. Collis Browne's chlorodyne in this way, and yet there never was any prosecution. If they raised this question they would have themselves to blame for bringing a hornets' nest about their ears. He would move that they take no further action in the matter.

Mr. Noble seconded the motion.

Mr. McDougall said he thought they ought to send this circular for the guidance of medical men. The makers of proprietary medicines were themselves taking steps to enlighten medical men on this subject. He therefore moved that the circular be sent.

Mr. Bowman seconded Mr. McDougall's motion, and said no doubt the Inland Revenue would soon get to know, if they did not know already, that these things were prescribed, and he did not think they should wait for a prosecution.

Mr. Boa said this proposal might have the effect of stopping the practice of prescribing these proprietary articles.

Mr. Henry, secretary, said this subject was first brought up by Mr. Macpherson, who said he objected to go on doing an illegal thing, and on this ground urged that something should be done to get over the present difficulty.

Mr. Forret asked what Mr. MacLaren would do if he

got a prescription for, say, two ounces of Fellows' Syrup.

Mr. MacLaren said he would give what the doctor ordered, and would supply it out of an unstamped bottle so long as the Government tolerated the practice.

After further discussion a vote was taken, and by a majority of 5 to 1 it was agreed to send the circular in accordance with Mr. McDougall's motion.

After some slight alterations on the original draft, the following circular was approved of and ordered to be sent to all medical practitioners in the Edinburgh district:—

THE EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.

Dear Sir,—We are requested by the members of this Association to ask the attention of the Medical Profession within the District to a difficulty which exists in connection with the PRESCRIBING OF PROPRIETARY MEDICINES, which are subject to INLAND REVENUE STAMP DUTY, when sold to the public.

Certain of these medicines are, by a concession of the Board of Inland Revenue, exempted from stamp duty for dispensing purposes, provided that they be not dispensed alone, but as part of a medicine.

To each original bottle of such Proprietary Medicines (of which Fellows' Syrup, Battle's Bromidia, Parke, Davis and Co.'s Cascara Aromatica are familiar examples) a label such as the following is attached:

The contents of this unstamped package are not to be used in any other manner than as a component part of a medicine prepared in accordance with a prescription of a qualified medical practitioner.

The effect of this is that when a chemist is called upon to dispense a prescription for say—

"Syrup. Hypophos. Co. (Fellows') . . . ʒiij."

he is legally required to put over the cork a medicine stamp, in accordance with the monetary value of the Syrup. If, in order to avoid making apparent to the patient the character of the medicine, he should dispense it without the Stamp, he renders himself liable to a penalty for so doing.

We respectfully suggest that when a Medical Practitioner desires to prescribe a medicine of the kind in question, this difficulty in regard to its dispensing can be obviated by prescribing it in combination with something else, however small in quantity. For example:

- | | |
|--|--------|
| (1) R. Syr. Hypophos. Co. (Fellows') . . . | ʒiiss. |
| Syr. Aurantii | ʒss. |
| (2) R. Bromidia (Battle's) | ʒi. |
| Syrupi | ʒi. |

Each of the Proprietary Medicines in these two formulæ is thus rendered

"a component part of a medicine,"

and consequently in conformity with the Inland Revenue concession they may be dispensed by chemists without a medicine stamp being affixed to the bottle.

The above statements do not apply to Pharmacopœial preparations such as:

Liq. Arsenicallis (Fowler) . . . ʒi.

Apologising for troubling you in regard to this matter.

We are,

Very sincerely yours,

1, Bromdon Terrace, PETER BOA, Chairman.
Edinburgh. CLAUDE F. HENRY, Hon. Sec.
April, 1895.

Messrs. J. A. Forret, and R. L. Hendry were appointed Auditors.

A discussion then took place as to the Annual Plonic, and it was remitted to the Committee with powers to make full enquiry and report to the next meeting of the Association.

The meeting then closed.

Australian Notes.

At a meeting of the Pharmaceutical Society of Australasia in January last, reported in the *Australasian Journal of Pharmacy*, a paper was read embodying some

PHARMACOPEIA SUGGESTIONS.

BY S. BARBOUR.

Commencing by stating that it had been his intention to make only a brief reference to the suggestions of the Victorian Committee, acknowledging their value, and paying a tribute to the energy of the sister colony in this and other branches of pharmaceutical science, the lecturer went on to say that recognising the advantage of following on a line known to all, he afterwards determined to first review the proposals referred to at some length, and then, if time allowed, offer a few suggestions on some preparations not mentioned in the report. Mr. Barbour then proceeded to criticise the Victorian suggestions (*ante*, p. 357). In regard to the first he considered that the removal of restriction in reference to the growth of various drugs should not be limited to one province, and contended for a clause extending such a privilege to all countries where experience had proved the various drugs could be grown, and where such an extension would be consistent with a high standard of excellence. The lecturer followed this by some stringent remarks on the mention of locality in any suggestions to the compilers of an Imperial Pharmacopœia. Referring to the second suggestion, Mr. Barbour said that in his opinion it would be better to omit the mention of the varieties of eucalyptus from which the oil should be obtained, and specify instead that it should contain not less than 50 per cent. of eucalyptol; reminding his audience that some of the richest oils have a gravity below .910, he thought that not below .900 at 60° F. should be the limit, and .925 for eucalyptol. He "based his remarks upon the experience gained in the extraction of several hundred pounds weight of eucalyptol." Here the lecturer remarked that a special process known as Faulding's might possibly be included in the new pharmacopœia. Remarking that when obtained from widely differing oils, eucalyptol had been found to be identical, Mr. Barbour passed on to mention preparations from eucalyptus, among which he singled out the ointment for adverse comment on account of the small percentage of eucalyptol contained in the leaves of the *amygdalina* variety, from which it is suggested this preparation should be made, and the marked reduction of the present strength which, he contended, this would entail. Touching the recommendation of *adeps lanæ* and soft paraffin as a basis for ointments, the lecturer, while admitting their suitability for some ointments, considered that for those medicaments which it was undesirable that the skin should absorb, they were not so satisfactory in view of the readiness with which lanolin conveys substances through the skin. He recommended various proportions of paraffin, hard and soft, with white or yellow wax, and maintained that if in the new pharmacopœia it were understood that *adeps præp.* and *paraffin-molle* apply to in hot and tropical countries might receive the addition of from 5 per cent. to 7½ per cent. of paraffin-durum, a difficulty now existing with regard to B.P. ointments would be removed. With the other suggestions Mr. Barbour expressed,

in the main, cordial agreement, and then passed on to mention the desirability of tables of specific gravity, solubility, etc., being added to the proposed pharmacopœia. The unsatisfactoriness of the keeping qualities of iodoform ointment, B.P., was touched upon, and the addition of a few drops of strong solution of caustic potash was a suggested preventative of change; and with the hope that suggestions from South Australia would be forthcoming, the lecturer closed an interesting address.

Mr. White moved that a hearty vote of thanks be accorded Mr. Barbour for his paper. To traverse the whole of it after hearing it only once was a matter of impossibility to a man with average memory, but he noted many suggestions of value, and hoped the members would have the opportunity of reading it at their leisure. He recognised the usefulness of the tables for gravities, solubilities, etc., and although his (Mr. White's) association with the Victorian Society caused him to have a very friendly feeling towards that body he agreed that the omission of the name of any locality in connection with the first suggestion of the committee might be desirable. He would be very glad to see some remarks furnished to the compilers of the new pharmacopœia by the South Australian Society. We ought, surely, to be able to do something in this direction. There were plenty of practical points, to say nothing of scientific ones, upon which the opinion of some members would be worth having. He hoped the Council would reconsider the matter, and he also hoped that Mr. Barbour's paper would be followed by others.

Mr. O'Connor, in seconding, was of opinion that the question of suggestions should be made an inter-colonial matter. He regretted the want of interest that had been displayed, but he was pleased to note that Mr. Barbour's paper had somewhat revived it. He thought that united action of the colonies might bring about additions and alterations suitable to this part of the world. He thought that particular processes should be ignored. Suggestions might be made and debated and opinions formed, but to make a particular process paramount under the name of a person or persons or firms would, in his opinion, be very objectionable. He thought that any suggestion should come from the Society as a whole and all should work together.

Mr. Hill thought that if anyone suggested a better process than another he should have the benefit of it. He was looking forward to the pleasure of reading the paper, and hoped it would be printed.

The Chairman cordially supported the vote of thanks. Mr. Barbour's valuable paper contained other matters than pharmacopœial ones that might with advantage be discussed. Mr. O'Connor's remarks re the Council again taking the matter up were opportune, and he could answer for that body that they would willingly reconsider it.

After some further remarks by Mr. Hill and Mr. White the vote was carried with acclamation.

Mr. Barbour thanked the members for the way they had received his paper. His object in writing it was the Society's benefit. He thought they might each take some preparation and specially study it with great advantage to the mutual good. In reply to Mr. O'Connor, he never proposed that any one preparation should be made official. The process he referred to was known in England as Faulding's, and he simply referred to it. He felt fully repaid for his trouble by the way his paper had been received.

Mr. White proposed that the Council reconsider the matter of pharmacopœia suggestions. Mr. O'Connor seconded. Carried. A pleasant social gathering brought the meeting to a close.

Patent Office Business.

PATENTS PUBLISHED MARCH 30, 1895.

Utilising spent pyrites (Mills, W.).—The residue from the burning of iron pyrites is powdered and passed over a magnetic separator to remove any ferrous sulphide and magnetic oxide. It is then mixed with 35 per cent. of finely-divided iron, and heated to dull redness. The ferrous oxide thus produced may be reduced to metal by heating with carbon or in a current of carbon monoxide, or other reducing gas. For preparing ferrous oxide for pharmaceutical purposes, the impure ferrous oxide obtained as above is dissolved in dilute sulphuric acid, precipitated with weak alkali, washed and dried first at 100°, and then at 350° C. The pure ferric oxide so obtained is reduced by heating to redness after admixture with 35 per cent. of levigated iron. No. 5300 of 1894.

Crutches, etc. (Smith, W. R.).—The ends of crutches, wooden legs, etc., are provided with a ferrule fitted with a leather or other shoe, and containing a spiral or other spring or an inflated indiarubber ball, etc., whereby jarring is prevented when striking the ground. No. 5478 of 1894.

Potassium cyanide (Mackey, W. McD., and Hutcheson, J. F.).—The cyanide is produced by heating by means of an air-blast in a cupola or other furnace, a mixture of coal or other carbonaceous matter and potassium carbonate. The mixture is fed in continuously, and the cyanide which is formed at the "hot zone" by the action of the atmospheric nitrogen, passes in the form of vapour through a lateral opening and is condensed. No. 6925 of 1894.

Thermometers (Kent, J.).—Refers to an improvement in patent No. 19,199 of 1890, and relates to a form of scale sealed in a flattened passage in the thermometer behind the mercury column. The ordinary enamelled scale is replaced by one of mica, the back of the thermometer being enamelled, but sufficiently translucent for the graduations on the scale to be read when held up to the light. No. 8369 of 1894.

Plating and soldering aluminium (Ramage, H.).—Aluminium is coated with metals or alloys which retain their lustre in the air, or surfaces of aluminium are prepared for soldering, by rubbing upon it an alloy which consists preferably of zinc with tin or cadmium, or both in stated proportions. These alloys are found to deposit crystals and become pearly at a much higher temperature than the true solidifying point, and if rubbed upon aluminium while the crystals are separating, will alloy with it and give a good surface when further heated and polished. Surfaces of aluminium so prepared may be soldered with more of the same composition, or with other solder. No. 8401 of 1894.

Treating spinal fractures (Despres, E. M.).—The invention relates to a couch or portable platform, on which the patient lies. Suitable appliances permit adjustment of the patient, and trap-doors arranged at intervals allow of the necessary dressings, etc., being done without moving him. No. 9736 of 1894.

Sodium bicarbonate (Crane, T.).—This salt is produced by the electrolysis of common salt solution. The electrolytic vats, each comprising an anode chamber and a cathode chamber as usual, are arranged in a connected series at different levels, so that the salt shall overflow from each anode chamber into that of the vat below, and the caustic soda solution produced by the electrolysis shall similarly circulate from the cathode chambers. The caustic soda solution is finally treated with carbonic acid gas in a long "standpipe" or cylinder, so that bicarbonate of soda separates in crystals. The mother liquor returns to the electrolytic vats. No. 9979 of 1894.

Peptonised milk beverage (Bernstein, A.).—To prepare this, skimmed milk or butter-milk is sterilised, treated with a preparation containing a certain bacterium whose growth results in the formation of peptones, and maintained at 20° C. for a few days. It is then added to more milk, and the treatment is repeated until enough has been peptonised. The caseine is said to be converted into albumose and peptone, and the liquid after being boiled is filtered, and is then called "galacton" by the inventor. It is fermented by means of the yeasts which are used for milk sugar by Duclaux and others, usually after addition of cane sugar, and the product is sold as a beverage. No. 10,105 of 1894.

Triturating and emulsifying medicaments (Cowan, W. B.).—The invention comprises a machine turned by a treadle or otherwise for grinding and mixing solid or liquid medicaments with water, oil, etc. The materials are contained in a revolving, open-topped chamber containing two "comma-shaped" grinding stones, whose weight grinds the materials, and whose shape is such as to mix them and direct them beneath the stones. No. 18,923 of 1894.

Suspensory belts (Thompson, W. P., communicated from Teufel, W. J.).—The portion which requires renewal is made detachable and of sufficiently simple construction to be cheaply replaced. It consists of a single piece of woven material with an opening for the penis. The leg straps are removable, and are formed of indiarubber tubing. No. 23,088 of 1894.

Food-product from blood (Finsen, O.).—"Hæmo-albumen" is obtained from blood by diluting it (after it has been freed from fibrin by whipping) with water containing a small quantity of citric acid. The mixture is heated to about 90° C. for fifteen minutes, and the coagulated albumen is filtered off, washed, dried at 45° C. *in vacuo*, and ground to powder. It is said to form a nutritious but tasteless food. No. 24,785 of 1894.

Preparing carbon for filters, etc. (Brandenburg, O. W., and Pott, F. H.).—Carbon for filtering water, and for general chemical uses, is prepared by heating coagulated blood, flesh, glue, or the like, to about 1270° F., by means of superheated steam or otherwise, with careful exclusion of air. After cooling to about 230° F., the residuum is broken into lumps and treated with concentrated sulphuric acid, which completes the carbonisation and removes all impurities. It may be further treated with hydrochloric acid. It is finally washed, dried, and powdered. No. 2203 of 1895.

Trade Marks Applied For.*

No. 185,596.—"SPIERPON."—Chemical substances prepared for use in medicine and pharmacy.—Spiers and Pond, Limited, 38, New Bridge Street, London, E.C. February 14, 1895.

No. 183,690.—"SPIERPON."—Perfumery.—Spiers and Pond, Limited, 38, New Bridge Street, London, E.C. November 16, 1894.

No. 185,056.—"LINDEN" and device: A group of trees in a shield.—Chemical substances used in manufactures or philosophical research, and anti-corrosives.—Actien Gesellschaft Georg Egestorff's Salzworke, Chemical Works, Linden, near Hanover, Germany. January 22, 1895. The essential particular is the device.

No. 188,701.—"THE CLEANSING DRENCH" and name and address of applicants on a label.—Chemical substances used for veterinary and sanitary purposes.—Corbyn, Stacey and Co., 800, High Holborn, London. November 16, 1894.

No. 185,398.—"TOMPO."—A drug for repelling moths from garments.—Ann Littlejohn Panter, 43, Langham Road, West Green, Middlesex. February 6, 1895.

No. 185,789.—"XL ALL LIQUID MANURE" and "XL ALL TOBACCO POWDER," with device: Applicant's monogram upon a vine-leaf.—A liquid manure, being a chemical substance included in Class 2, and tobacco powder, for destroying, removing, and preventing insects and blight on plants and trees, being a vermin destroyer included in Class 2.—George Henry Richards, Old Shot Tower Wharf, Lambeth, London. February 21, 1895. The essential particular is the device of the vine-leaf.

No. 183,702.—"CONF: OPII" and name and address of applicants on a label.—Chemical substances prepared for use in medicine and pharmacy.—Corbyn, Stacey and Co., 800, High Holborn, London. November 16, 1894.

No. 181,147.—"COCA TONIC CHAMPAGNE" and applicants' signature and address.—Coca tonic champagne, being a medicated wine for human use.—Laurent-Perrier and Cie, Bouzy près Reims, France, and 106, Fenchurch Street, London, E.C. December 7, 1894. The essential particular is the applicants' signature.

Remedies Introduced in 1894.*

Acetogen.—Used in manufacturing vinegar.
Aceton (not "Acetone").—Grip and headache remedy.
Acetonoresorcin.—Combination of two molecules of resorcin and one of acetone.—Antiseptic.
Acid. Glycerinophosphoric.— $(HO)_2PO.O.C_2H_5.OH$.—Nervine.
Adonis Æstivalis, Tincture.—Anti-fat remedy.
Algodyne.—Proprietary tooth tincture.
Alphol.—Salicylic ether of alpha-naphthol.—Internal antiseptic, like salol.
Aluminum Boroformate.—Disinfecting astringent.
Ammonol.—"Derivative of the Amido-benzene series."—Stimulant, analgesic and antipyretic.
Amylocarbol.—Mixture of nine parts of carbolic acid soap (150), amylic alcohol (160), and water (681).—Antiseptic.
Anadol.—Proprietary antipyretic and analgesic.
Analgesin.—Tablets containing acetanilid, ammonium chloride, caffeine and sodium bicarbonate.—Analgesic. ("Analgesine" is a French synonym of antipyrine).
Analgia.—Proprietary analgesic and antipyretic.
Analges-Laborde.—Another proprietary analgesic.
Andunaa.—Proprietary analgesic.
Anodin.—Proprietary ophthalmologic anæsthetic.
Antalgia.—Proprietary antipyretic and analgesic.
Antibailllin.—Proprietary disinfectant.
Anticlavus.—Proprietary pain reliever.
Antidiphtheritikon.—Bokai's mixture of oil birch (5), oil beech (3), alcohol (90), potassium carbonate (1), and potassium sulphide (5).—Diphtheria remedy.
Antidol.—Proprietary pain reliever.
Antidolor.—Proprietary anodyne.
Antifetor.—Proprietary deodorising powder.
Antipyonin.—Sodium tetraborate, soluble.
Antipyralgine.—Proprietary anodyne.
Antipyrargos.—"Coal tar derivative." Proprietary antipyretic and anodyne.
Antirheumatin.—Mixture of sodium salicylate and methylene blue.—Antirheumatic.
Antitetraizin.—"Quinine derivative."—Anodyne.
Antithermal.—Proprietary febrifuge.
Antitozine.—Proprietary antipyretic and anodyne. (Not to be confounded with the generic term "Antitoxin," the blood serums of immunised animals).
Apodyna.—Proprietary anodyne and antipyretic.
Areoline Hydrobromate.—Salt of alkaloid from areca catechu.—Laxative in veterinary medicine.
Argentamine.—Ethylenediamine-silver phosphate solution. A 1:10 solution of silver phosphate in 10 per cent. ethylenediamine solution.—Antiseptic astringent.
Arophens.—Proprietary dental anæsthetic.
Athanon.—Proprietary disinfectant.
Atherin.—Ammoniated pyrogallol solution.—Hair dye.
Bacillin.—Proprietary deodoriser and disinfectant.
Bacterine.—Proprietary "yeast cure for phthisis."
Benzacetine.—Acetamidomethylsalicylic acid.—Antineuralgic.
Bismuth and Sodium Iodide.— $BH_3.NaI$.—Alterative.
Bismuth-Naphthol Hydrate.—Chapin's antiseptic.
Bismuth Sulphocarbolate.—Antiseptic astringent.
Boral.—Aluminum borotartrate.—Disinfecting astringent.
Borsalicyl.—The result of the action of boric acid (25) upon sodium salicylate (32).—Antiseptic.
Brassicon.—Proprietary headache remedy.
Bromatin.—Bromethylformin.—Antiepileptic.

Caffeine Ovalate.— $C_8H_{10}N_4O_2$. $C_2H_5O_2$.
Calcium Glycerinophosphate.— $CaC_2H_7PO_4$.—Nervine.
Calolactose.—Mixture of calomel (1), bismuth subnitrate (1) and lactose (8).—Intestinal disinfectant.
Cannabindon.—Narcotic principle obtained from cannabine indica.
Cannonin.—Proprietary disinfectant.
Capitoura.—Proprietary antipyretic and antineuralgic.
Carbolin.—Coal tar disinfectant.
Chemia.—Antiseptic.
Chlorakaline.—Proprietary remedy like bromidia.
Chloriodolipol.—Chlorine, substitution product of phenol, cresote and guaiacol.—Inhalation antiseptic.
Chroastol.—Parasiticide dermic.
Chromosot.—Chiefly sodium sulphite and sulphate.—Disinfectant.
Cocaine lactate.— $C_{17}H_{21}NO_4$. $C_2H_5O_4$.—Specially adapted in the local treatment of tuberculous cystitis with lactic acid.
Collasin.—Schiiff's skin varnish.
Coronillin.—Glucoside from coronilla scorpioides.—Cardiac.
Cryotase.—Mixture of equal parts of carbolic acid, camphor, and saponin, with traces of turpentine oil.—Becomes solid when heated, and liquid when cooled to below 0° C.
Crystalline modified.—Solution of pyroxylin (1) in a mixture of methyl alcohol (4) and amyl acetate.—Dermic.
Cutal.—Aluminium borotannate.—Disinfecting astringent.
Cutal Soluble.—Aluminium borotannotartrate.
Dermol.—Bismuth chrysophanate.—Astringent dermic.
Dermolin.—Proprietary ointment-base (soap).
Diaphthol.—Quinaseptol; Orthoxyquinolinemeta-sulphonic acid.—Internal antiseptic.
Diatomit.—Disinfectant.
Diiodoform.—Tetra-iodoethylene.—Antiseptic.
Diphthericide.—Pastilles of thymol, sodium benzoate, and saccharin.—Prophylactic against diphtheria.
Emulsin.—Paraffin oil oxidised under pressure.—Emulsifier.
Entomofobo.—Insect killer.
Eurybin.—Glucoside from eurybia moschata.
Furcol.—Proprietary anodyne and antipyretic.
Febrinol.—"Coal tar product."—Anodyne and anti-rheumatic.
Ferratin.—Compound of iron extracted from the liver of the hog. Contains 6 per cent. Fe.—Hæmatioic.

(To be continued.)

Publications Received.

LA VOIX MODIFIÉE PAR LES INHALATIONS. By Dr. A. SANDRAS. Pp. 107. Paris: G. Masson. From the Publisher.
 THE SPIRIT OF COOKERY. By J. L. W. THUDICHUM, M.D., F.R.C.P. Lond. Pp. 701. Price 6s. London: Baillière, Tindall and Cox. From the Author.
 CLINICAL LECTURES ON THE PREVENTION OF CONSUMPTION. By WILLIAM MURRELL, M.D., F.R.C.P. Pp. 103. Price 3s. 6d. London: Baillière, Tindall and Cox. From the Author.
 DIETETIC'S HELFENBERGER ANNALEN, 1894. Pp. 66. Berlin: JULIUS SPRINGER, 1895. From the Publisher.
 THE MEDICAL REGISTER FOR 1895. Pp. 1446. 6s.
 THE DENTISTS' REGISTER FOR 1895. Pp. 230 3s. 4d.
 THE MEDICAL STUDENTS' REGISTER FOR 1895. Pp. 84. 2s. 6d. London: Spottiswoode & Co. From the Registrar to the General Medical Council.

* From the American Medico-Surgical Bulletin.

Notes and Queries.

CLEANING CLOTHING.

[825.] Turpentine, ammonia, and water are the chief ingredients in preparations supplied for washing purposes. A small proportion of methylated spirit is sometimes added with advantage. According to the *Scientific American*, Mullerson's preparation is a mixture of turpentine, 26½ parts; ammonia solution, 19 parts; methylated spirit, 25 parts; ether, 2½ parts; acetic ether 2½ parts; and water, 25 parts; all by weight.

INK FOR RUBBER STAMP PADS.

[826.] Inks suitable for typewriters serve equally well, with slight modification, for stamping pads. Thus oil-soluble aniline colours, when dissolved in castor oil, answer for either purpose. A modification of a typewriter ink recently given (*Epit.*, p. 107) may be used, and is as follows:—Castor oil, 4 parts; creosote or carbolic acid, 1 part; cassia oil, 1 part; and oil-soluble aniline colour, 1 or 2 parts. As a rule, however, oily inks are unsuitable for rubber stamps, those prepared with glycerin being preferable. A general formula for the latter is as follows:—Aniline colour, 1½ oz.; boiling water, 6 oz.; methylated spirit, 6 oz.; glycerin, to make 1 lb. Mix in the order given. Half of the glycerin may be replaced by treacle. The spirit is necessary to ensure rapid drying.

LIME CREAM.

[827.] An inseparable preparation may be made by shaking almond oil, 3 lbs., with liquor potassæ, 2 fl. oz., in a clean, dry bottle, then gradually adding in small quantities at a time, water, 8 to 12 fl. oz., according to consistence required, and shaking after each addition. Finally add fresh essence of lemon, ½ fl. oz., and after again shaking the preparation will be complete.

NUTRIENT GELATIN.

[828.] To prepare this, first make beef broth by mincing 450 Gm. of lean beef, free from all fat and connective tissue, and boiling for half an hour in a large flask, with a litre of distilled water. Filter and make up to one litre with water, then add sodium chloride 5 Gm., and pure peptone, 10 Gm. Heat the mixture in a flask, on a water bath at 100° C., for an hour, shaking from time to time. Now cautiously add concentrated solution of sodium carbonate until faintly alkaline, and again heat at 100° for half an hour. Next allow 100 to 120 Gm. of sheet gelatin to soak in the broth for half an hour to an hour, heat slowly on a water bath until the gelatin is dissolved, neutralise carefully, and again heat for half an hour. Then add the white of an egg, heat till all the albumin is precipitated, and finally filter through two layers of moist filter paper, on a hot water funnel, into sterilised flasks, and sterilise in a steam steriliser for twenty minutes on each of two successive days.

BRONZE PAINTS.

[829.] In mixing the so-called gold and silver paints, it is necessary to carefully avoid the least trace of acidity in the medium. This consists preferably of mastic or dammar dissolved in a large proportion of benzol. Neutralisation may be effected by heating the crushed resin with dried sodium bicarbonate until effervescence ceases, then dissolving and filtering; or, the varnish may be shaken with liquor potassæ after solution is effected, and carefully decanted after separation has taken place. Add a quarter of an ounce of the finest bronze powder to each fluid ounce of medium, and shake each time before use. Another medium that gives good results is a solution of pyroxilin or celluloid in amyl acetate and acetone. It should form a perfectly transparent film when dry, and not be kept too long, since, like collodion, it tends to solidify under certain conditions.

Trade Correspondence.

[Under this heading the Editor proposes to publish letters dealing more especially with the trade aspects of pharmacy. Correspondents should write on one side of the paper only, and as concisely as possible, preferably with name and address for publication.]

EARLY CLOSING OF SHOPS.

Sir,—Chemists seem to be regarding the Shop Early Closing Bill with apathy, but the publication of your note on the subject (*ante*, p. 843) may make them consider whether it will in any way affect their interests. From the peculiar nature of our calling it is one the management of which must be left entirely to the discretion of the proprietor himself, and although the majority would hail with satisfaction an opportunity of obtaining a weekly half holiday, there may be instances where such a proceeding might be attended with very serious results to one business, whereas a neighbouring business, owing to a different class of trade, would be little affected. Even if only on the ground of resisting encroachment on individual liberty this measure should be resisted; grandmotherly government is going too far. Imagine the store chemists of a neighbourhood desiring to take a half holiday on a certain day of the week, which they could do without any detriment to their business, and compelling a neighbouring pharmacist who is entirely dependent upon a dispensing trade to suspend his business exactly at a fixed hour on penalty of dragging him into the police court. Would the plea that we are "professional men," not "traders," hold?

AN INTERESTED PERSON.

MINIMUM CUTTING PRICES.

Sir,—Many years ago I endeavoured to point out to your readers the futility of cutting prices, and had the principles I then tried to inculcate been more generally carried out, I venture to think that the retail trade of to-day would be in a more satisfactory condition.

While thoroughly appreciating the various efforts of manufacturers to maintain prices and allow fair profits to the retailer, I am inclined to agree with Mr. Allen on the question of giving free trade principles their due, and should prefer not to be hampered with agreements, feeling that so far as the control of retail prices is possible the best plan to prevent cutting and maintain a fair uniformity is for proprietors to make so little difference between wholesale and retail prices as to practically leave no margin for underselling, and if at the same time they abolish extra discounts for quantity the anomaly of an article being sold at any price but that at which it is advertised is quite done away with.

Where I think so many make a mistake is in trying to make rules which are only applicable to purely trading concerns apply to the business of a chemist and druggist, a calling differing from all others in that it consists of such a strange and inseparable mixture of trading and professional duties, its votaries naturally expecting more than a grocer's profits, for they sell generally under different circumstances and conditions. I fail to see how the accomplished pharmacist of the rising generation can care to deal in articles that any oilman can, and does, sell and be content with the same profit.

Therefore it seems to me that the only way out of the difficulty is to give up such unprofitable transactions, and though in these views I fear I am largely in the minority, I cannot help thinking that the time has come when our leaders should dare to boldly relinquish at least such trading as is carried on only as a bait to bring other business, for I fancy that the artifice cuts both ways, the public finding us playing tricks in selling soap may give us credit for employing similar tactics in dispensing medicine. The fact of huge drug stores opening in all directions makes our business more difficult than ever, but, speaking generally, my own impression is that goods which can only be sold at minimum cutting prices are not worth handling at all, especially when it is borne in mind that such small profits are very conducive to commercial trickery of one kind or another.

20 Boundary Road, N.W.

J. J. CHAPMAN

PHYSICO-CHEMISTRY.

THE recognition of the importance to the pharmacist of some knowledge of physics is a matter of very recent date; and even now probably very many would be inclined to regard such knowledge as more ornamental than useful. That the value of the subject is being recognised, however, is shown by the fact that in the Major examination a distinct paper is set in physics, and as much time is devoted to this subject as to chemistry, botany, or materia medica, so far as the written portion of the examination is concerned. Nevertheless, it may be advisable, before proceeding to discuss any physical operations, to point out clearly the relationship of this branch of knowledge to those others, the importance of which to the pharmaceutical chemist will at once be admitted.

The term physics includes the well-defined sciences of heat, optics, acoustics, and electricity and magnetism. As, however, these branches of knowledge all touch or overlap each other at their borders, so do they also touch on the science of chemistry; and it is to the touching or overlapping regions of those sciences with chemistry, and to a number of matters connected with chemistry, and not falling under any of the above heads, that the term physico-chemistry may be suitably applied.

The science of chemistry is every day making advances along the line of our knowledge of the quantitative aspects of chemical change. The introduction of the balance into chemical work by Lavoisier, which led to the determination of the quantity of each of the substances taking part in a chemical change, produced a revolution in the attitude of chemists to the reactions they studied, and laid the foundation of modern chemistry. But a scarcely less notable revolution has been gradually taking place in late years, and chemists now recognise the importance of also determining quantitatively the non-material factors of chemical actions, as for instance, the amount of heat produced or used up; and of measuring accurately such properties of chemical substances as their power of refracting light, etc. The arrangement of the known chemical elements in the "periodic table" of Mendelejeff has done much to bring to light the fact that there exist well-defined relations between the atomic weights of elements and all their other properties, including such as density, colour, conductivity, specific heat capacity, etc., usually called physical. In the case of compounds, very many of these properties depend directly on the nature and arrangement of the atoms composing the molecule; and consequently much work has been done and much more remains to be done in measuring the physical properties of elements and of large groups of compounds; the actual experiments necessary being usually, though not always, strictly physical, while the end in view is a purely chemical one, namely, the gaining of an insight into the qualities and "power of doing" of particular species of matter. It is impossible to fully appreciate or understand this department of chemistry without some knowledge of the processes that have to be carried out; and the importance of this branch of the subject is such that no one can claim to have much knowledge of chemistry who has omitted to acquaint himself with it.

But it is not only for the sake of its bearing on chemical theory that the pharmaceutical chemist should have a knowledge of physico-chemistry. In the ordinary every-day operations of pharmacy and practical chemistry, physical measurements are of constant occurrence, and for their adequate performance something more than a mere mechanical knowledge of them is necessary. In addition, the necessity for exactitude which is so characteristic of all physical operations that are to have scientific value, provides excellent discipline for the pharmaceutical student.

Two of the operations most frequently performed by the pharmacist belong strictly to the domain of physical measurements, namely, the measurement of volume and the measurement of weight or mass; and although it is generally not necessary that they should be performed with the same accuracy as when they are to form the basis for exact theoretical considerations, yet a full practical knowledge of the conditions affecting their accuracy is a very great gain. Among other operations that a pharmacist is commonly called upon to perform, that belong to the category of physical measurements, may be mentioned determinations of melting and boiling points, of specific gravity, solubility, specific rotatory power, etc. In what follows the determination of some of these quantities will be described in some detail.

WEIGHING, OR MEASUREMENT OF MASS.

The most fundamental of all measurements is the measurement of mass. The mass of a body in terms of a fixed unit, the grain or gramme, for instance, is ascertained by comparing the action of gravitation on the two, which is what is called weighing. The mass of a body is proportional to the attraction exerted on it by the earth. In weighing, therefore, it is important that the actual gravitative forces acting on the body under experiment and on the standard mass should be compared, and any opposing force, such as the buoyancy of the air, which acts unequally upon them, will give rise to an error which must be got rid of. As a first essential to exact weighing, a reliable and delicate balance must be used. The short-beam instruments that are now coming into general use are much to be commended, as they can be made quite as accurate as those with long beam, and the time occupied in weighing with them is much less. They are also less expensive. If the arms are not absolutely the same length, the weighing should be by substitution; that is, the body to be weighed is placed in one pan and counterbalanced by any suitable material in the other; it is then removed and replaced by weights until equality is again reached; the weights that have now been put on, of course represent the true weight of the body, subject to the condition mentioned below. Weighing should always be by oscillation, that is, the balance is allowed to swing gently, and equilibrium between the arms with their loads is reached when the distance to which the pointer swings on one side of the zero is intermediate between the distances to which it goes in the preceding and succeeding swings on the other side. The pointer moves close to a divided scale to facilitate such readings. Very small weights are not placed on the scale-pan, but are given by means of a little wire weight, the rider, that slides along one arm of the beam and

represents different weights according to its position as read on the graduated beam.

If the substance that is being weighed has a low specific gravity, or is contained in a large closed vessel, the volume of the air that it displaces will be much greater than the volume of that displaced by the weights that counterbalance it, and it will consequently be more supported by the air, and its apparent weight will be less than is correct. This may be overcome in some cases by using among the weights that counterbalance it some body that has as nearly as possible the same volume. If, however, this cannot be done the apparent weight must be corrected as follows. The difference between the true weight and the apparent weight is the weight of the air that it displaces, that is, of a volume of air equal to its own volume. The volume is found by dividing the weight of the body (the apparent weight is sufficiently correct) by its specific gravity; if the weight is in grammes this gives the volume in cubic centimetres. Multiplying this volume by .0012 (the weight in grammes of 1 C.c. of air under ordinary conditions), we obtain the weight of air displaced; this is added to the apparent weight of the body. Similarly the weight of the air displaced by the weights is calculated, and that of course is deducted from the apparent weight of the body. In this way its weight in a vacuum is found.

It is here assumed that the weights used have actually the values assigned to them by the makers, but this is frequently not the case. The errors of the weights must be determined by comparing them with each other by weighing, and so establishing fixed relations between them all. If one of them can then be compared with a standard, the others are, of course, all referred to this one. When this cannot be done the assumption is made that the sum of all the weights has actually its nominal value; this is a safe assumption, as the errors will in general be as often on one side as the other, and any small error that is not so compensated is quite inappreciable when divided among the whole set. By finding what fraction of the whole is formed by each individual weight, its true value is obtained; this is recorded and used in actual work instead of the nominal value. Fuller details of the corrections here referred to are given in Kohlrausch's 'Introduction to Physical Measurements.'

CORRECTION OF APPARATUS.

In general, it may be said that for any accurate physical measurements the apparatus used must first be tested and the necessary corrections ascertained. The graduations on a burette, for instance, while almost always sufficiently correct for ordinary volumetric analysis, require careful correction when very accurate results are required. Since weight is one of the best defined properties of matter, and admits of very accurate measurement, corrections are made whenever possible by a method of weighing. Calibration of a burette is accordingly carried out by weighing the quantity of mercury or water that occupies apparent unit volume (1 C.c. or 2 C.c.) at every different part of the tube.

Another correction that is more frequently required is that of a thermometer when accurate temperature measurements are necessary, as in the determination of melting points and boiling points.

The errors to which the readings of a thermometer are liable arise from two sources. In the first place the bore of the tube is scarcely ever of the same diameter at all parts of the stem, so that equal lengths of the stem will not contain equal quantities of mercury, and since the degree marks are usually at equal distances an error arises from this fact. Secondly, the bulb of a thermometer undergoes a slow contraction for a long time after it is made, so that if the freezing and boiling points were correctly marked in the first place, they come to be incorrect, and this error may even amount to several degrees.

In correcting a thermometer the true temperatures corresponding to a number of readings of the mercury at different parts of the stem are ascertained, and the corrections for intermediate points are made by the method of interpolation, which will be described hereafter. The direct corrections may of course be made by comparison with a standard instrument in a suitable bath; but a standard thermometer is not always at hand, and another plan must be adopted. The method here given is that of Hållström, and is mainly taken from Ostwald's 'Physico-chemical Measurements.'

Let us suppose we require to correct a thermometer from 0° to 100°; we leave the correction of these two points till afterwards, and proceed to ascertain the error due to inequality of the bore. To do this it will be necessary to separate successively from the rest of the mercury, threads of approximately the lengths 20° and 25°. This is managed as follows. Warm the bulb so that the mercury begins to rise in the stem, then invert the thermometer and give it a smart tap at the end on the table. In this way a thread of mercury is separated, which will in general not be of the required length. Now warm the mercury in the bulb until it rises and joins the detached thread, and note the point on the scale at which the union takes place; warm or cool the bulb until the height of the mercurial column is just 20° above that point, invert and tap again, and a thread of 20° length will be separated. The exact length of this thread has now to be found in different parts of the tube. The thermometer is fixed to a piece of board by strips of indiarubber, and put in a horizontal position. The exact positions on the scale of the ends of the mercury thread are read by a lens fixed on the three legs; to avoid parallax error, the lens is covered except a small portion in the centre, or two parallel hairs are stretched across it, one above and one below, and these must appear to coincide with one another and with the end of the mercury. One end of the thread is now brought to 0° by gently tapping in a vertical position, and the exact position of the other end is found. Similarly its length is found starting from 20°, 40°, 60°, and 80°. These lengths will in general not be the same, and will differ a little from 20°. If we subtract 20 from each, and take the mean of the five remainders, the result is the amount by which the length of the thread taken exceeds the fifth part of the distance from 0° to 100°. Deduct this mean excess from each of the first four direct readings; the results give us lengths corresponding to one-fifth of the distance from 0° to 100° in the different parts of the tube, and from this the true points 20°, 40°, 60°, 80° are easily obtained. An

example will make this clearer; let the following be the measurements obtained:—

From	Length	Excess over 20° equals
0 to 21.2	21.2	1.2
20 " 40.8	20.8	0.8
40 " 61.0	21.0	1.0
60 " 81.5	21.5	1.5
80 " 100.9	20.9	0.9
		5.4

The mean excess over 20 is thus $\frac{5.4}{5} = 1.08$

The apparent length of one-fifth of the distance from 0° to 100° will therefore be, in the respective portions of the stem—

21.2 - 1.08 = 20.12
20.8 - 1.08 = 19.72
21.0 - 1.08 = 19.92
21.5 - 1.08 = 20.42
20.9 - 1.08 = 19.82

and the following points are found:—

True temp.		Read temp.
20°		20° 12
40° = 20.12 + 19.72		= 39° 84
60° = 39.84 + 19.92		= 59° 76
80° = 59.76 + 20.42		= 80° 18
and 100° = 80.18 + 19.82		= 100°

Next measure with the same thread the distances 5-25, 10-30, 25-45, 30-50, 50-70, 55-75, 70-90, 75-95, subtracting from each distance read, the mean excess of the thread over 20°, in the example 1.08. Now shake the thread down to the bulb again, and separate a new one of length about 25°. By a method exactly like the above, find by how much this exceeds the true length of one-fourth of the distance from 0° to 100°, and fix the true points 25°, 50°, 75°. Also measure with it the distances 10-35, 15-40, 20-45, 35-60, 40-65, 55-80, 60-85, 65-90, using the corrected length of the thread as before. Having now fixed the points 20°, 25°, 40°, 50°, 60°, 75°, 80°, we use the remaining measurements to get other points from these. Thus we have:—

5° = 25° - 20,	15° = 40° - 25,	30° = 50° - 20
35° = 60° - 25,	45° = 25° + 20, or	20° + 25
55° = 75° - 20 or 80° - 25	65° = 40° + 25	
70° = 50° + 20	85° = 60° + 25,	95° = 75° + 20
and 10° = 30° - 20 or 35° - 25.		

In all cases where a point is given by two independent measurements the mean is taken if they differ, and the closeness with which they agree is a measure of the accuracy of the work. We have now corrected the stem at points distant by five degrees; the corrections for intermediate points are found by interpolation.

It remains to correct the freezing and boiling points. If corrections are required above 100° the measurements of the threads are continued as far up the stem as necessary, and the corrections so obtained. To find the true freezing point, the thermometer is clamped vertically in a vessel containing pounded ice, standing in an outer vessel containing ice and water. Care must be taken in reading with a lens to avoid parallax; several readings are taken at intervals of a few minutes, and the position of the mercury must remain unaltered, or the determination cannot be taken as satisfactory. To find the

boiling point, the thermometer is fixed by a cork in the neck of a clean vessel in which distilled water is boiled, in such a way that the bulb and the stem almost up to the 100° division are in the steam; if great accuracy is required, there must be an outer vessel or jacket also containing steam, as in Regnault's hypsometer; for most purposes a distilling flask with a wide neck and a fairly long side-arm is sufficient. The top of the mercury column should be just visible above the cork, and its position is read with a lens. This will be 100° C. if the barometer indicates a pressure of 760 Mm. of mercury reduced to 0°. If the atmospheric pressure is greater or less than this, the boiling point found will be above or below 100°, and if the pressure is known the boiling point is found from the tables that are published. For small deviations from normal pressure, there is a change of 0° 1 in the boiling point for every 2.68 Mm. in the height of the barometer.

If the corrections at 0° and at 100° are equal, it is only necessary to add (or subtract, as the case may be) this correction to all the corrections previously made for the stem. If the corrections at 0° and 100° are not equal, the correction at 0° is added as a constant error, and in addition, to each correction is added a fraction of the difference between the corrections of 0° and 100°, proportional to its distance from 0°. This is most conveniently done by the graphic method, as will be described hereafter.

(To be continued.)

MODERN MATERIA MEDICA.

NOTE-BOOK OF MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS. By R. E. Scoresby Jackson, M.D., F.R.S.E. Fifth Edition. Revised by J. Rutherford Hill and Ralph Stockman, M.D., F.R.C.P.E. Pp. 743. (Edinburgh: J. Thin, 1895.)

THE preface to this edition of Dr. Scoresby Jackson's 'Materia Medica' contains certain explanatory statements, the consideration of which may contribute to a correct appreciation of the work itself. Thus, it is stated in the preface that

"The re-editing of this volume was begun several years ago by the late Dr. Moinet. The first portion was printed off from his revision, and in view of the probable appearance of a new edition of the British Pharmacopoeia, it has seemed best to the publisher that this part should be left untouched."

The present editors have therefore begun where Dr. Moinet left off, and have incorporated the addenda to the British Pharmacopoeia partly in the text and partly in an appendix. The text and scope of Dr. Scoresby Jackson's original work have been as little interfered with as possible, "so as to preserve the distinct individuality of the book," which is expected to "prove of special value to pharmaceutical students."

It appears, therefore, that the work is in more respects than one hybrid in its nature. Originally compiled by Dr. Scoresby Jackson, and subsequently edited by Dr. MacDonald, it has now been re-edited partly by Dr. Moinet and partly by Dr. Stockman, in conjunction with Mr. Rutherford Hill. Further, it is intended for the use of two classes of students, the medical and the pharmaceutical.

It is a question for serious consideration whether at the present time the endeavour to combine in one work such information concerning drugs as the medical student desires with such as the pharmaceutical student finds necessary is in itself well advised. Consider for a moment the changes that have been made since the publication, in 1866, of the first edition of Dr. Scoresby Jackson's 'Note-Book'—changes conspicuous enough in the pharmaceutical world during the last few years alone—and evidenced, if evidence be required, by the increased and increasing stringency of the examinations, an indication of the opinion entertained by leaders in pharmacy, that the pharmacist of the future should and must be far more intimately acquainted with the chemistry and pharmacognosy of the drugs he handles than has hitherto been considered necessary. The demands made upon the medical student have also grown, but in a different direction. To him the chemistry and pharmacognosy of drugs have lost much of their importance, whilst pharmacology and therapeutics have gained in more than equal proportion. From a pharmaceutical point of view, the desirability of separating pharmacy and materia medica, both inorganic and organic, to be dealt with by specialists, has long been recognised, and surely indications of a similar specialisation on the part of medicine are not wanting. Is it then desirable to retain the "distinct individuality," not of this work alone but of all similar ones, after the conditions that called them into existence have undergone such radical changes?

It will be interesting now to turn to the volume itself and ascertain by impartial examination to what extent it satisfies by judiciously selected and accurate information the requirements of the medical and the pharmaceutical student. To the latter the "selection and collection of medicines" is a subject of great importance, and in the chapter with that heading such information as the following is to be found:—

"A decorticated tree affords wood doubly rich in medicinal principles, not only on account of its extra density, but also because it is found that trees deprived of their barks whilst standing become more quickly the prey of insects; and as these do not remove the more active parts, weight for weight, such wood is more valuable than that procured in the ordinary way" (p. xxiv.).

Of barks it is said that

"when too old their extractive matters become impaired and their saline ingredients are exhausted by the rain percolating through their numerous fissures" (p. xxvii.).

"Extractive principle" is even now "ill-defined," but is said to be recognised by its

"amorphous condition and brownish colour, by its distinct but variable taste," etc. (p. xxxi.).

Again, we are told that

"cellulose, or cellular matter, is an organised substance . . . occupying the cell walls of plants," and that "lignin is used externally in the form of cotton and lint" (pp. xxxii. and xxxiii.).

These statements, and many of like character, which are to be found word for word in the edition of 1871, speak for themselves. Twenty-four years have not sufficed for their correction! The circumstance that the present editors are probably not responsible for this part of the volume cannot

remove the fact that such statements are embodied in a work offered to students.

The second part of the volume deals with inorganic materia medica. Here, speaking generally, the preparations and characters are taken bodily from the present or the previous edition of the Pharmacopœia; the tests, which were included in Dr. Scoresby Jackson's original work, but were omitted by Dr. Moinet from the fourth edition, are still regarded as unnecessary, and only a stray one finds its way into the text. Yet these are becoming more and more essential. Neither pharmacists nor physicians manufacture the chemicals they use; these are purchased from men who have made their manufacture a specialty, and the pharmacist at least finds himself compelled to extend his knowledge of the tests by which he can establish the identity and gauge the purity of such preparations.

The third part of the work, which deals with organic materia medica, is more satisfactory. The classification adopted is botanical—an arrangement that has received the approval of the late Professor Flückiger. Here, too, the pharmacopœial descriptions have been introduced, and to these notes have been appended indicating drugs that the characters detailed would exclude. The plan that has been followed is sound, but the hand of the expert is missed. Under *podophyllum*, for instance, the researches of Podwysotzki and of Kürsten, which resulted in the isolation of both active principle and colouring matter in a pure and crystalline form, have been ignored. Burck's work on the species of *Erythroxylon* yielding coca leaves, and Beckurt's on the alkaloids of *cusparia* bark appear to have been passed over. The old nitric acid test for the latter is most misleading: in this, as in the two *quassia* woods the only certain means of distinction is to be found in the structure. In the smaller details of the work many erroneous or only partially correct statements are also discernible.

For the medical student, on the other hand, the conditions are much more favourable. Though he will doubtless find much that he will consider unnecessary, such portions of the work he can at least pass over. The pharmacology and therapeutics of the majority of drugs are accurate and well written; the style is as concise as it is lucid and attractive, and this part of the work will, without doubt, receive from the medical student the welcome it deserves.

It must, however, be admitted that the remarks previously made indicate the unsuitability of the work for pharmaceutical students, and confirm the opinion that the endeavour to produce a materia medica that shall fulfil the requirements of both pharmaceutical and medical students is an attempt forcibly to unite two branches of a discipline, which year by year are becoming more and more divergent. The value of Dr. Scoresby Jackson's 'Note-Book' would be much enhanced by abandoning altogether in any future edition such an attempt, and by developing the pharmacology and therapeutics so as to render the work indispensable not only to the medical student but to the medical profession. The entire re-writing of Part I., the total excision of such articles as the loofah and vegetable marrow, of such drugs as *Sium nudiflorum*, *S. latifolium*, *Imperatoria obstrathum*, *Eryngium aquaticum*, and

a host of others, the free application of the pruning knife to the whole of the materia medica proper, both inorganic and organic, and the introduction of modern synthetic remedies in common use, such as, for instance, methylacetanilide, guaiacol, trional, tetroneal, chloralamide, etc., might be suggested as improvements for which there is pressing necessity.

BACTERIOLOGY IN ITS PRACTICAL ASPECTS.*

BY R. T. HEWLETT, M.D. LOND.,

Demonstrator of Bacteriology in King's College, London.

(Concluded from page 820.)

As a further development of the bacteriological diagnosis of tuberculosis the inoculation method may be referred to. Cases occasionally arise in which a correct diagnosis may be of importance, but in which no tubercle bacilli can be found on microscopical examination, as in suspected tubercular disease of the kidney. In such an instance, if a guinea-pig be inoculated in the thigh with some of the purulent deposit of the urine, infection with enlargement of the popliteal and inguinal glands will be evident in a fortnight if the case be tubercular.

By the inoculation method very definite information is obtained, and negative results are of almost as much value as positive ones, considering what a terrible scourge tuberculosis is, we ought to employ every available means to check its ravages. Unquestionably there is a risk, though perhaps a small one, of contagion from tubercular, especially phthisical cases, and the physician who neglects to warn a patient against disseminating his sputum has hardly done his duty. Tubercle bacilli have been met with in the air and dust of hospitals and rooms which have been occupied by tubercular cases, and I therefore agree with those who desire to place tuberculosis among the notifiable diseases and who would disinfect rooms which have been occupied by consumptives. In New York this is done.

It does not seem to be generally known that in the smegma preputii a bacillus is met in large numbers, which is very like the tubercle bacillus both in size and in staining reaction, and care should be taken to exclude it when examining urine for tubercle bacilli.

Actinomyces is a disease which often closely resembles tuberculosis, and it can be and can only be distinguished from it by microscopical examination. The recognition of actinomyces is of the greatest importance, for in some cases of the disease iodide of potassium acts as a specific. Although tuberculin as a remedial agent is not employed, it is regarded by the veterinary profession both here and abroad as a valuable aid in the diagnosis of early or doubtful cases of tuberculosis in cattle. For the diagnosis of the tubercular disease in man, tuberculin is, I think, hardly a justifiable agent to use, on account of the disturbance it sometimes produces. Analogous to tuberculin is mallein, which stands in the same relation to glanders that tuberculin does to tuberculosis.

* Read before the Harveian Society of London, November 1, 1894.

Mallein is prepared from pure cultivations of the glanders bacillus. The organism is grown in broth for about six weeks; the cultivation is then filtered through porous porcelain (a Chamberland filter, for instance), and the germ free filtrate put by in tubes and bottles and then carefully sterilised. If about 1 C.c. of mallein be injected into a healthy animal, nothing, or only a slight febrile reaction occurs, in the horse not exceeding about 102°, the normal being about 100°; but if glandered ever so little the temperature runs up to 105° or even 106°. At the seat of inoculation a large swelling appears, and any local lesions if present become much enlarged. Both in England and on the Continent the results obtained with mallein have been most successful; as a diagnostic agent it is practically infallible; it seems, however, to act but feebly as a curative agent, although a few cases of apparent cure after its use have been reported. Anthrax again is a disease which can be diagnosed with certainty by microscopical examination of the blood or spleen, or of the local lesion, the malignant pustule. To the practised eye, the anthrax bacillus is extremely characteristic, the shortish, non-motile, spore-less rods, which on staining are seen to be composed of 3-6 segments, can hardly be mistaken for anything else. At the same time the bacillus of malignant oedema, or the large septic bacilli which may make their appearance some hours after death, may be confused with anthrax by unskilled observers, and as a consequence some strange statements have been made from time to time.

Asiatic cholera is another disease in the diagnosis of which bacteriological examination is undoubtedly of great service. The Koch's comma bacillus is now universally recognised as bearing some relation to cholera, and it is the presence or absence of this organism which we rely on for diagnosis. In half the cases of cholera Koch's comma bacillus can be found on micro-examination of the rice-like flakes in the stools.

During an epidemic it would be impossible without a large staff to make the necessary bacteriological examinations in every case of diarrhoea; it would be wiser, perhaps, to treat every case of diarrhoea as cholera. The bacteriological diagnosis is of importance in distinguishing suspicious cases of diarrhoea which may occur at a time when infection is possible and an epidemic expected.

Diphtheria, too, is a disease in which the bacteriological diagnosis is coming to the fore. In New York this box of apparatus can be obtained at a large number of stations; on opening it you will see that it contains two tubes; one of these holds a small sterilised swab, the other is a tube of sterile blood serum. If you have a suspected case of diphtheria, you must rub the swab on the patch and then rub the inoculated swab over the surface of the blood serum. The tube is then placed in an incubator at 37° C., and in twelve hours, if the case be one of diphtheria, there will be numerous whitish colonies on the surface of the serum, and by microscopical examination the bacillus diphtheriae can be identified.

Then there is gonorrhoea; a microscopical examination of a doubtful urethral discharge may settle the

question whether this be gonorrhoeal or no. A little of the pus is smeared on a cover glass, dried, fixed by passing through the flame, and stained for ten minutes with Löffler's methylene blue, washed, dried, and mounted in Canada balsam, and examined with a 1/12" oil immersion. The gonococcus is very characteristic; it is a small coccoid form generally in twos, and grouped fifteen or twenty together in the pus cells. Gonorrhoea appears to be a specific affection dependent upon the gonococcus, and some German authors, Neisser to wit, go as far as to say that a urethral discharge is not infective unless the gonococcus be present in it, a proposition which will hardly, I think, be accepted by English observers.

Bacteriological examination and analysis of drinking water, if carried out with certain precautions, affords valuable indications, especially with regard to the efficiency of filtration and of filter beds. Considerable discussion has taken place as to whether sewer gas is really capable of producing disease. Most authorities are agreed, I think, that it is dangerous, and Sir George Johnson gives a long list of diseases which may occasionally arise through sewer gas poisoning—pleuro-pneumonia (hominis), diphtheria, enteric fever, albuminuria, diarrhoea, cholera, erysipelas, puerperal fever, etc.

To my mind there seems to be every probability that disease germs do find their way into sewer gas, but granting, for the sake of argument, that this is not the case, some experiments by Alessi point to danger in another direction. This observer placed a number of rats, rabbits, and guinea-pigs in cages with perforated bottoms communicating with a drain. After exposure to the sewer gas they were inoculated with a small quantity of a slightly virulent culture of the typhoid bacillus. Of forty-nine rats inoculated, after exposure thirty-seven died, while of forty-one control animals similarly inoculated, but kept under ordinary conditions, only three succumbed. Of seventy-two guinea-pigs inoculated after exposure to the foul air fifty-seven died, of the control animals not one. Every one of eleven rabbits similarly treated died, but not one of the control animals.

It was further noted that the animals were most susceptible to the typhoid infection during the first fortnight of exposure, the mortality being 90 per cent.; in the third week this fell to 70 per cent. These experiments seem to be very suggestive, and point to the conclusion that sewer gas may render the animal body highly susceptible to various disease conditions.

In conclusion, I would express the opinion that the practical applications of bacteriology, numerous as they are now, bid fair to be much extended in the future, and it is a matter for surprise, if not regret, that not even an elementary course of bacteriological training has been included in the five years' curriculum.—*Medical Press.*

AN UNUSUAL SOURCE OF LEAD-POISONING.

BY FRANCIS J. H. COUTTS, M.B., CH.B. (VICT.), F.O.S.,
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During my term of residence in the Manchester Royal Infirmary as house physician, a man (P. N.), twenty-seven years of age, was brought to the accident

room one day, as a case of acute intestinal obstruction, for immediate operation. As no very urgent symptoms were apparent, he was admitted to the medical wards, under Dr. Steell, to be under observation. The following morning the discovery of a very well-marked blue line on the gums cleared up the case, the diagnosis being lead-poisoning, with colic and constipation. The patient was pale, anemic, and rather nervous in manner; he complained of severe pain in the abdomen, chiefly referred to the umbilical region, relieved somewhat on pressure. There was a history of constipation for some days, but the bowels were moved on the day following admission.

The patient rapidly improved under the administration of potassium iodide; colic and constipation disappeared, and he left the Infirmary in nine days, feeling perfectly well. There were no signs of neuritis, except occasional feeling of pins and needles in the feet, and numbness and coldness of the hands on washing in cold water. Knee jerks and plantar reflex, wrist jerks, and triceps reaction were all readily obtained.

At first, no clue could be perceived as to the source of the lead in this case. The patient stated that he was a worker in a rubber factory, and questioning ultimately brought out the fact that he had been for some time in the habit of chewing portions of the soft unfinished rubber. He believed white lead and red lead were used in the process of manufacture of the rubber, but had not to handle these himself. He was asked to bring a specimen of the material he had been in the habit of chewing, and it turned out to be in the form of thin sheets of brownish-red rubber, about 1/16 inch thick.

On incinerating the rubber, much residue remained which, dissolved in nitric acid, gave very abundantly the characteristic reactions for lead. When opportunity offered, I made a more systematic examination, with the following results:—The specific gravity of the rubber was 1.647, whilst, according to 'Thorpe's Dictionary of Applied Chemistry,' the specific gravity of pure caoutchouc is 0.925. A piece of the rubber, 1 inch long and 3/4 inch wide, weighed about 13 grains, and on ignition and incineration left 51.55 per cent. of residue, consisting chiefly of sulphate and carbonate of lead, with iron, etc. Quantitative analysis revealed the presence of 23.57 per cent. of lead, calculated as metallic lead (Pb), which would correspond to 29.44 per cent. of white lead, calculated as $2\text{PbCO}_3 + \text{PbH}_2\text{O}_2$, or 27.62 per cent. red lead, calculated as Pb_2O_3 . This comparatively enormous quantity of lead would easily account for the symptoms of poisoning following the chewing of the rubber material. The patient was seen about twelve months after he left the Infirmary, and was then enjoying good health, but he still complained of weakness and cramps in his fingers after they had been in cold water.

I have to thank Dr. Steell for kind permission to report this case, which may be of some interest as pointing out a possible source of lead-poisoning which I believe has not been hitherto suspected.—*Medical Chronicle.*

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SCIENCE AND COOKERY.

THE world is at the mercy of its cooks, and has been so since the beginning of what Dr. THUDICHUM describes as the "long process of experimental empiricism, at which all mankind has laboured from the early days of its existence." Though few people care to be experimented upon, yet most voluntarily offer themselves for the purpose at more or less regular intervals during each day. The result to the victims is sometimes satisfactory, more often simply unobjectionable, but not uncommonly decidedly provoking. How could it be expected to be otherwise when one reflects that the knowledge acquired by cooks during countless ages yet exists for the most part in the form of unconnected recipes, and that these, even when collected and published in portly tomes, still preserve their distinguishing character of incoherency? A systematic attempt to express this acquired knowledge in the shape of general rules, described by the author as being such as would result from a codification of principles, is now presented to long-suffering humanity in *The Spirit of Cookery* (Baillière, Tindall and Cox). The task Dr. THUDICHUM has set himself therein is "to produce such a system of general rules as will enable those who thoroughly master them to perform the principal culinary operations without reference to the frequently unintelligible records of the details of mere empiricism. These rules are based, in the first place, upon unimpeachable scientific data or fundamental truths which admit of no circumvention or compromise, but have to be obeyed under pain of certain failure."

This, then, is most decidedly no mere book of recipes, and, in truth, definite recipes are but sparsely scattered throughout the volume. What has actually been produced, however, is a readable yet thoroughly scientific treatise on the history,

theory, practice, and ethical and medical import of the culinary art. At the beginning of the work a brief discourse on the evolution of cookery and its adaptation to various conditions paves the way to the statement of the hypothesis—that the state of culture of every nation can be estimated comparatively by its confectionery. The chapter concludes with a denunciation of the so-called economical practices indulged in by persons who are imbued with the delusive idea that good food can be prepared from "scraps costing nothing." A comprehensive sketch of the historic literature of cookery follows next in order, preceding chapters on kitchen requisites and culinary axioms, and general consideration of culinary processes. In these the hand of the chemist and physiologist are clearly indicated. Next, condiments and spices are grouped under the headings of saline, peppery, and aromatic substances respectively, parts of cruciferous and composite plants with sharp oil; aromatic herbs; acid condiments; odoriferous parts of plants (not aromatic); colouring matters; and varieties and preparations of sugar. The author then plunges bodily into his subject, and the mere enumeration of the subject-matter of his subsequent chapters, whilst of general and all-surpassing interest, would more than occupy the space allowed to describe the book in its entirety. Suffice it to say that everything receives proper attention—soups of every imaginable description; sauces and their philosophy; jellies, vegetables, salads, cakes, and puddings; joints, game, fowl, and fish; ices, jams, custards, and cheese; whilst the beverages discussed range from water, wine, beer, and spirits, to tea, coffee, chocolate, and tisanes.

In the concluding chapters—dealing with the cookery and meals of former generations, the philosophy of dinners and of dining, and the cookery of soldiers in the field—Dr. THUDICHUM displays a pleasing intimacy with that of which he writes, and it cannot be denied that he well fulfils the requirements he stipulates as necessary for authorship on the subject. These are a practical acquaintance with culinary processes, a good knowledge of physics and chemistry, intimacy with the historical literature of cookery of all times, a living knowledge—gained amongst the people of many lands—of all peculiar food-preparations, and the power of epitomising—after deep and very critical study—the works of previous authors. It is further significantly pointed out that the best treatises on cookery have been written by physicians. The writer of such a work certainly knows how to dine, and, knowing that, can furnish a satisfactory response to the question that will be first and last so long as mankind retains its capacity to think—"Is life worth living?" Those who would know the answer must needs refer to

the book itself, and consider the experience gained such as would be well earned at any cost. It is no exaggeration to say that, by the aid of Dr. THUDICHUM's book any person of average culture should be able to influence and direct his or her cook to the extent that all food prepared shall possess the necessary degree of refinement and digestibility. In conclusion, one cannot do better than quote what the author has to say respecting this refinement of food. After remarking that there are cynical persons who profess to despise the liking for good food (Fr., *friandise*), he proceeds as follows:—"The refinement of food is not only the efflux of culture, but also has an important influence upon the mind, and consequently upon the abilities and manners of man. 'Tell me what you eat, and I will tell you what you are,' is a paraphrase of a saying concerning the influence of company, and is equally true. Many persons mistake a natural, desirable daintiness for gluttony, *gloutonnerie*—as MONTAIGNE once termed it, 'La science de la gueule,' or 'The science of the gullet.' We hold absolutely with the 'gourmandise des esprits délicats'; if it cannot be satisfied, vitality is diminished, 'and life is shortened.'"

THE DANGERS OF COMPRESSED GASES.

THE result of the inquiry into the cause of the death of WILLIAM HOLBROOK, who was killed at Fenchurch Street Station by the bursting of a gas cylinder on March 15 (*ante*, p. 821), can only be described as vague and unsatisfactory. Evidence was given by Messrs. CLARKSON, who had filled the cylinder, to show that it was properly made, tested, and filled, and it was stated that great care was always taken to ascertain with what gas a cylinder had previously been filled before it was re-charged. For the purpose of displacement the same hydraulic pump was used for all gases, but it was urged that this was quite consistent with perfect security. Separate pumps were used for filling the cylinders with oxygen and hydrogen. Dr. DUPRÉ, chemical adviser to the Home Office, said that he had found the oxygen gas supplied by Messrs. CLARKSON of perfectly satisfactory quality, and there was no reason to suppose that grease was used at their premises to assist in removing the valve taps. He had reluctantly come to the conclusion, however, that the cylinder had contained an explosive gaseous mixture which had been fired by some portions of finely divided iron or grease igniting. The mixing of the gases was probably caused by the hydraulic pump. Dr. DUPRÉ also stated that the Home Secretary intended to take up the question of the conveyance of cylinders of compressed gas by rail, and said he had no doubt new legislation would shortly be introduced to deal with the subject. He was distinctly of opinion that there is no danger in cylinders of compressed gas, when the steel is good and the gas unmixed and pure. Finally, the jury returned a verdict of accidental death,

and recommended in a rider that all compressed gases of an explosive nature should be scheduled under the Explosives Act. Other recommendations were that all cylinders should be tested by the Government periodically; that they should not be allowed to be used or conveyed about unless bearing the Government stamp; that all manufacturers should be licensed by the Board of Trade; and that separate hydraulic pumps should be used in filling the cylinders. Moreover, it was suggested that a Railway and Board of Trade inquiry should be instituted. Since all the recommendations of practical value in the jury's rider, with regard to testing, filling, etc., appear according to Messrs. CLARKSON's account to have been anticipated, we can only repeat that the result is most inconclusive, and further inquiry into the cause and means of prevention of such accidents certainly appears to be called for. A practical suggestion mentioned in the *Daily News* is that every such cylinder should have a valve that would open automatically when the pressure reached a certain fixed point, which should be less than half the resisting power of the cylinder itself.

A POINT IN TRADE ETHICS.

A CURIOUS case under the Sale of Food and Drugs Act was briefly reported in last week's Journal (p. 882), and this week we are enabled to publish the magistrate's decision (see p. 906). Diluted acetic acid was asked for, and the purchaser was supplied with acid of the strength of 11·7 per cent., whereas *acidum aceticum dilutum*, B.P., should not contain more than 4·27 per cent. of real acetic acid. Mr. HORACE SMITH, in announcing his decision, remarked that there was no suggestion of fraud or gross carelessness, and, "as far as he could see, it would be well if tradesmen were to emulate the defendant's conduct, and give their customers, if possible, a better article than was demanded or paid for." Assuming that the magistrate is correctly reported, it may well be thought that he is unable to see very far, for if a chemist—as the defendant is described, though his name does not appear on the Register of Chemists and Druggists, with the address given—supplies an article of greater strength than a customer asks for, it is difficult to comprehend why he should be eulogised as a public benefactor. Whether or not there was any suggestion made to that effect, carelessness was unmistakably displayed, and that, equally from the medical, pharmaceutical, and public points of view, of the grossest type. A pharmacist would be much less culpable in supplying drugs and chemicals below the official standard than above it, but he is careless or dishonest in either case, since no practical difficulty need be experienced in supplying exactly what is ordered.

INTERNATIONAL EXHIBITION OF PRESERVED FOOD-STUFFS.

AN international exhibition of preserved food-stuffs will be held at Brussels, commencing May 6 next, when the proceedings will be inaugurated in the large hall of the *Marché de la Madeleine*, under the honorary presidency of the burgomaster, M. BULS. Full particulars of the regulations, prizes, etc., will be sent by M. LÉON PHILIPART, 9, rue Jules van Praet, Brussels.

Transactions of the Pharmaceutical Society of Great Britain.

FIRST EXAMINATION QUESTIONS.

April 9, 1895.

LATIN.

(Time allowed—11 a.m. to 12.30 p.m.)

I. For all candidates. Translate into Latin:—

1. The judge's daughters are very miserable.
2. We shall set out from Carthage.
3. Had your sisters been ordered to praise that boy?
4. He asked whether this was true or not.
5. Three hundred of us are prepared to conquer or die.

II. Translate into English either A (Caesar) or B (Virgil).

(Candidates must not attempt both authors.)

A. CAESAR.

1. Divico respondit: Ita Helvetios a majoribus suis institutos esse, uti obsides accipere, non dare, consuerint; ejus rei Populum Romanum esse testem. Hoc responso dato, discessit.

Postero die castra ex eo loco movent: idem facit Caesar; equitatumque omnem, ad numerum quatuor milium, quem ex omni Provincia et Aeduis atque eorum sociis coactum habebat, praemittit, qui videant, quas in partes hostes iter faciant.

2. Dum ea conquirantur et conferuntur, nocte intermissa, circiter hominum milia sex ejus pagi, qui Verbigenus appellatur, sive timore perterriti, ne, armis traditis, supplicio afficerentur, sive spe salutis inducti, quod, in tanta multitudine dedititiorum, suam fugam aut occultari, aut omnino ignorari posse existimarent, prima nocte ex castris Helvetiorum egressi, ad Rhenum finesque Germanorum contenderunt.

Grammatical Questions.

(For those only who take Caesar.)

1. Decline, in the plural, *ejus pagi*; and, in the singular, *tanta multitudo* (Passage 2).
2. Give the third person singular of the indicative perfect, and the third person plural of the subjunctive present, of all the verbs in Passage 1.
3. Account for the case of *testem*, *responso*, *loco*, *milium*, *eorum*, *partes* (Passage 1).
4. Write, in oratio recta:—"Ita Helvetios . . . esse testem" (Passage 1).

B. VIRGIL.

1. Aeolus haec contra: Tuus, o regina, quid optes, Explorare labor; mihi iussa, capessere fas est. Tu mihi quodcumque hoc regni, tu sceptrum Iovemque Concilias, tu das epulis accumbere divom, Nimborumque facis tempestatumque potentem. Haec ubi dicta, cavum conversa cuspide montem Impulit in latus; ac venti velut exmine facto, Qua data porta, ruunt et terras turbine perficiunt.

2. Obstipuit simul ipse, simul percussus Aechates Laetitiaque metuque; avidi coniungere dexteras Ardebant, sed res animos incognita turbat. Dissimulant et nube cava speculantur amicti, Quae fortuna viris, classem quo litere linquant, Quid veniant; cunctis nam lecti navibus ibant Orantes veniam, et templum clamore petebant.

Grammatical Questions.

(For those only who take Virgil.)

1. Decline, in the singular, *res incognita*; and in the plural, *cunctis navibus* (Passage 2).
2. Give the third person singular of the indicative perfect, and the third person plural of the subjunctive present, of all the verbs in Passage 1.
3. Account for the case of *haec*, *regina*, *mihi*, *cuspide*, *latus*, *exmine* (Passage 1).
4. Mention two prepositions which govern both the accusative and the ablative, and give sentences in illustration.

ARITHMETIC.

(Time allowed—12.30 p.m. to 2 p.m.)

[The working of these questions, as well as the answers, must be written out in full.]

1. If 81 gallons fill a cistern 4 ft. 4 in. by 2 ft. 8 in. by 1 ft. 1½ in., find the number of cubic inches in a pint.
2. If £32 8s. is paid for rent from July 10 to November 22, what should be paid from September 3 to October 28?
3. Simplify $\frac{015 \times 2 \cdot 1}{00035} \times \frac{3 \frac{1}{2} - 04}{5 - 0625} \div 63 \frac{1}{15}$.
4. What is the value of 89727 of £2 10s.?
5. Into how many pills of 325 milligrams each can a mass of 23·4 grammes be made?
6. A man spends 65 per cent. of his income, and saves £434. What is the amount of his income?
7. The difference between the incomes derived from investing a certain sum in 6 per cent. stock at 126 and in 9 per cent. stock at 210 is £22 10s. What is the amount invested?

ENGLISH.

(Time allowed—3 p.m. to 4.30 p.m.)

1. Analyse:—

"The hand that for my father fought,
I honour as his daughter ought."

2. Parse fully:—that, for, honour, as, ought.

3. Write short sentences, using the following words first as adverbs, and secondly as prepositions:—*in*, *down*.

4. In the following passage supply the necessary capital letters, and put in the stops and inverted commas where necessary:—capital i said as i entered now mrs seymour i want to borrow this boy for an hour why she asked because his grandfather is waiting to see him at my house oh then i am coming too she said at once my father shant have cyril without me i am resolved.

5. Give a short biography of some distinguished soldier or statesman of the present century, or an outline of the reign of one of the Tudor sovereigns. (*This must be attempted by every candidate.*)

EVENING MEETING IN EDINBURGH.

Friday, March 22, 1895.

MR. J. LAIDLAW EWING IN THE CHAIR.

(*Concluded from page 872.*)

WATERS.

BY W. S. GLASS.

There are sixteen waters in the B.P. Thirteen, including Aq. Dest., are prepared by distillation, two—camphor and chloroform—by solution in distilled water, and one, "Aqua" natural water, purest obtainable.

Aqua Destillata.—Under "Tests" for Aqua Dest. as for all other substances should be stated the impurity tested for. This would encourage the more frequent use of tests for purity and would make the Pharmacopœia a more intelligible book to juniors and apprentices. The new pharmacopœia ought also to contain a table of solubilities in water and other solvents—as spirit, glycerin, olive oil—of the more generally employed salts, oils, gases, &c., at ordinary temperature. This would serve as a ready reckoner, no less to the physician than to the pharmacist.

The B.P. methods of preparing the waters are defective in the case of anise, dill, caraway, fennel, and pimenta. 1. By not providing for previous maceration of the bruised dried fruits; 2. By not ordering distilled water; and 3. By excess of material for a saturated solution of the oil. Though "Aqua" of the B.P. may contain no visible impurities, still many invisible organic impurities may be there and will pass over in the first stage of the process of distilling these waters, and thus the distillate will contain such impurities. There is also no instruction given for preserving the aromatic waters, which should be stored in stoppered bottles, kept quite full.

Except in two cases, orange flower and cherry laurel, no characters and tests are given, and no doses prescribed except in camphor and chloroform. The B.P. methods should be abandoned and a more uniform process adopted. Tests and doses should be given and distilled water employed.

In some pharmacopœias the term *Aqua* has a somewhat wide application, and embraces solutions of ammonia and other like substances (see U.S.P.). The B.P., with one or two exceptions, chloroform and camphor, adheres to the definition of water as an aqueous saturated solution of essential oil. Camphor, although a steropten, is a natural product, is soluble in water, and resembles in its properties the essential oils. This leads us to ask how the pharmacist may best obtain a saturated solution to be equal, if not superior, to that obtained by the process of distillation, a process the pharmacist for want of space and on account of expense cannot adopt. It would not pay. Many methods have been proposed.

The U.S.P. method of dividing the oil by means of precipitated phosphate of calcium is not free from objection, for no substance is entirely insoluble in water. Other substances, as talc, silica, kaolin, magnesia, and chalk, are all objectionable for the same reason, and quite unnecessary besides. Percolation through cotton or pulp moistened with the oil is not always satisfactory, and alcohol is objectionable, as shown by Warrington in 1845, and other experimenters since, acetic acid being formed. The use of concentrated waters, which all contain alcohol is to be condemned.

Aqua Chloroformi is not a water, and ought to be removed. It should be placed among the liquors. It is not a solution of an essential oil, although largely employed as a vehicle for unpalatable medicines. *Aqua Laurocerasi* should be omitted because it is a dangerous water, on account of: 1. Its uncertain strength. 2. Its liability to chemical decomposition. 3. Its tendency to lose hydrocyanic acid and so become inert.

It is not desirable to multiply unnecessarily the B.P. preparations. The introduction of aqua caryophylli to displace aqua pimenta would be an advantage. It is difficult to distinguish waters made from ol. pimentæ and ol. caryoph. Ol. caryoph. is always at hand, whereas ol. pimentæ is never sold and is much dearer. Aqua caryophylli, might also take the place of infus. caryophylli, which is little else than a solution of the essential oil in boiling water.

The best method.—The distilled waters of the B.P., as officially prepared, frequently possess a rank, unpleasant odour, and do not keep well. Especially is this the case with sambuci, rosæ, and aurantii floræ, which produce on keeping fungoid growths. As some waters have to be kept for a length of time in the pharmacy before they are required, a demand has been created for concentrated waters which are said to keep better, and it is matter of common knowledge that these are employed in many instances just as concentrated infusions and decoctions are kept and used for the fresh article. Many chemists, no doubt, prepare the aromatic waters by simply shaking the essential oil with water, and these sometimes compare favourably with the official product. Waters are so frequently wanted that a method at once simple and satisfactory ought to be introduced into the new pharmacopœia. Various so-called simple methods appear from time to time in the journals, but the details and intricacies of most of these place them at once outside the region of practical pharmacy. The solution of essential oils in cold water is good, and in some cases, as in cloves and cinnamon, a fair water is obtained. I find that waters prepared with spirit have in most cases a harsh and sometimes, as with peppermint, caraway, dill, and cloves, a decidedly bitter taste. The best method is maceration in hot water with occasional agitation, and filtration when cold through a double fold of white well wetted filtering paper. I have prepared all the B.P. waters except cherry laurel and elder flower by this method, and compared the products with those obtained by maceration in cold water only,

also with cold water and spirit (known as the essence method), and also with those obtained by distillation, and I find that the hot water gives an article which is superior for full flavour and strength to that obtained by any of the other methods. I have for a year or two adopted the hot water process with peppermint, cinnamon, dill, and caraway, and the results have always been satisfactory. These waters possessed the full flavour and strength of the oil and kept well. A saturated solution is obtained, and any other method can give no more. The origin of the hot water process dates as far back as 1874 (see *American Journal of Pharmacy*), and has been advocated since then by Remington and Proctor. It commends itself for its simplicity, uniformity—all the waters being capable of preparation by this method—cheapness, and good results. Water at from 60° to 65° C. gives the best results. The finished product is clear and bright, and does not become turbid on keeping.

The strengths of all the waters ought to be uniform, 1 in 500, as in U.S.P. Notwithstanding the variation in solubility, this strength insures a saturated preparation.

The three waters which are prepared by distilling the flowers are generally imported. The keeping properties are a series objection to these. They soon become turbid, and numerous fungoid growths are frequently produced in them, and ultimately the fragrant odour gives place to a decidedly offensive one. *Aq. aurantii floris* is readily prepared from *ol. neroli*, *aqua rose* from the *otto*, and *aqua sambuci* from the essential oil. Thus prepared these waters have a finer aroma, keep well, and have the additional advantage of being prepared at once when wanted. These three waters should be termed "triple," and a dilute form of 1 to 2 of distilled water added. These latter are largely used for toilet purposes, and the dilute form would also be quite suitable as a flavouring agent in mixtures, etc.

The clumsy method of preparing *aqua camphore* should give way to a more rational process. Powdered camphor readily gives a saturated solution when hot water is employed.

The doses.—I do not think serious objections can be offered to uniformity in this matter. Half to two ounces is a suitable standard, and would apply to all except the three triple waters, elder, orange flower, and rose.

Characters and tests.—There is no reason why a general method of preparation should not be given once for all with the general characters, tests, and doses. The waters should all be clear and bright, possessing the odour of the oils from which they are prepared.

The tendency nowadays is toward simplicity and uniformity. The chemist, the student, and the physician call loudly for simplicity in method and uniformity in dose and strength; and one method, one strength, and one dose for all the waters of the Pharmacopœia would be a step in the right direction.

LINSEED MEAL.

BY ALEXANDER J. DEY.

There is evidently a pretty unanimous opinion that the cataplasmata should be excluded from the Pharmacopœia. That being so, it may be said that linseed meal should disappear also, but this does not follow. There can be no doubt that, so long as it is regarded as the most efficient material for that purpose, it will be prescribed by medical men for the making of poultices. For that reason there ought to be a definite standard of quality fixed in the new edition of the Pharmacopœia. What follows will show that there is great need for some means of securing uniformity, and so guiding the dispenser as to meet the requirements of the prescriber and the ordinary demands of the public. At present the Pharmacopœia gives no standard or test of any kind. It simply states that linseed meal should be "linseed reduced to powder," the state of division and the quality being left to the discretion of the chemist or grocer by whom it is sold. That there is a wide difference, even in appearance, may be easily seen from an examination of the eighteen samples placed on the table, ten of them having been purchased from grocers and eight from chemists. The grocers' samples especially show a decidedly inferior quality of meal; five are very dark in colour, and have the appearance of having been prepared from the ground oil-cake, to which a certain proportion of linseed oil has been added; four have been only very roughly crushed, and are similar to what is generally sold for feeding cattle; the remaining one is a sample of the powdered oil-cake formerly official in the 1867 Pharmacopœia. The chemists' samples are all, with one exception, of good quality as regards the percentage of oil. In appearance they vary in colour from a bright yellow to a dirty brown. With one exception the state of division corresponds to No. 20 powder, the exception being similar to some of the grocers' samples resembling cattle-feeding meal.

From the foregoing it is clear a necessity exists for inserting some definition and standard of purity in the Pharmacopœia. With a view to determine what tests might be suggested to secure uniformity, I examined the eight samples purchased from chemists for percentage of oil, freedom from cruciferous seeds, absence of starch, and percentage of ash. The results are as follows:—

Sample.	Percentages of		
	OIL.	Ash.	Sand.
1	41.0	3.700	0.546
2	43.5	4.306	0.308
3	33.5	2.476	0.133
4	21.5	3.827	0.494
5	40.5	2.223	0.214
6	34.5	4.907	0.812
7	32.0	3.481	0.514
8	38.0	1.882	0.282
9	49.0	3.450	0.240

No. 9 was powdered by myself from good seeds, and consists of the powdered seeds, with about 50 per

cent. of the testa or husk removed. Exclusive of No. 9 the samples show average percentage of oil 35.5, and of ash 3.35. The sand was got by treating the ash with hydrochloric acid. It consisted of distinct fragments of silica, evidently present among the seeds as an impurity. None of the samples gave any evidence of cruciferous seeds or starch. Nos. 4, 6, and 7 gave a markedly acid reaction with moistened litmus paper, indicating that the oil contained in them was considerably oxidised. Nos. 2, 5, and 7 are of a bright yellow colour. They seem to be artificially coloured, as, if a few grains are placed on white bibulous paper and saturated with chloroform, they impart a distinct yellow stain to the paper. The test sample No. 9, when similarly treated, gave no colour. The nature of the colouring matter has not yet been determined. It looks very like turmeric, but the presence of powdered turmeric would be detected by the starch test. The ash was colourless.

The U.S.P. requires that ground linseed or linseed meal should yield not less than 25 per cent. of oil, and should not be coloured blue by iodine test solution (absence of starch). The Belgian, French, and Italian pharmacopœias require it to contain 30 per cent. of oil. I would suggest that in the new pharmacopœia linseed meal should be defined as "linseed reduced to No. 20 powder," and should have appended to it the following:—

Characters and Tests.—A dark yellowish-grey powder; should be recently prepared and free from unpleasant or rancid odour. A decoction when cold does not become blue on the addition of solution of iodine (absence of starch); the meal does not give off a pungent odour when treated with warm water (absence of cruciferous seeds); when exhausted with carbon bisulphide should yield not less than 30 per cent. of oil; and when incinerated should yield not more than 6 per cent. of ash.

In the U.S. Dispensatory (page 788) it is stated that the percentage of ash should be less than 8 per cent. But this is too high, and in view of the foregoing determinations 6 per cent. gives ample allowance. I have to thank Mr. W. B. Cowie for kindly making the ash determinations.

Dr. TILLIE said he agreed very fully with the remarks made with reference to aconitine, veratrine, and atropine ointments. He had an especial objection to carbolic acid ointment, more especially as carbolic acid acted as a local anæsthetic, and hence sometimes caused considerable destruction of the tissue. Mr. BOA did not specially refer to the mercurial ointments. He thought two of these ought to be removed—ammoniated mercury ointment, which usually underwent decomposition, and mercurial ointments, made with ung. cetacei—as they often were liable to change colour. It was quite common for them to order for inflammation of the eye as a mercurial ointment yellow oxide of mercury. It would be much better to use paraffin as a basis if it were possible to get a perfectly bland preparation. With regard to the infusions, this was a point on which there was a little feeling. It was

quite common for a physician to write a prescription "infusion so and so"; it was equally common for a patient not to get it, interferences having taken place with the pharmacopœial instructions, the chemist and druggist having quite illegally and without any pharmacopœial authority dispensed something containing alcohol which ought not to be in the infusion as prescribed. Of course, one might put it down as a trade practice, which covered a multitude of sins. He thought it would be very proper to introduce "*Infusum so and so recens*" and "*Infusum so and so concentratum*," or something of that sort, to get over this little difficulty. But it was highly improper to dispense A for B, and the earliest possible step should be taken to put chemists and druggists on a legal footing in the dispensing of these preparations.

They should not dispense rectified spirit, a preparation which was not asked for, when there was no authority for doing so. He thought it would be a very excellent thing to have both fresh and concentrated infusions in the Pharmacopœia. He thought it was an advantage that infusions often rapidly underwent decomposition, because if there was any form of wickedness that patients were more addicted to than another it was in keeping bottles of medicine too long. When they thought they had got the same illness as they had last time they took the old bottle without quite realising what happened. The charm of the fresh infusion was that the mixture did not keep, and chemists and druggists often, by adding concentrated infusions which did keep, did themselves a great deal of harm, since the mixtures after being kept for a time could yet be taken, whereas if made with the fresh infusions they would go bad and have to be renewed. It ought to be clearly stated whether infusion of digitalis was to be made with the unbroken leaf or with the broken leaf, and the size of the broken leaf should be definitely stated. He did not know any preparations that one depended upon more than the infusion and tincture of digitalis, and there was nothing more important than making them with the most precise attention to details. He had a strong objection to the deletion of *pil. saponis co.* When one wanted to conceal from the patient that he was taking opium he knew no happier method than by prescribing *pil. saponis co.*

Dr. SILLAR said it seemed to him that to a very large extent the Pharmacopœia could be systematised. In one of the recent numbers of the *British Medical Journal*, a medical man, writing on the subject, remarked that it was very rare for medical men to have the Pharmacopœia in their library. He thought there were one or two very intelligible reasons for that. The majority of the copies of the British Pharmacopœia were used by the chemists and druggists. The Pharmacopœia was excellently arranged if they wanted to prepare a single specimen of a drug, but it was not good for any other purpose, and it was owing to this that he thought it was not used by prescribers. If it were properly systematised, great use might be made of it. He meant by that that the substances should be grouped together. As Mr. GLASS remarked with regard to the waters, the same thing ought to be carried out with every preparation. The Pharma-

copœia ought to be a text-book, and every student ought to have it as a text-book from which he was to work. It had impressed itself very much on his mind that the reason why so few of the infusions of the Pharmacopœia were prescribed was that as at present arranged no doct or knew what infusions were in the Pharmacopœia, because they were not arranged in any way in which he could learn them off by heart, and he got into a routine method of prescribing one or two infusions in certain cases. It also seemed to him that a great deal of attention was paid to the waste of the infusions. In that way it seemed to him that the chemist was very apt to work at cross purposes with the physician.

If the Pharmacopœia were printed in tabular form, in a certain systematised way, medical men could look for certain pieces of information in certain places. And what they required to do was to impress on medical men generally to have a very much more profound knowledge of the Pharmacopœia than they had. The greater the knowledge of the Pharmacopœia the physician had the easier it would be for the chemist and druggist. The first essential was that the name of the substances should always be defined, and when they once used a term they should keep to it. All their aim in medicine as the days and years went on was to be more and more nearly accurate, and they would like to substitute active principles for galenical preparations. He did not see any reason why, where it was possible, the physician's instructions and the processes set down should not be scrupulously adhered to in every case, even where they found it not to be most advantageous.

He did not see why the physiological tests of preparations of belladonna should not be one means of standardising these; but where the chemical method could be carried out it was preferable. One of the speakers remarked that certain other preparations might be classed under ointments. He would object to that because of the difficulty he found in teaching the subject, owing to the perplexity of giving a definition and there being an enormous number of exceptions. A great many remedies were being proposed to be struck out of the Pharmacopœia, owing, as he thought, to ignorance of their properties in the medical profession. Canella bark was an extremely useful substance because of its pleasant odour and its strong taste in covering certain disagreeable substances one wished to administer in the form of powders; but owing to the Pharmacopœia not being arranged in a definite form its properties were not so well known as they ought to be. Take also for example bael fruit, although it might not be largely prescribed in this country, from the north to the south of the great Indian Empire it was extensively employed as a remedy for dysentery. If the Pharmacopœia was to become an international Pharmacopœia, and apply to Britain and the colonies, not only bael fruit but a large number of other substances must be added for use in the colonies. This might be done by transferring to an appendix what might be struck out of the body of the Pharmacopœia. The solubilities in cold water should be more fully noted. It was owing to the want of knowledge of solubilities

that such a large number of incompatible prescriptions were written.

Mr. Dorr said, with reference to a recent statement by Dr. Lauder Brunton, that the Pharmacopœia should contain a table of solubilities and give information as to incompatibilities, that could only be done on a very limited scale. He seemed to wish that all possible accidents or incompatibilities that could arise in the mixing of various substances should be indicated, but that would be extremely difficult, and no table that could be devised would do so. There was one other point referred to by Dr. Lauder Brunton. He wanted to know how much of a substance dissolved in hot water would remain in solution when the liquid became cold. The answer to that was that under normal circumstances the same quantity of substance remained in solution when the liquid cooled as would be dissolved by water at the ordinary temperature of the air. In only two circumstances would this rule be departed from. Either when a strong hot solution was cooled at rest and produced a supersaturated solution which would deposit crystals on agitation or standing, or when the substance had undergone chemical decomposition by heat. Under all ordinary circumstances a solution made by cooling a hot saturated solution would be of the same strength as a saturated solution prepared with cold water.

On the motion of the Chairman, votes of thanks were awarded to the authors of papers.

The Assistant-Secretary then directed attention to some recent additions to the Museum and Library and on the motion of the Chairman, a vote of thanks to the donors was unanimously passed.

The meeting then closed.

Proceedings of Societies in London.

ROYAL INSTITUTION OF GREAT BRITAIN.

Lord Rayleigh's lecture on "Argon," on the 5th inst., naturally proved a great attraction, and the lecture theatre was crowded half an hour before the commencement, the audience including Mr. A. J. Balfour, M.P., Sir Frederick Abel, Sir Henry Roscoe, M.P., Professors Dewar, Rücker, Ramsay, and Roberts-Austen.

The lecture resolved itself into a popularised version of the communication read before the Royal Society on January 31 (*ante*, p. 676), but several facts of additional interest were disclosed, and various methods for the preparation of argon experimentally described.

At the outset Lord Rayleigh referred to the lecture which he gave some four or five years ago on the densities of oxygen and hydrogen gases, and the conclusions drawn therefrom, and described the experiments which caused him to suspect the presence of another constituent in the atmosphere. In the first of these—a process intro-

duced by Professor Vernon Harcourt—air was bubbled through liquid ammonia, the relative weight of the nitrogen so obtained being noted. After concordant results had been obtained, nitrogen was prepared by the ordinary process in which air is passed over red hot copper, when copper oxide is formed, and it was noticed that the relative weight of the gas so liberated was 1/1000 part more than the mean of that prepared by the first process. This was three years ago, and the discrepancy troubled him a good deal, various theories being advanced to explain it. The most useful suggestion was one made by *Nature* to the effect that, by the first process partial dissociation of the nitrogen from the ammonia had taken place.

If that were true the discrepancy was explained at once, but the theory was discredited—first, by storing a sample of chemically prepared nitrogen for several months, when no change occurred; and secondly, by the fact that the silent electric discharge had no sensible effect on nitrogen prepared by either process. Further, the difference between the relative weights of the two gases was confirmed by preparing "chemical" nitrogen by a variety of other processes, and by bubbling oxygen instead of air through the ammonia in Harcourt's process. Generally speaking, it was found that "chemical" nitrogen was $\frac{1}{2}$ per cent. lighter than "atmospheric" nitrogen. At this stage in the research he asked himself, "What evidence have we that the nitrogen of the air is all of the same kind?" and on setting this question to Professor Dewar, was referred by him to Cavendish's work. Lord Rayleigh referred in detail to that chemist's researches on the composition of the air, and showed the Wilmshurst's electrical machine which was employed for sparking mixtures of common air and dephlogisticated air (oxygen); at the same time pointing out how Cavendish to a great extent solved with his crude apparatus the question now raised after a lapse of more than a century. Indeed, he had himself used a modification of Cavendish's apparatus for the preparation of argon on the large scale. By this process, which he had adopted at Mr. Crookes' suggestion, alternating currents from the main of the Electric Supply Company—in connection with the Royal Institution—are passed through a Ruhmkorff's coil, high potential transformers being used, and thence through bent glass tubes, filled with mercury and fitted with platinum points, into a large glass globe in which are the mixed gases. Arrangements are made by which absorption by strong caustic alkali takes place after sparking, until the residue resists the prolonged action of the current; and the top of the globe is cooled by encircling it with a jacket of sheet lead through which a continuous current of cold water passes, thus forming an efficient condenser. It is essential that the platinum terminals should be very massive, so as to resist the enormous heat generated, and the collecting vessel must be made of glass. With this improved apparatus seven litres of the mixed gases can be absorbed per hour when present in about equal proportions, and passed in automatically. The other process for making large quantities of argon has been

perfected by Professor Ramsay, and consists in passing "atmospheric" nitrogen over red hot magnesium turnings contained in a combustion tube, when magnesium nitride is formed, the residue from the "atmospheric" nitrogen consisting of argon. The apparatus is necessarily rather complicated, but by its means argon can be obtained much more rapidly than by sparking; however, Lord Rayleigh rather prefers the latter method, as it does not entail such constant attention as the first. The gas prepared by either process is an exceedingly inert body, and it is supposed that the two products are identical. It has been found impossible as yet to produce argon free from nitrogen. It always contains at least $1\frac{1}{2}$ per cent. of nitrogen, which can readily be detected by the spectroscopic.

Since the reading of the communication before the Royal Society, several attempts had been made to induce argon to combine. Thus, no compound had been formed when exposed to the action of titanium at a red heat, although an inert body like nitrogen does. But during the last few weeks Berthelot has stated that by the action of the silent electric discharge it can be absorbed by the vapour of benzene; and so recently as the last few days Lord Rayleigh's son and Professor Meldola had tried to form a compound by sparking argon and acetylene together, when it was noticed that the volume of gas increased, although when acetylene alone was sparked no increase was observed.

Determinations of the solubility of argon in water show it to be the same as oxygen, and about two and a half times as much as nitrogen. These are of special importance as affording indications of good sources of argon on a large scale, owing to the much greater solubility of argon in water than nitrogen. In fact Lord Rayleigh had recently received from Manchester argon which had been obtained from the condensing water of steam engines. Turning to the spectrum of argon, allusion was made to the indebtedness of the speaker to Mr. Crookes for his work on the subject, and tubes of rarefied argon were shown, which, when illuminated by an electric discharge, were red or blue according to the character of the current employed. Spectroscopic examination had also been utilised in an attempt to distinguish between argon prepared by the alternating current method and that by the magnesium method, although no difference had been detected. A radiometer that Mr. Crookes had charged with argon during the last few days was shown, and when placed in the electric beam revolved rapidly. The density of argon prepared by magnesium had been carefully determined and fixed at 1.99, whilst that obtained by sparking was approximately 1.97. One of the most important properties of argon was the ratio of its specific heat at constant pressure and constant volume which we found to be 1.66, and hence approaching to the theoretical limit of 1.67. It is hence concluded that it has no energy, with the exception of that of the translation of its molecules, for if it had any other energy it would drop below 1.64, or even lower still. Upon the basis of the ratio of the specific heat of

argon has been founded the theory of the monatomicity of argon.

Lord Rayleigh, in his concluding remarks, devoted some attention to questions which naturally occurred concerning argon. He would have ignored the question as to argon being a new gas or not had he not seen that morning a suggestion advanced that it was merely nitrous oxide. Its presence in the air was, he thought, amply proved, both by the fact that otherwise the discrepancies would have been shown to be false ones, and that blank experiments only gave a small amount, comparatively, of argon, and the presence of this trace was no doubt due to the solubility of argon in water. Graham's method of atmolysis was described experimentally, and alluding to the suggestion put forward that argon is merely condensed nitrogen, it was shown that this theory was not likely to be tenable, as it was doubtful if it was consistent with the ratio of specific heats. In speaking of the nature of argon, Lord Rayleigh pointed out that neither he nor Professor Ramsay had ever suggested that it was an element until they read their paper before the Royal Society; and also that proving it to be an element was much like attempting to prove a negative. The question as to its being condensed nitrogen, represented by the formula N_2 , was a very interesting one, but as its density ought then to be 21 and it has already been shown to be barely 20, the hypothesis does not seem to be tenable. Even if N_2 did exist, chemists are by no means in unity as to its probable properties, as Mendeleef was of opinion that it would be explosive, whilst Professor Ramsay, on the other hand, says it would be non-explosive.

Correspondence.

THE MAJOR EXAMINATION.

Sir,—I think the suggestion of "M.F.C.S." (that it be made possible to pass the subjects of the Major examination one by one, they being placed successively to the credit of the candidate) a very unwise one. I should be indeed sorry to see so excellent and honourable an examination disintegrated and degraded into a paltry system of spasmodic and piece-meal cram. The subjects of the "Major" are so dependent one upon another, and all of them so closely related in their application to pharmacy, that their concurrent study is an absolute necessity; and to take up the subjects singly, at indefinite intervals, would certainly not tend to that thorough and more professional pharmaceutical knowledge which is the object of the Major examination. But if the suggestion of "M.F.C.S." be so unhappy, how irrational is that of "Verbasium," who expects the Council of the Society to "make concessions," that is, to provide a "modified Major" for those who have remained associates during a certain length of time, "as a mark of appreciation of their support." Can he really think that the Council will barter the qualification of pharmaceutical chemist to encourage the "support" of its associates? I offer these remarks not in any carping spirit, but because I am convinced that on reconsideration "M.F.C.S.," "Verbasium," and others, will determine to pass the Major as it now stands, and, if they be so determined, they will find that most of the obstacles they name will prove merely evanescent.

London, W.

HERBERT DYSON.

THE REVISION OF THE BRITISH PHARMACOPOEIA.

Sir,—Now so many able men are suggesting alterations in the coming B.P., I feel that such a humble member of the craft as myself ought to be silent; I nevertheless venture to propose that no galenicals be introduced into the B.P. that cannot be made in an ordinary well-equipped pharmacy, and that preparations be ignored that can only be made in a large factory; also that concentrated infusions be forbidden to be used in prescriptions, when infusions are ordered.

San Remo.

FRANK R. SQUIRE.

A CORRECTION.

Sir,—In your report of a discussion on a paper read to the Chemists' Assistants' Association, you say that I put in a word for the retention of the soap basis for some suppositories. This is hardly correct. What I did say was, that in view of the fact that this basis for suppositories is repeatedly prescribed by one of our most eminent surgeons, its deletion from the B.P. would not meet with the universal approval of the medical, though it did of the pharmaceutical, profession.

RALPH. MELHUISE.

THE REMUNERATION OF DISPENSERS.

Sir,—While you are interesting yourself on behalf of poor law dispensers, allow me to call your attention to the case of the dispensers to the London County Council, whose maximum salary has lately been reduced to £120.

"VERITAS."

* * Perhaps "Veritas" will favour us with further particulars than appear in his present brief communication [*Ed. Pharm. Journ.*].

Sir,—Having read your article on "Poor Law Dispensers," I should like to offer a few remarks in reference to the status and remuneration. I think it hardly explains that there are two classes of poor law dispensers, namely, one under the Local Government Board, the other solely under the guardians. This is where the evil steps in. The poor law dispensers' orders only refer to London dispensaries (Metropolitan Dispensers Orders, 1871), but in your article you draw no distinction. I was partly under the impression that the orders applied to the provinces until a friend put himself in communication, through a local member of Parliament, with Sir Walter Foster, who confirms what I have said, that there are two appointments for qualified men. If it were not so, under Art. 12 of the Poor Law Board Orders all would have to be qualified or they would not be sanctioned by the Local Government Board. This is where, in my opinion, the Pharmaceutical Society ought to step in. I think it is of great importance for the public safety that a public body should be compelled to employ a qualified man to dispense, in some cases as many as 1000 bottles per week, for if an unqualified man is caught selling a pennyworth of laudanum he has to pay the fine. If the Society urged the matter before the Local Government Board I think they would see the matter in a fair light, and they have the matter solely in their own hands. As regards the smaller unions not having sufficient work for a dispenser, I do not see why this should be an excuse for employing an unqualified man, but in most small unions the medical officers supply their own medicines, and it is allowed for in their salaries. As to the salary paid, I had not seen the report you mention fixing the commencing salary at £120, with a maximum of £140. In the Journal of August 18, 1894, a dispenser is adver-

tised for at £80 a year with dinner and tea; on January 27, 1894, one at £90, increasing to £100. This shows that the guardians are not bound by a minimum salary, and as regards the maximum I may say my own agreement goes beyond the £140.

Sheffield.

HERBERT ANTCLIFFE.

Sir,—The thanks of all dispensers in the public services are due to you for your sympathetic leader on "Poor Law Dispensers" in the Journal of March 30. I am a poor law dispenser of some years' standing, and am conversant with the efforts made by my fellow-dispensers to improve their position, which, for the information of others, it may be well to epitomise. Briefly, then, in the year 1886 a memorial was submitted to the Local Government Board, and in this attention was directed to the following points:—1st. That being specially qualified and responsible officials, we were aggrieved by the absence of any provision for increase of remuneration, except that granted after the first four years of service. 2nd. The detrimental effects both to the service and to ourselves from this cause, as after a certain time there is no inducement for dispensers to continue in their appointments. 3rd. That owing to the nature of our duties, no promotion, other than pecuniary, was applicable to us, and this was not possible while the present regulations obtained. 4th. That the knowledge gained by long service is invaluable in economically conducting the dispensary, and would, at least, partially compensate for any increase of salary awarded. 5th. That a provision, similar to that we desired, already applied to most other responsible officials in the service, e.g., the relieving officers, whose salaries rise periodically until fifteen years' service is attained.

We submitted a scheme which insured the dispenser a maximum salary of £200 per annum after sixteen years of service. The Local Government Board's reply stated that "they were unable to consider that they would be justified, under present circumstances, in making any alteration in the scale of remuneration for dispensers settled by them in the year 1886"; this being the one £20 rise recommended and referred to in their report for the year 1876, and is the only increase of salary obtainable. The present system of service satisfies neither the dispenser nor his immediate employers the guardians, several boards having unsuccessfully requested the Local Government Board to consent to an increase of salary for their dispenser after long service. Should the Local Government Board after a lapse of nine years now consent to the suggested extended scale, or any portion of it, adequate and efficient safeguards against abuse are provided, viz.: 1st. The proposed increments are dependent upon length of service. 2nd. It must be satisfactory service, or the local board of guardians will not recommend the official for the increase of salary. 3rd. It would probably have the effect of weeding out any unsatisfactory men in the service. There were no doubt weighty reasons which operated against the adoption by the local Government Board of a more extended provision for dispensers in the year 1876, the most cogent being, perhaps, that the class had been only four years in official existence, and that it was inadvisable to render permanent, as a scale would do, a body of officials, who, should the dispensaries prove a non-success, would subsequently have to be abolished, and whose extinction would involve compensation. The dispensary experiment has now been twenty-four years in vogue, and has thus long since passed

its probationary stage; a more adequate official recognition of the dispenser's services should therefore soon become evident, especially so as the position is regarded by the Local Government Board as "one of great importance."

"PAROCHIAL."

GRAINS AND MINIMS.

Sir,—I am much indebted to Mr. Naylor for drawing attention to the fact that in using the phrase "x grains in 100 minims" he intended "x" to mean an unknown number, and not "10," as I quoted it. This did not occur to me; had it been printed π , in the usual way, the misunderstanding would not likely have arisen. In view of this, my comments on the supposed high strength of the liquors are, of course, unnecessary; but with all deference I submit that the most important part of my criticism remains untouched. If a strength of "x grains in 100 minims" be adopted, the usefulness of the metric system will be entirely upset, no matter what the value of π may be. The relationship between the grain and the minim is such that formulae for preparations based on that relationship, and constructed on the metric system, would not be π grammes in 100 C.c., but π grammes in 91.1 C.c. or thereby. Now, this appears to me to be impracticable, and if the principle were adopted throughout the result would be "confusion worse confounded." This, at least, is my view of the proposal to introduce the metric system alongside of our present system, but altering grain measures to minims. If the times were ripe for such a change medical men should be invited to give up minims and drachms altogether, follow the B.P., and use only grain-measures; but, unfortunately, we cannot expect them to go this length yet awhile. In any case, the value of π should be the same whatever system we adopt; in the one it should be x grains in 100 grain measures, and in the other x grammes in 100 C.c.

Hawick.

THOS. MAREN.

Answers to Correspondents.

[Answers to queries, which are likely to prove of general interest, will be found under the heading NOTES AND QUERIES.]

"Pharmaceutical Chemist."—The point you mention has never been raised in a court of law, and it is not possible, therefore, to give a definite reply.

"001."—The precipitate formed is probably more or less analogous to the white precipitates obtained on adding ammonia, or potash in the presence of ammonium chloride, to solutions of mercuric chloride.

G. A. Thompson.—The Journal of the British Dental Association. Monthly, price 6d. Published by Ballier, Tindall, and Cox, 20 and 21, King William Street, Strand, W.C. The British Journal of Dental Science. Fortnightly, Price 6d. Published by J. P. Segg and Co., 229 and 291, Regent Street, W.

[For the information of several correspondents, whose communications arrived too late to be dealt with this week, it is necessary to point out that the present issue of the Journal is published a day earlier than usual.]

COMMUNICATIONS received from Messrs. Anstee, Bennett, Callis, Dakin, Greenish, Hill, Holmes, Johnston, Jones, Kirkby, Laing, Mair, Marshall, Melhuish, Parker, Proctor, Rideal, Simmonds, Stanton, Surfleet, Talbot, Thompson, and Wright.

EPITOME

OF

CURRENT EVENTS AND USEFUL INFORMATION.

Notes.

HELMHOLTZ'S VIEWS ON THE ATMOSPHERE.—A pathetic interest attaches to the letter recently received by Lord Rayleigh from the widow of Helmholtz. That profound and versatile thinker, though half paralysed during the last months of his life, yet maintained a keen interest in all scientific matters, and on hearing of the discovery of argon remarked, "I have always thought there was something more in the atmosphere."

'THE NATURAL HISTORY OF PLANTS.'—The twelfth part of the English edition of Kerner's 'Natural History of Plants' (Blackie and Son, Ltd.) opens with further information regarding the accessory structures of the fruits of Angiosperms. Those of Gymnosperms are next described in detail, after which fertilisation and the formation and natural protections of fruits receive attention. Consideration of the replacement of fruits by offshoots, parthenogenesis, heteromorphism, and alternation of generations conclude this section of the work. The portion of the next section included in this part deals with the nature of species and alteration in their form by various causes. Messrs. Blackie announce that there will be a slight delay in the publication of the next part, which will not appear until June.

ROYAL COMMISSION ON OPIUM.—It is stated, with considerable show of authority, as well as of probability, says the *Financial News*, that the long-delayed report of the Opium Commission will pronounce against any interference with the industry in India. The grounds of this conclusion, which is virtually unanimous, are that the alleged abuse of the drug has not been proved, and that to stop the manufacture of opium for purely sentimental reasons might entail serious social and political consequences as well as great financial derangement in India. The Commission further concludes that the cessation of imports from India would not affect the consumption of opium in China.

ROYAL GARDENS AT KEW.—The original Botanic Gardens, at Kew, of which Sir William Hooker was appointed Director in 1841, comprised about eleven acres. The following year between three and four acres was added, and in 1844, by permission of the Queen, forty-seven acres more. Further additions were made in 1846 and 1851, and at the present time the Royal Gardens are two hundred and fifty-one acres in extent. By permission of the Queen the meadow in front of Kew Palace is now to be thrown open so that visitors may obtain direct access to the finest part of the Arboretum.

PHARMACEUTICAL FELLOWSHIP.—A pharmaceutical fellowship of the annual value of six hundred dollars has been established at the University of Michigan, by Messrs. F. Stearns and Co., of Detroit, U.S.A., in accordance with the suggestion of Professor Patch at the Asheville meeting of the American Pharmaceutical Association.

AMMONIUM THIO-ACETATE.—A correspondent of the *Chemical News* states that on using ammonium thio-acetate in place of sulphuretted hydrogen, as recommended by Schiff and Tarugi, the precipitate of cadmium sulphide obtained was reddish instead of yellow, and might easily have been mistaken for antimony. Stannic salts, again, gave brown-black stannous sulphide instead of the usual yellow stannic sulphide. Finally, a tightly-stoppered flask containing about 100 C.c. of the reagent burst, presumably by the pressure of gas given off.

NEW NORWEGIAN PHARMACOPŒIA.—Considerable delay has been caused in the publication of the new edition of this book, on account of the enormous number of errors that have been found in the text. The Latin language is employed for the names of substances and directions for their preparation, but tests, etc., are given in Norwegian.

CO-OPERATIVE INDEXING OF SCIENTIFIC LITERATURE.—In March of last year the Royal Society sent out a circular letter to various institutions, suggesting that they should take part in the preparation of a complete catalogue of scientific literature, to commence with papers published on or before January 1, 1900. Amongst other bodies which received this was the Council of Harvard University, and the committee appointed by it to consider the matter reports that it finds itself fully in sympathy with the idea of establishing a catalogue of scientific literature, to be maintained through international co-operation. The opinion is expressed that some form of card catalogue can alone remedy the defects in all existing catalogues, and several suggestions are made with respect to the details of the plan proposed.

NITRO-CELLULOSE FILTERS.—In the *Chemical News* for April 5, H. N. Warren describes the preparation of filter papers by extracting them with hydrofluoric acid, drying thoroughly, then introducing them singly into a mixture of equal volumes of nitric acid (s. g. 1.5) and commercial oil of vitriol for five minutes, and finally washing free from acid upon a sheet of glass and dried. The result is a slightly hygroscopic paper, which burns almost instantaneously without residue, retains the finest precipitates, and yet filters much quicker than ordinary papers.

'THE EXTRA PHARMACOPŒIA.'—The eighth edition of this valuable work of reference has just been received at the moment of going to press. It contains 581 pages, i.e., 57 more than the previous edition, published in 1892. As usual, the matter is brought exceptionally well up to date, considering the emergencies of printing. A detailed reference to the work will appear in an early issue of the Journal.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

PLYMOUTH, DEVONPORT, STONEHOUSE, AND DISTRICT CHEMISTS' ASSOCIATION.—The first annual ball in connection with the junior section of the above Association was held at the Foresters' Hall, Plymouth, on Tuesday, the 2nd inst., and proved an unqualified success. About 100 ladies and gentlemen took part in the proceedings, and dancing commenced at 8 p.m., and kept up until 2 a.m. with great spirit. Great credit is due to the committee which arranged and successfully carried out the programme. Mr. H. O. Westcott acted as Hon. Sec. and Mr. E. W. H. Green as M.C. The music was rendered by Mr. Ackland's orchestra, and the handsomely got up programmes were a present from Messrs. Ford, Shapland and Co.

CAMBRIDGE PHARMACEUTICAL ASSOCIATION.—A meeting of the above was held on Friday, March 29, at the Technical Institute, East Road. Mr. Alderman Deak (President) was in the chair, and there was a very good attendance of members.

Mr. Shrubbs, Teacher of Botany at the Institute, gave a very interesting lecture on "How Plants Protect themselves." He first spoke of the struggle of plant life, followed that by the "Protection of Plants from Animals and Insects of various kinds, by means of Spines, Glands, and Hairs"; and the "Instinct of Plants" was also touched upon briefly.

The lecture was illustrated by various models, diagrams, and specimens, and at the conclusion the Chairman proposed a hearty vote of thanks to the lecturer, which was seconded by Mr. A. Sidney Campkin, and carried with applause.

SOCIETY OF ARTS.—The following are the papers to be read at the first four Wednesday meetings of the Society of Arts after Easter:—"The Use of Electricity for Cooking and Heating," by R. E. Crompton; "Deviations of the Compass," by Professor A. W. Reinold; "The Extraction of the Rarer Metals from their Oxides," by Professor William Chandler Roberts-Austen; "Means for Mitigating the Fading of Pigments," by Captain W. de W. Abney.

SELLING ACETIC ACID ABOVE STRENGTH.—At the Clerkenwell police-court, on April 5, Alfred Honman, chemist, of Upper Street, Islington, appeared in answer to the adjourned summons taken out by Sanitary Inspector Ward, of the Islington Vestry, for selling diluted acetic acid not of the nature and substance demanded by the purchaser. It will be remembered that the acid was stronger than the Pharmacopoeia standard, and that the magistrate took time to consider the point of law involved (*ante*, p. 882). Mr. Horace Smith now said the purchaser had obtained acetic acid which was partially diluted, but not so diluted as to be "diluted acetic acid" as described in the Pharmacopoeia. This preparation was, therefore, "not composed of ingredients in accordance with the demand of the purchaser, who received a stronger and more expensive dilution than he demanded. If he did not think himself bound by authority, he should say that the Food and Drugs Act was directed against adulteration, and not against such a mistake as the present. But in a case (*Knight v. Bowers*, 14 Q.B.D., 845) it was held that the Section applied to sales of unadulterated articles, but which, although pure,

were wholly different from the article demanded by the purchaser. In that case saffron was sold instead of saffron. It was not stated whether saffron was cheaper or dearer than saffron; so that it would appear that it was immaterial whether the article sold was better or worse, cheaper or dearer, than that demanded. It was said in the judgment of Mr. Justice Mathew that it was a "wholly different article." In the present case, at all events, the article was different from that demanded, and he was bound to convict the defendant. There was no suggestion either of fraud or even of gross carelessness, and, so far as he could see, it would be well if tradesmen were to emulate the defendant's conduct, and give their customers, if possible, a better article than was demanded or paid for. He should, therefore, inflict the nominal fine of 1s., and 2s. costs.

WEIGHTS AND MEASURES.—The London Chamber of Commerce has received the following letter on this subject from the London County Council:—"Spring Gardens, S.W., March 28, 1895.—Sir,—In reply to your letter of the 2nd inst. on the subject of the Bill promoted by your Chamber for legalising the use of metric weights and measures for export trade purposes, I have to inform you that the Council resolved at its meeting on Tuesday last, the 26th inst., to do all in its power to secure the passing of the Bill during the present Session. In the meantime I may say that no instructions have been given to the Council's inspectors to interfere with the use of metric weights and measures in the execution of foreign orders, nor is there any intention to issue such instructions.—I am, Sir, your obedient servant, (signed) H. DE LA HOOKE, Clerk of the Council."

THE DANGERS OF SOOTHING SYRUP.—At the adjourned inquest on Tuesday, March 26, respecting the death of the infant child of Alfred Price, of Wellington Street, Worcester, who had died after the administration of some soothing syrup, the public analyst for Northampton said that he had made an analysis of certain of the internal organs of the deceased, and found that there was a considerable quantity of morphine present, easily traceable in every part of the organs. He had also analysed what remained of the syrup, and had found that it contained one grain of morphine to the fluid ounce, thus giving one-eighth of a grain to the teaspoonful. The coroner produced an advertisement of the syrup, which stated that it contained but one-eighth of a grain of morphine to the ounce. Witness had read in cases in which two doses of the identical syrup (Winslow's) had proved fatal to a child of fifteen months.

The coroner, in summing up, pointed out that the analysis showed that the syrup contained eight times as much poison as stated, and a dose would equal in quantity one-sixth of a grain of morphine. A much less quantity had been known to cause death. It was a pity, he thought, that medicines should be sold containing so deadly a drug, and certainly that the public should have the liberty of buying them and giving them to children, who were particularly susceptible to such poisons. He thought it was time that something should be done, and that some caution should be adopted in the sale of such concoctions.

After a short deliberation, the jury returned a verdict of "Death from morphine poisoning," adding that they concurred in the coroner's remarks. They attached no blame to the parents, but to those who produced the syrup. They thought it was most dangerous to allow the unrestricted sale of such an article.

The coroner assured them that their views should be made known in the proper quarter.

SOCIETY OF CHEMICAL INDUSTRY.—The annual meeting of the Scottish branch of the Society of Chemical Industry was held on April 2, in the Philosophical Institution, Edinburgh—Mr. R. Irvine in the chair. Mr. J. Stanley Muir, the honorary local secretary, submitted his report for the year ending March last, which showed that the number of members on the roll at that time was two hundred and ninety, being an increase of ninety-five as compared with the previous year. Office-bearers were appointed as follows:—Chairman, Mr. John Clark; vice-president, Mr. J. B. Readman; honorary secretary and treasurer, Mr. J. Stanley Muir; members of committee—Messrs. G. Beilby, A. Macdonald, John Fyfe, D. Harris, G. Henderson, W. Young, Professor Iverson Macadam, J. S. Macarthur, E. Astlere, T. L. Patterson, R. Pullar, P. Rottenburg, H. Rose, E. C. C. Stanford, and D. R. Stewart.

THE MICROBE OF DEATH.—A terrible thing has happened in Chicago, says the *Pall Mall Gazette*. Dr. Wheeler, of that city, has discovered what he calls the "microbe of death," which can be destroyed "even as other microbes perish at the hands of the expert." "Expert Wheeler" little knows the mischief he has done to his own profession and to humanity. Think of poor Methuselah, who was occupied for two centuries in the attempt to attain his majority; who for the last hundred years of his life was toothless and confined to a diet of pap. The worst of it is that the County Council are certain to compel vaccination with the lymph of immortality. Thereafter nothing but a railway accident will serve to rid us of the burden of life. We shall become strug-for-deathers to a man. If insurance agents and undertakers unite in pressing their just claim for compensation, it will be a serious business for the Government. Who wants to be immortal, any way? No one, except the minor poet.

Obituary.

Notice has been received of the death of the following:—

On March 24, Mark Wynter, Chemist and Druggist, Seaford. (Aged 68.)

On March 31, Abraham King, Chemist and Druggist, Gravesend.

On March 31, Rowland Dickins, Chemist and Druggist, Aylesbury. (Aged 79.) Mr. Dickins commenced business at Kinsbury in 1844, and retired in 1886. He was one of the founders and the first secretary of the old Aylesbury Mechanic's Institute (now the Literary Institute), of which he was later elected Vice-president. Mr. Dickins was also President and the oldest Director of the Aylesbury Permanent Building Society. He was for many years, and until that body became extinct, a valued member of the Aylesbury Local Board, and for a less lengthy period a Guardian of the Poor for the parish. He also served for a long time on the Burial Board, was a member of the Monthly Board of the Bucks Infirmary, and one of the first trustees and managers of the British Schools.

On April 4, Robert Fitch, Chemist and Druggist, Norwich. (Aged 93.) Mr. Fitch commenced business at Norwich in 1827. He was an ardent archaeologist and geologist, and his valuable collections constitute an attractive feature of the galleries of the Castle Museum, Norwich, where they are gathered together in the "Fitch Room." He was Sheriff of the city in 1868 (when the British Association visited Norwich), and sat in the City Council for many years as Alderman.

Photographic Notes.

Infinitely Rapid Motions and Photography.—On Saturday, March 9, at the Royal Institution, Lord Rayleigh, in lecturing upon the multitudinous motions of the waves of the sea, and the forces which govern them in their phases, as revealed by the researches of Stokes, Thomson, himself, and others, spoke of waves upon the surface of water too small and rapid to be seen by the eye. These, he explained, can only be made visible, and apparently slowed down so as to be appreciated, by means of instantaneous photography, or by a series of instantaneous optical projections. Each flash of light, such as that of the electric spark, makes the object appear to stand still for a moment in one of its phases, and the flashes must be so timed as to reveal each phase so that they blend slowly, and the whole appears to be moving so slowly that the nature of the motion can be seen. He projected an enlarged image of a vibrating tuning fork upon the screen, and its prongs appeared fuzzy from the rapidity of the motion, but when the projection was performed by properly-timed flashes of light, he so slowed down the apparent motion that each prong appeared to make but one vibration in about two seconds, so that the nature of its motion could be seen with ease. He then projected upon the screen the photographs he took three years ago of bursting soap films, each taken by the light of an electric flash lasting less than one-millionth of a second. The soap films were broken by means of letting a bullet, wetted with alcohol, fall through them; a dry bullet would go clean through them, perhaps, a dozen times without breaking them. The greatest difficulty in the work was in the mechanical arrangements, to so time the flash that it should occur just as the bullet had passed through the film. The photographs were good ones, showing the falling bullet, and the torn and thickened edges of the broken film, as well as some little attached filaments of liquid beads of soap solution. —*Photography*.

Chromatic Colour Screens.—Macfarlane Anderson states that instead of the colour screens for the production of natural colours being a hoax, as termed in a late issue of *Process*, last year found him ruling colour screens, or more appropriate colour filters, with the primary colours, for use in the diaphragm slit, and for the purpose of securing colour work direct with one exposure. It has been pointed out that in obtaining colours by the Lippmann method, everything is endangered by the admission of white light to the sensitive plate. The experiments undertaken have had for their object the advancement of direct colour work, and the securing of true and faithful colour delineations with one exposure. Now, by the use of a colour filter of this description any coloured image impinging on the sensitive plate registers the true vibrations, or wave lengths, suitable for the obtaining of perfect colour delineations at one exposure. —*Photography*.

Standard Photographic Sizes.—The "whole-plate," the "half-plate" (more than half the size of a "whole-plate"), and the "quarter-plate" less than half the size of a "half-plate" had, we have been told, their origin in the days of the daguerrotype, the dimensions being those of the sizes of certain standard plates of copper. Whatever may be the origin of them, the fact remains that we have with us certain "standard photographic sizes," and further, that the existence of these standard sizes has been, and is, highly detrimental to photography as art, whether "decorative" or "fine." . . . There is a difference between standard sizes of plates and standard sizes of prints.

In the matter of plater, it is a question merely of convenience. The size of the plate ought not of necessity in any way to decide that of the print, but the mischief of the thing is that it does. Nine out of ten amateur photographers, apart from "carte-de-visite" and "cabinet" sizes, trim their prints as nearly to the size of the negatives from which they are taken as is practicable, with the result that the standard sizes of plates determines the dimensions of prints. . . . The modern custom of offering for sale sensitised papers of various kinds, ready cut to standard sizes, has undoubtedly had much to do with the evil of which we write. It cannot be too strongly impressed on the photographer that in prints there should be no standard size, nor should there be any attempt to fix a ratio of length to breadth. Each photograph should be treated on its own merits, and anything superfluous should be ruthlessly trimmed from top, bottom, or one side or the other. Although it would seem that, on the average, the length of pictures should be fully 50 per cent. greater than the breadth, it does not follow that every picture should be at least half again as long as it is broad. Indeed, there are a few subjects that are best treated by a square, or even a circular form.—W. K. B. in *Photography*.

Cloud Photographs.—Experimental photographers in France have been making numerous attempts lately to secure cloud photographs of a perfect character. In one case, it appears, there was employed a diaphragm with a very small perforation in front of the lens. A short exposure was made, this giving only a faint image at first, but a perceptible contrast, and then intensification was resorted to, though, by such an operation, there is stated to be a danger of ruining the plate. Another method resorted to has been to polarise with Nicol prism the light entering the camera, and in this way, we are told, the light from the clouds remains unaltered, while only part of the rays proceeding from the sky gain access to the plate.—*Invention*.

Direct Positives produced in the Camera.—In the *Phot.-Wochenblatt*, Herr Franz Kogelmann suggests the following modification of the Obernetter process of producing positives directly from nature in the camera. The plate, which should have been exposed for a much longer time than usual, is developed with ferrous oxalate until the high lights, if the plate be viewed from the back, appear quite black. The plate is then washed in the dark and placed in the following bath:—

Bichromate of potash.....	5 parts.
Alum	75 "
Nitric acid c.p.....	5 "
Sulphuric acid c.p.	10 "
Distilled water.....	800 "

This solution should be free from any trace of chloride. The plate is then thoroughly washed and developed in bright daylight with any good developer, until the required density is obtained. It is essential that in the high lights the silver salt is entirely reduced, so that it may be perfectly dissolved in the bichromate bath, leaving the corresponding parts of the film perfectly transparent.—*Scientific American*.

Publication Received.

GENERAL SURGERY AND PATHOLOGY FOR DENTISTS.
By EDMUND W. ROUGHTON, B.S., M.D. Lond.,
F.R.C.S. Eng. Pp. 134, with numerous original illustrations. London: J. P. Segg and Co., Regent Street. From the Publishers.

Poisoning Cases and Inquests.

Laudanum and Prussic Acid.—Emily Onger, a widow, died on Friday, March 29, at 3, Middle Street, Clothfair, City, from the effects of laudanum and prussic acid, self-administered.

Laudanum.—Martha Annie Pickering, a married woman, died on Wednesday, March 27, at Hemsworth, from the effects of an overdose of laudanum, self-administered. Verdict: "Death from an overdose of laudanum."

Vermin Killer.—Eliza Latimer, a married woman, died at Holloway Road, Drottitch, from the effects of a vermin killer, self-administered. At the inquest held on Wednesday, April 3, a verdict of "Suicide whilst of unsound mind" was returned.

Strychnine and Arsenic.—George Dixon, aged 54, died on Wednesday, March 20, at Blackburn, from the effects of strychnine and arsenic contained in a mouse powder, self-administered. Verdict: "Deceased came by his death by taking poison, his mind being somewhat deranged by excessive drinking."

Chloral.—Thomas Clarkson Wakeling, an architect, died on Wednesday, April 3, at his residence, 1, Park Terrace, Merthyr, from the effects of chloral taken to produce sleep. Verdict: "Death by misadventure by taking an overdose of chloral."

Carbolic Acid.—Severin Holme, aged 45, a Norwegian, died on Friday, April 5, in the Royal Infirmary, Liverpool, from the effects of carbolic acid, self-administered. Verdict: "Suicide during temporary insanity."

Spirit of Salt.—Mrs. Leyson, aged about 60, died on Friday, April 5, at Argyle Street, Swansea, from the effects of spirit of salt, apparently taken in mistake for spirits.

Remedies Introduced in 1894.*

(Concluded from p. 887.)

- Forstite.*—Insect destroyer.
- Gallol.*—Aluminum gallate.—Astringent.
- Genetica.*—Proprietary remedy for gonorrhoea.
- Glycogelatin.*—Ointment base.
- Glycoline.*—A "petroleum oil" for use in atomisers.
- Guaiacolin.*—Proprietary emulsion of cod-liver oil.
- Hæmalbumin.*—Dietetic preparation containing the salts and albumoses of blood.
- Hæmoferrum.*—Preparation from blood.
- Ilodin.*—Proprietary cosmetic.
- Ingestol.*—Proprietary stomachic mixture.
- Iodocestin.*—Antiseptic.
- Iodoformin.*—Derivative of formaldehyde.—Antiseptic.
- Iodophenochloral.*—Mixture of equal parts iodine tincture, carbolic acid, and chloral hydrate.—Parasitical dermic.
- Iodsuccinimide.*—Succedaneum for iodoform.
- Jessanodino.*—Proprietary antiseptic and analgesic.
- Kaputine.*—Said to be coloured acetanilid.
- Katharine.*—Tetrachlormethane; carbon tetrachloride.
- Kephaline.*—Proprietary headache remedy.
- Klinol.*—Proprietary antipyretic and analgesic.
- Krepinum.*—Tincture Panama bark mixed with small quantities of aromatic oils.

* From the *American Medico-Surgical Bulletin*.

Kressapol.—Disinfectant.
Lactol.—Lacto-naphthol; lactic ether of beta naphthol.—Intestinal antiseptic.
Laotophenin.—Paralactophenetidin.—Substitute for phenacetin.
Liquor Anthracis Compositus.—Liquor anthracis simplex admixed with sulphur, resorcin and salicylic acid.—Antiseptic protective.
Liquor Anthracis Simplex.—A preparation of tar.—Protective.
Liquor Antisepticus, Volkmann.—Solution of thymol (1) in mixture of alcohol (10), glycerin (200), and water (100).
Listol.—"Compound of thymol and iodine."—Antiseptic.
Loretin.—Meta-iodo-ortho-öxy-quinoline-anasulphonic acid.—Antiseptic.
Lucilline.—A pure petroleum jelly.
Luperin.—Mixture of powdered gentian, columbo and quassia.—Remedy against dipsomania.
Lycolol.—Dipropylene-diamine.—Solvent of uric acid.
Lysidine.—Ethylene-di-ethenyl-diamine.—Uric acid solvent.
Malakin.—Salicyl-aldehyd-paraphenetidine.
Mercury and Potassium Hyposulphite.— $3\text{Hg}(\text{S}_2\text{O}_3)_2 + 5\text{K}_2\text{S}_2\text{O}_3$.—Specially adapted to subcutaneous injection.
Migrainin.—Citrate of antipyrine-caffeine. Anti-neuralgic.
Neurodin.—Acetyl-para-oxy-phenyl-urethane. Anti-neuralgic and nerve.
Nutrin.—Dietetic food, representing, according to the manufacturers, "the pure nutritious substance of meat."
Odontodol.—Mixture of cocaine hydrochlorate (1), cherry-laurel oil (1), tincture arnica (10), and solution ammonium acetate (20).—Dental anodyne.
Orchidin.—Prof. Poehl's testicular fluid.—Nervine.
Oxyacanthine.—Alkaloid from barberry bark.
Oxalin.—Mixture of calcium, magnesium, and iron sulphates, with caustic soda and magnesia.—Disinfectant.
Paeoline.—Proprietary stomachic.
Paraform.—Polymeric formic aldehyde.—Intestinal disinfectant.
Pelagin.—Solution of antipyrine, caffeine, and cocaine.—Seasickness remedy.
Phenatol.—Mixture of acetanilid, sodium carbonate, bicarbonate, and chloride, and caffeine.—Antipyretic and anodyne.
Philopaidia.—Proprietary diphtheria remedy.
Phonizin.—Carbon tetrachloride.—Succedaneum for benzoin.
Phospherrin.—Mixture of a solution of ferric chloride, phosphoric acid, and glycerin.
Pomegranine.—Alleged alkaloid from the rind of pomegranate fruit.—Local anæsthetic.
Pyretine.—Proprietary antipyretic and analgesic.
Resorbin.—Ointment base consisting of almond oil, wax, soap, and water.
Rhinosclerin.—Extract prepared (like tuberculin) from pure cultures of the rhinoscleroma bacilli.—Remedy against rhinoscleroma.
Salactol.—Sodium salicylacetate.—anti-diphtheritic.
Sal Anæstheticum.—Generic name for Schleich's mixtures of cocaine and morphine hydrochlorates, with or without codeine phosphate.
Salifebrin.—Salicylanilide; antifebrin salicylate [?].—Antipyretic and anodyne.
Salubrin.—Mixture of acetic acid anhydride (2 per cent.), acetic ether (25 per cent.), alcohol (50 per cent.), and water (23 per cent.).—Antiseptic and hæmostatic.

Salumin, Soluble.—Aluminum and ammonium salt-ylate.—Disinfecting astringent.
Sapocresol.—Disinfectant.
Scopolamine Hydrobromate.—Salt of an alkaloid from *Scopolia atropoides*.—Mydriatic.
Sulphinol.—Mixture of borax, boric acid, and alkaline sulphites.—Antiseptic.
Spasmotin.—Spacelotoxin, poisonous element of ergot.—Oxytocic, like ergot.
Symphorol.—Formerly called "Nasrol." Generic name for the salts of caffeine-sulphonic acid. "L."—Lithium. "N."—Sodium. "S."—Strontium salt.—Diuretics.
Tannigen.—Acetyl-tannin.—Intestinal astringent.
Tannon.—Remedy against foot-and-mouth disease.
Terrolins.—Name of a special petroleum jelly.
Theolin.—"Distillate from an American species of pipe."—Substitute for benzene.
Thermodin.—Acetyl-ethoxy-phenyl-urethane.—Antipyretic.
Thermotaxine.—Proprietary analgesic and antipyretic.
Thiosapol.—Generic name of a group of soaps chemically combined with sulphur.
Thymenthol.—Proprietary antiseptic.
Thymoxone.—Proprietary antiseptic.
Traumatol.—Iodo-cresol.—Substitute for iodoform.
Trioresol.—Purified natural mixture of the three cresols of coal tar.—Antiseptic.
Tricresolamine.—Ethylenediamine.—Tricresol solution. Mixture of equal parts ethylenediamine and tricresol.—Antiseptic.
Triformol.—Paraformaldehyde.—Antiseptic.
Tussol.—Antipyrine amygdalate.—Whooping cough remedy.
Vaselon.—Solution of stearon and margaron in neutral mineral oil.—Ointment-base.
Vasogen.—Oxygenated vaselin. Sulpholeated mineral oil miscible with water. Absorbent vehicle.
Vasogenins.—Concentrated solutions in vasogen.
Vasogens.—Weak solutions in vasogen.

Technical Notes.

IMPROVING THE FLAVOUR OF BUTTER.—We have heretofore noted the experiments being conducted by Prof. H. C. Conn in the direction of discovering and cultivating the right bacteria for improving the flavour of butter. He has been at this work during the past two years, and his experiments have recently been made in the production of creamery butter. As a result of these trials, it is now stated that Prof. Conn has discovered a species of bacterium, to which he has given the insignificant name of "Bacillus No. 41," and which has given the most promising results, as an organism for the artificial ripening of cream in butter making. These experiments, as carried on by him, were thoroughly satisfactory, and were made in the following manner:—One half a pint of milk was sterilised, by incessant steaming, during a period of three or four days. Then this bacillus No. 41, which had been cultivated in the bacteriological laboratory of Wesleyan University, was inoculated into the milk, and for two days was allowed to develop. The large creamery at Cromwell, Conn., was then visited, and six to eight quarts of cream were put into a metal vessel and "pasteurised." The cream was then heated to 158° Fahr., and left for ten minutes. The vessel was removed and cooled quickly by means of cold water, and when the temperature had dropped to 80° bacillus No. 41 was poured in and the mixture stirred thoroughly. The vessel was then covered and put into the ripening room. After a couple of days the cream was churned, and the butter milk remaining was set aside for future use. These

six quarts were ripened for the purpose of increasing the number of bacteria, and securing a strong culture for use in the large cream vat of the creamery. The butter milk was then inoculated into the day's cream supply, and this cream allowed to ripen in regular time, at a warm temperature, and churned as usual. Before churning a quantity was set aside to use for inoculation in the next day's supply, and in this manner continued indefinitely. The effect was always uniform. The first six quarts of cream produced moderately good butter, but not quite of the flavour wanted. The first large churning was a trifle better, and each day's product was an improvement. A delicate flavour also developed, which seemed to deteriorate after two or three weeks. This deterioration was remedied by a fresh inoculation from the laboratory. Two vats of cream, from which June butter was made, were taken. One quantity was inoculated, and the other was not. The butter produced by each was of high quality, but that which had been inoculated with bacillus No. 41 had an aroma stronger and more pleasant than that without. It was also superior both in taste and odour. One lot was sent to a Mr. Beck, in Massachusetts, who makes the highest grade of butter, and who commands a very high price in the Boston market. Mr. Beck used the culture, and reported a decided improvement. It is the purpose of Prof. Conn to introduce this inoculation process in all the large creameries in the United States within the next year.—*Food and Sanitation.*

DETECTION OF NITRITES.—In the detection and determination of nitrites in drinking water by Tromsdorff's method of zinc-iodide starch, the presence of iron in the ferric state gives rise to considerable error, as ferric salts liberate iodine in much the same way as nitrites. H. Kral, to overcome this difficulty, has suggested the use of oxalic acid, by the addition of which the decomposition of the iodide by the ferric salts is prevented; but a safer method for the determination of nitrites in such waters is by Gress' method of naphthalamine and sulphanilic acid, which reagent is not affected by ferric compounds.—*Public Health.*

SILVERING MIRRORS.—MM. Lumiere Brothers find that an expeditious and, at the same time, a very simple and economical method of silvering mirrors is to utilise the well-known reducing properties possessed by "formalin," which, as pointed out some months ago in these pages, is a strong solution of formic aldehyde. They use a bath of ammoniacal silver nitrate, which, it is to be noted, should barely contain an excess of ammonia. To this is added quant. suff. of a solution containing 1 per cent. of formic aldehyde. The mixture is poured quickly over the clean glass plate so as to cover it immediately. In five minutes the deposition of the silver is complete, and the mirror can be washed and dried.—*Scientific American.*

STARCH IN COMPRESSED YEAST.—For the determination of starch in compressed yeast, a method has been devised by F. Filsinger, which perhaps is the most rapid for this purpose. Some twenty grammes of the sample of yeast is emulsified with 250 C.c. of water; an excess of a solution of potassium iodide is then added, when the heavy iodide of starch quickly settles down, and the milky liquid of yeast is rapidly siphoned off before it has time to do so, and the iodide of starch is then further washed with water, then collected on a filter and dried at 105° (which expels the iodine as well as the water) and weighed. Allowance has to be made in calculating the starch for the 10 per cent. of moisture usually present in

starch. The results obtained in test analyses have been very satisfactory.—*Public Health.*

HARDNESS OF WATER.—A new method of determining the hardness of water has been devised by F. Hundeshagen. He used a standard solution of sodium carbonate of 3.786 grammes to the litre, and dilute hydrochloric or nitric acid of equivalent strength; each C.c. equals 1 degree of temporary hardness (German scale). Two hundred C.c. of the water to be examined is titrated directly with the acid, using tincture of cochineal as an indicator. To estimate the permanent hardness an excess of the sodium carbonate solution is added to another 200 C.c. of the water; this evaporated to dryness, and heated to about 200°. The residue is now dissolved in a few C.c. of water, filtered, and the insoluble residue in the filter washed. The filtrate is then titrated with the acid. The number of C.c. of this acid deducted from the C.c. of soda added gives the permanent hardness.—*Public Health.*

DETERMINATION OF MILK FAT.—In the determination of milk fat by Soxhlet's areometric process, it is sometimes found that the ether separates from the alkaline solution very imperfectly, with the result that there is only small quantities to draw off. This difficulty can be easily overcome by first diluting the milk three or four times its volume with water, when the ethereal solution of fat separates out with the greatest ease.—*Public Health.*

Trade Marks Applied For.*

- No. 184,863.—"JOLLY'S, CALIFORNIA FRUIT PILLS" with device: A bowl of fruit and address of applicants.—Pills for human use made from California fruit.—Frederick Augustus Roe, 219, Oxford Street, London. December 19, 1894. The essential particular is the device.
- No. 184,457.—"EXCALIBUR" on a sword. Chemical substances prepared for use in medicine and pharmacy.—The Malto-Peptide Company, The Brewery, High Street, Needham Market, Suffolk. December 21, 1894.
- No. 186,093.—A MEDICINAL OINTMENT FOR MAN.—Robert Liddiard, 8, Marco Road, Hammersmith, London, W. March 9, 1895. Fac-simile signature of applicant.
- No. 185,604.—INSTRUMENTS, APPARATUS, AND CONTRIVANCES, NOT MEDICATED, FOR SURGICAL OR CURATIVE PURPOSES, OR IN RELATION TO THE HEALTH OF MEN OR ANIMALS.—Spiers and Pond, Limited, 38, New Bridge Street, London, E.C. February 14, 1895. Word, "Spierspon."
- No. 185,994.—ALL GOODS IN CLASS 42.—The Dyspepsia Cure Syndicate, 63, Austin Friars, London. March 5, 1895. Word, "Halurwine."
- No. 185,855.—A TOILET PREPARATION FOR THE PRODUCTION AND PRESERVATION OF THE HAIR.—William George Whyte, 64, Elm Row, Edinburgh. February 26, 1895. Word, "Venca."

Patent Office Business.

APPLICATIONS FOR PATENTS.†

Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 5658.—A portable apparatus for the production of distilled water. March 18, 1895.
- No. 5659.—An ointment for horses and other animals. March 18, 1895.
- No. 5702.—Improvements in photographic cameras. March 19, 1895.
- No. 5768.—Non-fillable bottles.* March 19, 1895.
- No. 5843.—Improved means applicable for use in the separation of solid matter from liquid. March 20, 1895.

* Compiled from the *Trade Marks Journal*.

† Compiled from the *Illustrated Official Journal (Patents)*.

- No. 5844.—Improved means applicable for use in the precipitation of metals from solutions containing insoluble matter in suspension. March 20, 1895.
- No. 5845.—Improved means applicable for use in separating solids from liquids. March 20, 1895.
- No. 5863.—Improvements in appliances for stoppering and opening bottles. March 20, 1895.
- No. 5865.—Improvements in and relating to apparatus for filtering liquids. March 20, 1895.
- No. 5919.—Improvements in or connected with photographic cameras. March 21, 1895.
- No. 5923.—Improved pharmaceutical powder or preparation for external application.* March 21, 1895.
- No. 5929.—Improvements in or relating to photography. March 21, 1895.
- No. 5966.—A method of producing direct positive photographic pictures, which may be mounted upon cards or other suitable supports, and which may be coloured or otherwise finished. March 22, 1895.
- No. 5992.—An improved hypodermic syringe.* March 22, 1895.
- No. 6017.—An improvement in sheaths for photographic plates. March 22, 1895.
- No. 6018.—Certain improvements in change boxes of photographic cameras. March 22, 1895.
- No. 6022.—Improvements in syringes or like surgical instruments.* March 22, 1895.
- No. 6028.—Improvements in and relating to apparatus for filtering liquids. March 22, 1895.
- No. 6084.—Improved cock or faucet for liquid-measuring apparatus. March 23, 1895.
- No. 6066.—Improvements in boxes or cases for matches, needles, pins, cachous, pills, and other like small articles. March 23, 1895.
- No. 6059.—Improvements in apparatus for filtering oils and the like.* March 23, 1895.
- No. 6079.—An improved bottle opener. March 23, 1895.
- No. 6087.—Improvements in or connected with magazine or hand photographic cameras. March 23, 1895.
- No. 6128.—A new or improved bottle washing and filling machine. March 25, 1895.
- No. 6150.—Improvements in or relating to focussing cloths for photographic uses. March 25, 1895.
- No. 6185.—Improvements in boxes or receptacles for automatically supplying tooth powder or the like. March 26, 1895.
- No. 6188.—A new and improved feeding-bottle, stopper, and glass suction tube. March 26, 1895.
- No. 6214.—Apparatus for ruling fine lines for use in colour photography. March 26, 1895.
- No. 6257.—A new or improved method of obtaining and preserving the soluble albumin of animal food. March 26, 1895.
- No. 6555.—Improvements in or relating to photographic blind shutters. March 30, 1895.
- No. 6591.—A filter for liquids. March 30, 1895.

PATENTS PUBLISHED APRIL 6, 1895.

Filtration (Boulton, A. J.; communicated by De Mol, P., and Wilbaux, A.).—Relates to a process and apparatus for filtering water for drinking purposes or for filtering acids, molasses, syrups, wine, vinegar, etc. Sponges, cotton wool and the hair of certain animals, all cleansed and sterilised and so dried as to have "a great affinity for water," are used in conjunction with wood charcoal "obtained by distillation with acids," and graphite or retort coke. The inventors state that the kind of hair (in the form of a felt) and of wood charcoal used, and the proportion existing between the latter and the graphite, must depend upon the nature of the liquid treated. No. 3414 of 1894.

Funnels (Hollis, W. J.).—The inside of the stem is traversed by a series of longitudinal grooves or flutings which are said to facilitate filtration. No. 5115 of 1894.

Sterilising Food, etc. (Bassfreund, J.).—The invention relates to an apparatus in which water, milk or other food for children, fruit, etc., may be sterilised, but a portion may be withdrawn when required without injury to the remainder. The cover of the bottle or other vessel is formed or fitted with a tube passing to the bottom of the vessel, and with an outlet tube or opening, or the

outlet may be in the body of the vessel. The contents are sterilised by steam passed in through the tube. Simple arrangements are provided for closing the tube and outlet after sterilisation. No. 5301 of 1894.

Disinfecting (Hermite, E. Paterson, E. J., and Cooper, O. F.).—For disinfecting closets, sink drains, etc., chlorine is produced from sea-water or other chloride solution by electrolysis. The salt solution passes from a reservoir, through a series of tubular or other vessels having zinc and platinum couples connected with the electric light mains or other electric supply, and finally emerges into the closet, etc. Automatic arrangements may be used to render the electrolysis and the supply of the disinfectant intermittent. No. 6487 of 1894.

Capsuling or Plating Bottles, etc. (Pichler, S. F.).—Relates to means for coating the tops of bottles, etc., the ends of cigars and cigarettes, photographs on glass, etc., with a film of metal. The article is coated with a mixture of liquid collodion and finely powdered aluminium, aluminium bronze, silver, gold, or other metal. The mixture is said to form, when dry, an air-tight and waterproof coating unacted upon by sulphuric and nitric acid, and specially suitable as a bottle capsule. No. 9261 of 1894.

Hernia trusses (Knowles, M.).—The body of the truss consists of a metal, celluloid or other frame, and the pad is adjustable by means of a clamp, but has a limited swivelling power, which allows it to conform to the movements of the wearer. No. 9460 of 1894.

Making alkaline sulphides (Peitzsch, B.).—A mixture of carbon with sulphate of potassium or sodium, or with the sulphates of sodium and magnesium obtained in "sulphating" the potash salts of Stassfurt, is heated in retort, muffle or other furnaces, with careful exclusion of air, at a temperature lower than the fusing point of the sulphide produced. Almost theoretical yields are said to be obtained, the sulphide being also free from polysulphides and "hypo-sulphides." No. 22,569 of 1894.

Ozone, etc. (Sleen, N. van der, and Schneller, A.).—Ozone is prepared from air or oxygen, or other gases are treated by means of the "dark electric discharge" in a series of discharge-vessels acting as usual, but alternating with cooling devices, by which the gas acted upon by the discharge in each vessel is cooled before being treated in the next. The inventor states that "any desired concentration of the ozone or other gas" may thus be effected. No. 23,297 of 1894.

Bottle stoppers (Mann, W. B., and Stilwell, W. T.).—The inside of the bottle neck is recessed, and the bottle is hermetically closed by forcing into the recess the edge of a cup-shaped, leaden, or other disc, which spreads at the edges when pressed downwards upon a shoulder forming the lower surface of the recess. No. 1530 of 1895.

Evaporating liquids (Cardozo, D. P. F.).—The liquid is contained in a series of trays arranged in tiers in a closed chamber and is evaporated by hot air, which enters below and escapes above after passing beneath and over each tray. The lowermost tray may be dispensed with, the bottom of the chamber being covered with the liquid and the flattened tube which admits the hot air passing through the liquid. No. 1956 of 1895.

Filters (Brandenburg, O. W., and Pott, F. H.).—The filtering fabric or surface is coated with a fine powder or "sludge" of finely-reduced carbon, sand, fossil meal, asbestos, etc., which has been sterilised by boiling in water and is evenly deposited by being poured into the filter while suspended in the water. Certain "salts" may be dissolved in the water to render subsidence less rapid. No. 2200 of 1895.

Sulphuric Acid (Waaker, L.).—This acid is well-known to be produced with precipitation of sulphur when a solution of sulphurous acid is electrolysed. The inventor employs a vessel with the anode and cathode preferably separated by a diaphragm, and introduces a slow stream of gaseous sulphurous acid into the anode division. Sulphuric acid forms at the anode and sulphur deposits at the cathode. The precipitation of the sulphur may be prevented by employing an oxidising agent such as chlorine water or the product obtained by the electrolysis of hydrochloric acid or common salt. The sulphurous acid is then supplied only in such quantity that the chlorine is always in excess. No. 3183 of 1895.

Notes and Queries.

[The Editor will be glad to receive for publication notes of practical interest to pharmacists, and will also endeavour to furnish suitable replies to any queries that may be sent by readers.]

GINGER-BEER PLANT.

[830.] The ginger-beer plant may be regarded as a very impure yeast or leaven, of a different character to ordinary brewer's yeast or German barm (cf. G. E. Davis, Manchester Microscopical Society's report, 1883-4). The cells are of various shapes, and are bound together by myceloid filaments which increase with the free access of air. The peculiar flavour imparted to the liquid has been attributed to small bacteroid cells.

SPICED PEPPER AND SALT.

[831.] Spiced pepper, according to Thudichum, is prepared by powdering, sifting, and mixing dried thyme leaves, $\frac{1}{4}$ oz.; dried marjoram, $\frac{1}{4}$ oz.; dried savory, $\frac{1}{4}$ oz.; nutmeg, $\frac{1}{4}$ oz.; cloves, $\frac{1}{4}$ oz.; whole black pepper, $\frac{1}{4}$ oz.; Nepaul pepper, $\frac{1}{4}$ oz. The mixture should be kept in a securely corked bottle. Spiced salt may be made by mixing spiced pepper, 1 oz. with salt, 4 oz.

DISPENSING CARBOLIC ACID.

[832.] The Cleveland Pharmaceutical Association (U.S.A.) has adopted the following formula, which is said to furnish a 33 p.c. solution of carbolic acid:—Carbolic acid crystals (U.S.P.), 16 troy oz.; glycerin, 40 troy oz. To make a 1 p.c. solution, one teaspoonful of this is directed to be mixed with 1 pint of water, and other solutions of definite percentage are easily calculated. The 33 p.c. acid mixes readily with water or alcohol in all proportions, and is much less dangerous to handle than the preparations usually supplied to the public.

THE BAKING OF BREAD.

[833.] The "ferment" added by bakers to dough made with flour consists of soluble starch, and is prepared by mixing boiled and mashed potatoes (the so-called "fruit") with yeast and some flour paste. On mixing this with flour and a sufficiency of water to produce the "sponge," the soluble starch is converted into sugar and fermentation ensues. The process is repeated when the sponge is mixed with the remainder of the flour and water to be used, and the third and final stage of panification takes place when, in the oven, the temperature of the dough approaches the point most favourable to diastatic action. The sugar formed is quickly destroyed by the yeast, and the result of the heat applied is to destroy all the ferments. The operation of bread making, therefore, involves the transformation of starchy and albuminous compounds by means of ferments, accompanied by the alcoholic fermentation of sugar and the evolution of carbon dioxide. Bread contains on an average about a third its weight of water. The starch in it is partly soluble and partly insoluble, and a little alcohol remaining in the loaves evaporates slowly on exposure.

COD LIVER OIL AS A TONIC.

[834.] A preparation containing extract of malt, $\frac{1}{4}$ oz.; pancreatised cod liver oil, 1 oz.; spirit of chloroform, 1 dr.; oil of cinnamon, 6 m.; and water to 6 oz. has been recommended by T. Robinson (*Lancet*) as a food in building up the organism and increasing the heat of the blood. Teaspoonful doses three times daily, after meals, are administered in cases of physical and mental depression, headaches from exhaustion, subnormal temperature, etc.

Novel Uses of Drugs.

[The notes given under this heading for the information of dispensers, embody recent suggestions in therapeutics, and cover both new remedies and old ones under new aspects.]

ANTIPIRYNE MANDELATE IN WHOOPING COUGH.—A combination of antipyrine and mandelic acid, found useful in cases of whooping cough. Infants under one year take 0.05 to 0.10 Gm.; between 3 and 5 years, 0.25 to 0.50 Gm. (Rahn, *Münch. med. Woch.*, Nov. 13, 1894).

ARSENIC IN EPITHELIOMA OF FACE.—Marsden's paste consists of arsenious acid, 2 dr.; powdered gum arabic, 1 dr.; cocaine hydrochlorate, 18 gr. Make into a paste with water, apply with a small piece of cloth, and leave on for 36 hours (J. A. Wyeth, *Inter. Journ. of Surg.*, Jan. 1895).

BROMALIN IN EPILEPSY.—As a substitute for inorganic bromides in epilepsy, up to 10 Gm. bromalin (bromethylformine) is given in 1 Gm. doses daily. For children dissolve 10 Gm. in distilled water 10 Gm., add syrup of bitter orange-peel, 90 Gm., and give a teaspoonful twice daily (Laquer, *Neurol. Cent.*, Jan. 1895).

COCAINE IN LABOUR AND IN NEURASTHENIA.—Freshly-prepared ointment of cocaine, 1 part, in anhydrous lanolin, 2 parts, is used to anoint the internal os in labour cases, after a douche of hot boric acid solution (G. H. R. Dabbs, *Brit. Med. Journ.*, Dec. 22, 1894). In neurasthenia, cocaine hydrochlorate, 0.02 Gm., mixed with vanilla sugar, 1 Gm., has been given two or three times daily in a glass of milk. Also, a small wine-glass of the following at the two principal meals:—Coca wine, 1 litre; tincture of nuxvomica, 25 to 50 Gm.; extract of quassia, 5 Gm. (Geley, *Journ. de Méd. et de Chir.*, Nov. 10, 1894).

GUAIACOL IN THROAT AFFECTIONS AND PHTHISIS.—Mixed with an equal quantity of glycerin for adults, and with twice the quantity for children, guaiacol has been recommended in throat affections in which diphtheria is absent, the affected parts to be painted four times daily (Darbousset, *Journ. de Méd. et de Chir. Prat.*, Jan. 10, 1895). Guaiacol has also been used externally in tuberculosis, 10 minims being applied over the seat of the greatest lesion of the lung, and brushed backwards and forwards until totally absorbed (J. Solis-Cohen, *Med. News*, Nov. 24, 1894). Guaiacol carbonate—2 to 8 Gm. daily in two doses, increasing gradually to 6 Gm.—is used in phthisis in preference to creosote or pure guaiacol because it does not disturb digestion (Hölscher, *Berlin Klin. Woch.*, Dec. 3, 1894).

POTASSIUM CYANIDE IN NEUROTIC DYSPEPSIA.—Divide potassium cyanide, 1 gr., and extract of valerian, 36 gr., into 12 capsules. Give one thrice daily, after food (J. P. C. Griffith, *Phil. Polyclinic*, Jan. 5, 1895).

SALAKTOL IN DIPHTHERIA.—A combination of hydrogen peroxide, sodium salicylate, and sodium laurate, to be applied with a penoil or given as an inhalation or gargle (Walle, *Deut. Med. Zeit.*, Nov. 15, 1894).

SULPHANILIC ACID IN CATARRH.—In cases of acute catarrh 40 to 80 Gm. daily of the following mixture has been found useful:—Sulphanilic acid, 10 Gm.; sodium bicarbonate, 8.5 Gm.; distilled water, 200 Gm. (Valentin, *Nouv. rev.*, Nov. 24, 1894).

TRAUMATICIN IN SYPHILIS.—Mix calomel, 25 Gm., with traumaticin, 75 Gm., and apply with a camel hair brush to the portions of body affected (Jullien, *Rev. Inter. de Théor. et de Pharm.*, Nov., 1894).

THE CYANO-CUPRIC TEST FOR DETERMINATION OF GLUCOSE.

BY A. W. GERRARD.

At the meeting of the British Pharmaceutical Conference held at Edinburgh, 1892, I communicated a paper on "A New Method for the Estimation of Grape Sugar," the details of which will be found in the 'Year-Book of Pharmacy,' 1892, p. 400; and *Pharm. Journ.* [3], xxiii, 208. In the discussion which followed it was feared that the reagent employed, if used as indicated, would not keep well. Such, after riper experience, has proved to be the case; notwithstanding this defect, however, further experiments have enabled me to so far modify the test as to make it as perfect as can be desired. The method is based on the following facts:—

If to a solution of copper sulphate a solution of cyanide of potassium is added until the blue colour is just gone, a double cyanide of copper and potassium is formed, as follows:—



This double cyanide is a salt of considerable stability. It is not decomposed by alkalis, sulphuretted hydrogen, or ammonium sulphide. With mineral acids it gives a whitish curdy precipitate. If in place of a solution of copper sulphate the cyanide be added to Fehling's solution, the blue colour vanishes and the same double cyanide is formed, but the product when boiled with reducing sugars gives no precipitate of cuprous oxide. If, however, the Fehling's solution be present to double the amount decolorised by the cyanide, the mixture will now be blue and suffer reduction when boiled with glucose, giving no precipitate of cuprous oxide, but a steady disappearance of blue colour; behaving in this respect like Pavy's solution.

In my original paper a formula was given in which Fehling's solution of double the usual copper strength was used, adding to it enough cyanide of potassium, of specified strength, to decolorise half the copper. This method, which proved troublesome, has now been discarded for the more simple and accurate one which follows:—10 C.c. of Fehling's solution, or 5 C.c. each of the separately kept solutions of copper and alkali, are placed in a porcelain dish with 40 C.c. of water, then boiled. To the hot mixture add steadily from a pipette some 5 per cent. solution of potassium cyanide until the blue colour just fades, or a very faint blue colour only remains. Excess of cyanide must be carefully avoided. A second 10 C.c. of the Fehling's solution is now added, and whilst the mixture is kept boiling run in the solution of urine or sugar from a burette, until the blue colour is gone. It is important to keep the mixture well boiling, to add the urine steadily, and watch sharply for the change. The volume of fluid in C.c. used to remove the colour will contain 0.50 gramme of glucose, so that if 10 C.c. be used the amount of sugar present is 5 per cent. Solutions containing above 5 per cent of sugar should be diluted ten times before testing; and the resulting figures multiplied by ten.

Those who are accustomed to frequently examine diabetic urines, are well aware of the difficulty of determining small amounts of sugar by Fehling's test, with anything like satisfaction.

The copper gets into an extremely fine and yellow coloured condition almost impossible to filter off, making it extremely difficult to judge of the end reaction. In such cases the cyano-cupric test will be found very useful. Further, it has the advantage over the ammonia test, in that there are no fumes to annoy the operator, and the boiling may be done in an open dish.

In working out this revised process, I am much indebted to Mr. A. H. Allen, of Sheffield, for his assistance. Mr. Allen fully confirms the simplicity, accuracy, and convenience of the test.

EXPERIMENTS WITH EGG ALBUMIN.

BY E. J. EVANS.

The following experiments were conducted in the laboratory of the University College of Wales, Aberystwyth, and were undertaken with the view of comparing the relative merits of the various tests for the detection of albumin.

Six tests were employed in each case, viz.: (1) heat test; (2) acetic acid; (3) nitric acid; (4) picric acid; (5) ammonium nitromolybdate; (6) uranium oxide dissolved in acetic acid.

(a) The strength of the first albumin solution was 1 in 40.

8 C.c.'s of this solution was dropped into each of six test tubes from a 50 C.c. burette.

The results were as follow:—

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|---|---|
| 1. Heated to boiling. | Coagulation and slight opalescence was observed. |
| 2. Heated with the addition of a few drops acetic acid. | Coagulation and more opalescence. |
| 3. Heated with a few drops of nitric acid added. | Formation of a cloudy precipitate, which became denser on heating. |
| 4. Addition of picric acid solution. | Bulky yellow precipitate soluble in ammonia, added in excess. |
| 5. Addition of solution of nitro-ammonium molybdate. | White precipitate, separating in flocks when heated. Soluble in ammonia, but not when heated. |
| 6. Addition of uranium acetate test. | Yellowish-white precipitate, curdy when heated. |

(b) A second solution was then prepared containing 1 in 200—

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|--|--|
| 1. Heated to boiling. | Formation of white froth on the top of the solution. |
| 2. Heated with a few drops of acetic acid. | As above, with slight coagulation. |
| 3. Nitric acid test. | A white, cloudy precipitate in the line of the drops of HNO_3 , and on shaking a white opalescence. |
| 4. Picric acid test. | Yellow opalescence more distinct than No. 3. On heating after standing some time, yellowish precipitate separates out. |
| 5. Molybdic test. | White, cloudy opalescence in the cold. On heating, a white, curdy precipitate separates out in flocks. |
| 6. Uranium test. | Yellowish-white opalescence. Yellowish-white precipitate separates out on heating. |

(c) The third solution contained 1 in 1000.

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|---------------|-------------------------------|
| 1. Heat test. | Slight froth; no opalescence. |
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|----------------------|--|
| 2. Acetic acid test. | Same. |
| 3. Nitric acid test. | Same. |
| 4. Picric acid test. | Slight yellow opalescence, increased by heating. |
| 5. Molybdic test. | White opalescence. On standing some time separates out in white flocks. |
| 6. Uranium test. | Yellowish opalescence, becoming curdy on standing and settling down as a white precipitate at the bottom of test tube. |

(d) A fourth solution was made one half the strength of the third solution.

The same reactions were obtained with (4), (5), and (6), but less definite.

The limits of these tests seem to lie between 1/2500 and 1/5000, and it is hard to decide which of the three is the most delicate.

My own opinion is in favour of the molybdic, next comes the uranium, and then the picric.

NOTES ON PEPSIN TESTING.*

BY L. A. HARDING, B.S.C., PH.D.

It has always been claimed that pepsin possessed great digestive power, and we have been taught that its proteolytic action was practically the only criterion of its value, yet from recent observation we are forced to admit that the real proteolytic action of pepsin is but very small, and it appears questionable as to how far we can admit this digestive property.

We say such and such a pepsin has a digestive power of, say, 1 to 2000 or 1 to 4000, as the case may be, and we understand by this that one grain of pepsin is capable of digesting or dissolving 2000 or 4000 grains of hard boiled egg albumin under certain conditions. These conditions we usually admit to be a sufficient quantity of a 0.2 per cent. solution of absolute hydrochloric acid and a water bath digestion of five or six hours at a temperature of between 100° and 105° F., and by the result of this operation we are taught to gauge the comparative value of a pepsin. It is perhaps the only practical method which we at present can employ to ascertain the real proteolytic power of a pepsin, but this method of procedure and the result obtained are unquestionably erroneous. Our best workers in this line have long since recognised this fact and have advocated the idea of measuring the value of a pepsin by the amount of peptone it is capable of producing and not by the quantity of albumin digested, for if we consider the fact that 2 ounces of a 0.2 per cent. solution of absolute hydrochloric acid, under the conditions mentioned above, can digest 126 grains of albumin out of 200 employed, being at the rate of 63 per cent., it is obvious that the pepsin must play but a very small part in the digestion of the albumin.

ALBUMIN SOLUBLE IN HYDROCHLORIC ACID ALONE.

The idea of coagulated egg albumin being soluble in an acid solution without the aid of pepsin has been contemned by some writers upon this subject, and especially by Dr. Tscheppe, whose conclusions are based upon the idea that owing to the natural alkalinity of the egg albumin a portion of it escapes

coagulation by transformation into alkali-albumin, and that the solubility is due to this phenomenon.

It seems scarcely probable, however, that 63 per cent. of the egg albumin should be converted into alkali-albumin. Furthermore, this view seems strangely in opposition to that of Prof. Harnack, of Halle, who claims to have isolated pure albumin, and who has stated that it would not coagulate by heat except in the presence of alkalies. The fact, nevertheless, still remains that if an acid solution can dissolve egg albumin without the aid of pepsin, it certainly can perform the same function with the addition of the pepsin. Dr. Tscheppe further maintains that if the floccular coagulum obtained from a strained solution of albumin by heat under addition of the proper amount of acid be thoroughly washed and then digested with a 0.2 per cent. solution of hydrochloric acid at incubation temperature, it would be found that not enough can be dissolved after twelve hours to yield a reaction with iodo-hydrargyrate of potassium.

While we do not question the correctness of this assertion, yet it is not stated that one grain of pepsin is able to digest 2500 grains of this so prepared egg albumin, and so long as we employ the egg albumin in a different form from that just mentioned, just so long must we consider the question in hand from that point of view.

HAS PEPSIN ANY REAL PROTEOLYTIC ACTION?

As mentioned before, from recent experience we must deny any real proteolytic power of pepsin upon egg albumin. This is the conclusion arrived at by working with pepsins having a claim of 1 to 2000 and 1 to 2500. What it would be with a pepsin of absolute purity we need not stop to consider, as pure pepsin, or the absolute active principle of the gastric ferment, has as yet not been isolated.

The results of my experiments may be summed up as follows, and I will state that a sufficient number of experiments has been made to confirm the correctness of the statement.

EXPERIMENTS.

First.—The pepsin employed was claimed by the manufacturers to be able to digest 1 to 2500. Acid solution employed, strength 0.2 per cent. absolute hydrochloric acid; time of digestion, six hours; temperature, 100° to 104° F.; average amount of albumin digested in five successive trials, 1540 grains.

Second.—Conditions and material the same as in the first instance cited, excepting that no pepsin was used: the quantity of albumin digested on an average of six successive trials being 1260 grains, leaving a difference in favour of the pepsin solution of 280 grains, or practically dissolving only about 9 per cent. of the amount claimed.

Now, the question might be asked, Why is it that you stated that pepsin was devoid of any digestive power, and yet you here admit that it digests about 9 per cent. of the albumin used? But I do not admit anything of the kind, as I account for the difference noted by the hypothesis that the pepsin converts part of the syntonin formed into a peptone, thus giving the remainder of the syntonin, if any more is formed, a chance to enter into solution, which could not be the

* Reprinted from the *American Druggist*.

case were the solution of syntonin already in a saturated state. The acid solution in this case converts the albumin into syntonin, from which it is converted into a peptone by action of the pepsin. This is the only credit that can be accorded to the pepsin.

THE STATE OF DILUTION.

Another important factor is the amount of acidulated water used. It must be borne in mind that no more should be used in testing the pepsins than is absolutely necessary. The proper proportion seems to be 1 ounce of acidulated water to 100 grains of albumin. Nearly all authorities, such as Clark, Hirsch, Schneider, Geisler, etc., agree on this amount of acid solution, and so long as we simply aim at the digestion of the albumin we should endeavour to ascertain what quantity of solution is necessary to dissolve a given quantity of albumin, and not what weight of albumin will be digested in an excessive quantity of water. Clark states (*Pharm. Journ. and Trans.*, January, 1892, p. 597) that the amount of acidulated water used is an important factor; as no limit can be given, to that extent the digestive power of the same pepsin will vary. Of course we have Geisler on the other hand, who recommended 100 C.c. of acidulated water for 10 grains (7 grammes) of albumin; but note, he also directed that the digestion be carried on only three hours. There are some who advise the use of nearly double the quantity of solution, but it should be borne in mind that if double the quantity of liquid is used this involves doubling the quantity of acid, and the result should be that double the quantity of pepsin is dissolved.

The whole matter of pepsin testing as practised at the present time is, it seems to me, only a delusion, for my claim that albumin is soluble in acid solution, without the aid of pepsin, is based upon actual facts, arrived at through actual work, and not jumped at simply through a baseless hypothesis. The time will come, and I believe it is near at hand, when we shall go a step further and gauge the value of a pepsin by the amount of peptone it is able to produce and not by the quantity of albumin there is dissolved in acid media of which it happens to be a part.

FLAVOURING EXTRACTS AND SYRUPS.*

BY GALEN, JUN.

EXTRACT OF VANILLA.

This is nothing more than a misnomer for tincture of vanilla, and if the pharmacopœial directions for the preparation of this article be followed a satisfactory article will result; but for the benefit of those who prefer to use a different preparation, we append the following formulae:—

Vanilla Essence I.

Vanillin crystals	5 drachms
Absolute alcohol	20 fl. ounces
Distilled water	15 fl. ounces

Dissolve the vanillin crystals in the alcohol and add the water.

The odour of vanilla is said to be obtained in great strength by the next formula:—

* Reprinted from the *American Druggist*.

Vanilla Essence II.

Musk	1 grain
Potassium carbonate	10 grains
Vanilla bean	1 ounce
Boiling water	4 ounces
Alcohol	12 ounces

Digest the vanilla, potash, and musk with the water in a covered vessel, and allow to stand till cold. Then add the alcohol, macerate for fourteen days, strain and filter.

Vanilla Essence III.

Vanilla bean (cut fine)	8 ounces
Deodorised alcohol	5 pints
Water	3 pints

Mix the liquids. Put one-third of the mixture in a suitable water bath apparatus with the cut beans. Cover closely and heat to not over 140° F. for one hour, and remove the heat. Drain off the liquid, add another third of the liquid, repeat the process, and again with the remaining portion of the liquid. Put the beans into a percolator, and having mixed $\frac{1}{3}$ pint of the liquid in the proportions given, percolate to remove the last traces of the extract from the beans.

Filter the mixed liquids and pour the percolate on the filter to remove the adherent extract.

SYRUP OF VANILLA.

Vanilla essence	fl. 3 iv
Solution of caramel	fl. 3 ij
Syrup containing gelatin 3iv—Cong. j. O. ij	

Mix well.

ORANGE ESSENCE.

Oil of orange (sweet)	fl. 3 ij
Alcohol	Oj
Water	fl. 3 j

Mix; allow to stand three days and filter.

ORANGE SYRUP I.

Orange essence (as above)	fl. 3 j
Solution citric acid (50 per cent.)	fl. 3 j
Tincture curcuma	q. s.
Simple syrup	Cong. j

ORANGE SYRUP II.

Take six good oranges and rub the oil from the rind by means of cut loaf sugar. After doing this the juice of the oranges is squeezed into about four or five pints of foamed stock syrup. The sugar used to extract the oil is placed in syrup and the whole heated gently to dissolve the sugar; then strain. If desired for blood-orange, colour with raspberry juice or tincture of cudbear. The rind will readily give up its oil to the sugar, then add foamed syrup to make one gallon. In case the oranges are unusually sweet acidify with citric.

ORANGE SYRUP III.

Oranges	No. vj
Tincture quillala	fl. 3 iv
Loaf sugar	3lxiv
Water, sufficient to make	Cong. j

Grate the oranges lightly and macerate the gratings in a quart or more of water; throw the whole on a flannel filter, then pass enough water through, when added to the orange juice, to make four pints; finally add this to the sugar contained in a conical percolator and dissolve by percolation. The tincture of quillala is added to the finished product.

ORANGE SYRUP IV.

Grate the outer peels of six large oranges and rub the gratings with 8 ounces of loaf sugar. To this add half gallon of syrup, stir thoroughly until the sugar is dissolved, and strain. Add the expressed juice of the

oranges and 1 fluid ounce of a 50 per cent. solution of citric acid to the strained solution, and, lastly, add sufficient syrup to bring the bulk up to 1 gallon, and use without foam.

BLOOD ORANGE.

Orange essence (as above)	fl. ʒij
Solution citric acid.....	fl. ʒij
Raspberry juice	fl. ʒviij
Simple syrup, to make	Cong. j.

Mix and strain through flannel.

LEMON SYRUP I.

Take two large, sound lemons; grate the peel and triturate with 2 ounces of sugar of milk and 1 pint of hot simple syrup. Shake thoroughly, and when cold add the expressed juice of the lemons, $\frac{1}{2}$ ounce of solution of citric acid (50 per cent.) and sufficient syrup to bring the total bulk up to 1 gallon.

LEMON SYRUP II.

Lemons.....	No. viij
Alcohol.....	fl. ʒiv
Solution citric acid	fl. ʒij
Loaf sugar	ʒclx
Water	O x
White of egg	No. viij

Grate the peel of lemons and extract the flavour with the alcohol. Express the juice, and after mixing both together, add the sugar and water, and dissolve by heat. When cool add the solution citric acid and white of egg. The white of egg should be beaten to a froth before adding to the syrup.

CHOCOLATE SYRUP I.

Powdered chocolate	ʒiv
Powdered cocoa	ʒij
Cold water.....	ʒxj
Simple syrup.....	Cong. j.

Mix the chocolate powders and make into a thin paste with the water. Heat the syrup to the boiling point and add the watery thin stream, stirring vigorously. Use without straining.

CHOCOLATE SYRUP II.

Powdered chocolate.....	ʒviij
Water	Oj
Vanilla essence	fl. ʒij
Simple syrup	Cong. j

Triturate the chocolate with sufficient hot water to form a smooth paste; then add the syrup and heat to the boiling point. When cool strain through cheese cloth and add the vanilla essence.

CREAM CHOCOLATE I.

Chocolate.....	ʒviij
Condensed milk.....	1 can
Loaf sugar.....	ʒlxxx
Vanilla essence.....	fl. ʒiss
Whites of egg.....	No. ij

Triturate the chocolate with sufficient water to form a paste and add to remainder of water in which has been dissolved the other ingredients.

CREAM CHOCOLATE II.

Chocolate	ʒlv
Cocoa.....	ʒij
Cold water.....	ʒxj

Mix and add:

Condensed milk	ʒxvj
Boric acid.....	ʒij
Stock foam syrup.....	Cong. j

Stir well; boil one minute, and use without straining.

COFFEE SYRUP I.

Mocha and Java coffee, of each.....	ʒviij
Put the mixed coffees in a percolator and add:	
Boiling water.....	Ovj

Allow the coffee to macerate about twelve hours before starting percolation; then percolate to five pints.

For hot soda add:

Sugar.....	ʒlxxx
------------	-------

For cold soda:

Sugar.....	ʒcxxxviij
Condensed milk	ʒxvj
Caramel solution.....	q. s.

COFFEE SYRUP II.

Fluid extract coffee.....	fl. ʒviij
Citric acid.....	ʒij
Syrup	Cong. j

Dissolve and mix.

RASPBERRY SYRUP.

Raspberry juice.....	Oij
Loaf sugar	ʒlvj

Dissolve the sugar in the juice with the aid of heat; strain and transfer to a bottle, labelled.

CONCENTRATED SYRUP.

To prepare for fountain use add one quart of this syrup to two quarts of simple syrup and three fluid drachms of solution of cochineal or a lesser amount of carmine solution.

SYRUP FOAM.

Gelatin makes one of the nicest and cleanest foams for soda syrup, the brand known as Cox's being excellent for this purpose. Gelatin foam has the advantage of ease of preparation and does not seem to interfere with the keeping qualities of the syrup, while the foam produced is all that could be desired. It has many points of superiority over soap bark or egg albumin. One-half ounce of gelatin to the gallon of syrup will usually be found sufficient.

THE SOLUBILITY OF QUININE IN ALKALIES.*

BY PROFESSOR E. DOUMER AND E. DERAUX.

Whilst carrying out some experiments in another direction we noticed that quinine was appreciably soluble in alkaline liquids, and the idea occurred to us to investigate quantitatively the importance of this solubility. This research is not without interest, for the precipitation of quinine by alkalies is frequently made use of not only in the manufacture of quinine commercially, but also in the laboratory for the determination of this alkaloid.

It has, of course, been known that quinine is not entirely insoluble in alkaline liquids, and in demonstrating that this solubility does exist we lay no claim to advancing a statement which is entirely new; on the other hand, it is the importance of this solubility, and the relation which the strength of the alkaline liquid bears to the amount dissolved, which has been neglected. The object of these investigations has been to determine the weights of quinine which can be dissolved by liquids containing known weights of alkalies.

It was hardly to be expected that in order to determine this solubility we could take an accurately weighed quantity of pure, dry quinine, saturate with

* From the *Journal de Pharmacie et de Chimie*.

it a known volume of an alkaline liquid, the strength of which had been very exactly determined, collect the quinine which was undissolved on a filter, wash, dry, and afterwards weigh it; indeed, by this process we should have multiplied the sources of error, some of which would have been sufficient to depreciate the value of our results. We have preferred another method of procedure which has this advantage over the foregoing, that it is first of all quicker, and in addition, only allows of one source of error. The process which we have employed is as follows:—Pure sulphate of quinine was dissolved in water which had been acidulated with just sufficient hydrochloric acid; this solution was added drop by drop to a known volume of an alkaline liquid, the strength of which had been very accurately determined, and this was constantly shaken. Proceeding thus, it is noticed that the quinine solution causes a precipitate which at first quickly redissolves in the alkaline liquid, but afterwards more and more slowly until the precipitate is permanent. If care has been taken to measure accurately the volume of the solution of quinine introduced into the alkaline liquid without producing a permanent precipitate, the weight of quinine dissolved in the volume of alkaline liquid used can be easily calculated.

This is the basis of the method which we have followed. Its accuracy, however, is not beyond criticism. Objections may be brought against it on the ground that the alkali of the solution forms salts with the acids of the quinine solution, whose solvent power on the quinine is perhaps not *nil*. But if it be noticed that the weight of sulphate of quinine, which must be introduced in order to obtain a permanent precipitate, is always relatively small, and that consequently the weight of the alkaline sulphate and hydrochlorate thus formed is almost negligible, it will be seen that this objection loses much of its value. Another objection, more important than the first, can perhaps be advanced. It may indeed be said that it is very hard to fix the exact moment when the precipitate is permanent; this, in fact, constitutes the greatest difficulty of the process. Practically this constitutes an insuperable objection to absolute determinations, but for comparative tests, analogous to those which we have carried out, in which we have confined ourselves to the regular use of the same volumes of alkaline liquid, it is of less moment so long as it is stipulated that each test is carried out under precisely the same conditions. Thus in all the following statements it is to be noted that we stopped at the moment when the alkaline liquid, kept constantly shaken, at the end of two minutes after the last addition of the quinine solution, had a milky appearance similar to that obtained by diluting 1 C.c. of milk with 100 C.c. of water. Thanks to these precautions, the results published in the following tables are sufficiently comparable with each other.

In all our experiments we have used a solution of sulphate of quinine containing exactly 1 gramme of sulphate of quinine in 100 C.c. of liquid.

AMMONIA.—In the following table the first column shows the weights of ammonia contained in 200 C.c. ;

the second, the volumes of the solution of quinine absorbed by the alkaline liquid; the third, the weights of anhydrous quinine absorbed; and the fourth the weight of quinine absorbed per gramme of ammonia.

Table I.

Weight of ammonia in 200 C.c.	Volume of solution of quinine absorbed.	Weight of anhydrous quinine absorbed.	Weight of quinine absorbed per gramme of ammonia.
0.52	11.3	0.084	0.163
0.65	11.3	0.084	0.129
0.86	11.3	0.084	0.098
4.59	13.0	0.096	0.021
13.08	16.3	0.122	0.009
18.88	19.5	0.144	0.008
25.19	23.5	0.174	0.007
35.79	26.0	0.184	0.006

The results shown by this table are first, that the weight of quinine dissolved increases in proportion to the strength of the alkaline solution, and that with a comparatively weak solution (containing, for instance, 2 per cent. of ammonia) the proportion of anhydrous quinine dissolved per 100 C.c. is far from being unimportant, since it corresponds to 0.048 gramme. This conclusion can therefore be drawn—that in the precipitation of quinine, it is best to use as little ammonia as possible. If we consider the figures contained in the last column we shall see that the weight of quinine absorbed, when referred to the unit of weight of ammonia, varies inversely as the strength of the alkaline liquid, and in an enormous ratio. Thus, since very weak ammoniacal solution will absorb 0.163 gramme of quinine per gramme of ammonia, a very concentrated solution will not absorb more than 0.006 gramme per gramme of ammonia. From this we conclude that it is best to use an ammoniacal solution as concentrated as possible.

To sum up, it is best to use a very small quantity of a very concentrated solution of ammonia in order to have as little loss as possible in precipitating the quinine.

Let us take for example the precipitation of 1 gramme of quinine as sulphate, dissolved in 100 C.c. of water. If this is precipitated with 100 C.c. of 25 per cent. ammonia we shall only recover, after precipitation, about 1 gramme less 0.17 gramme, that is to say, 0.83 gramme; if, on the contrary, we precipitate the same with a solution of ammonia of but 4 per cent. strength, but the same bulk of liquid, we shall recover an amount of quinine equal to 1 gramme less 0.08 gramme, that is to say, 0.92 gramme. From this it will be seen how important is the effect which the quantity of ammonia used has on the determination of quinine.

POTASH AND SODA.—Caustic potash and soda also dissolve quinine to an appreciable extent. But, as the following tables show, contrary to what is seen with ammonia, the solubility of quinine in potash and soda solutions is greater in proportion as the strength of these solutions is less. The potash and soda used was prepared by alcohol.

Table II.—Soda.

Weight of soda contained in 200 C.c.	Volume of solution of quinine absorbed.	Weight of anhydrous quinine absorbed.	Weight of quinine absorbed per gramme of soda.
0·007	12·4	0·092	13·143
0·012	12·3	0·091	7·583
0·740	12·2	0·090	0·122
2·160	10·6	0·079	0·037
3·188	7·5	0·056	0·018
6·172	5·9	0·044	0·007
8·537	2·8	0·021	0·002
17·074	2·0	0·015	0·001

Table III.—Potash.

Weight of potash contained in 200 C.c.	Volume of quinine solution absorbed.	Weight of anhydrous quinine absorbed.	Weight of quinine absorbed per gramme of potash.
0·612	11·9	0·088	0·144
1·512	11·0	0·082	0·054
3·456	9·2	0·068	0·020
10·944	5·3	0·039	0·004
44·704	0·8	0·006	0·0001

As may be seen, the solubility diminishes in proportion as the strength increases. It is true that it cannot be stated that this difference is essentially due to the nature of the alkalies; for although we can obtain very pure ammoniacal solutions, the case is not the same with potash and soda solutions, which, no matter how made, always contain variable proportions of carbonate, and it will subsequently be seen how important an influence this body exerts upon the solubility of quinine. However that may be, we can, from a practical point of view, draw this conclusion—that the precipitation of quinine by potash and soda will be more complete in proportion as the weight of alkali used is greater and dissolved in as small an amount of water as possible.

(To be continued.)

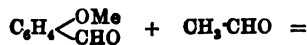
NOTES ON RECENT SCIENTIFIC INVESTIGATION.

CONSTITUENTS OF CASSIA OIL.—The existence of a crystalline "cassia-stearopten" in cassia oil was first noted by Roehleder in 1850, and Bertram and Kürsten (*Jour. für Prakt. Chem.*, II., 316) have separated and identified this substance. By the reactions of this substance they arrived at the conclusion that it was ortho-cumarylaldehyd-methyl-ether—



The aldehyde itself bears the same relation to salicylic acid that cinnamic aldehyde does to benzoic acid, and this conclusion has been verified by synthesis of the compound. The crystalline stearopten is freed from adhering oil by filtration with the air pump, and when recrystallised from dilute alcohol melts at 45°–46°, and

boils at 295° under the ordinary atmospheric pressure. Analyses showed that the formula of the compound was $\text{C}_{10}\text{H}_{10}\text{O}_2$, and the presence of the aldehyde group was proved by the formation of characteristic compounds with sodium bisulphite, phenylhydrazine and hydroxylamine. The presence of one methoxyl group was also proved by reduction with hydrogen iodide and estimation of the methyl iodide produced. When fused with alkalies salicylic acid was obtained, thus proving the presence of a benzene nucleus, and when oxidised by potassium permanganate the methyl ether of salicylic acid was formed. These reactions proved that the formula might be written $(\text{C}_6\text{H}_4)(\text{OMe})(\text{CHO})(\text{C}_2\text{H}_5)$, and there remained to be proved the nature of the group C_2H_5 . This was done by oxidising with silver oxide, when only the aldehyde group suffered oxidation, and β -methyl cumaric acid was obtained. The substance is then the aldehyde of this acid, and is $1,2\text{C}_6\text{H}_4(\text{OMe})(\text{CH:CH-CHO})$. The substance was prepared synthetically by a modification of Perkin's method, salicylaldehyde being treated with acetaldehyde and sodium hydrate, when condensation occurs and the ortho-cumarylaldehyd-methyl-ether being formed according to the equation—



The product thus obtained being identical in all respects with that obtained from cassia oil, the constitution of the stearopten is conclusively proved.

ACETYLATION OF SUGARS.—It has been shown that the sugars are easily transformed into their acetic esters by reaction either with acetic anhydride and sodium acetate (Liebermann), or with acetic anhydride and zinc chloride (Franchimont). Tanret (*Bull. Soc. Chim.*, xlii., 261) has studied the action of these different acetylating agents on various members of the sugar group. When inosite and other sugars not easily inverted react with these reagents, the action is the same in each case, both with regard to the ester formed and the yield. With saccharoses and polysaccharides easily inverted, such as saccharose, raffinose, etc., the true acetic esters of the sugar are formed by acetylation with acetic anhydride and sodium acetate. If, however, zinc chloride and acetic anhydride be used, esters are obtained which differ in rotatory power and other physical properties from those obtained by acetylation according to Liebermann's method. The esters thus obtained are those of the glucoses derived from the corresponding saccharose by hydration. The action then of these two acetylating agents differs with the saccharoses. When the two acetylating agents reacted with the glucoses, discordant results were obtained by different investigators. It appears however, that by varying the amount of sodium acetate and zinc chloride present, three different esters were obtained. The cause of these differences is still under investigation.

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Editorial Department.

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Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, — 17, Bloomsbury Square, London, W.C.

CONSUMPTION AND ITS PREVENTION.

THE prevention of disease is of even greater importance than its cure, since the necessary precautions concern everyone, whilst the invalided and those interested in their treatment constitute only a comparatively small number. And, though the realisation of the idealist's dream of the total extirpation of disease would seem to carry with it the removal of the occupation of medical men and pharmacists, in reality it would but tend to indefinitely extend their sphere of usefulness. For the more hygienic restrictions and regulations are multiplied, the greater will be the need of an army of well-trained experts, and the highly educated medical man and pharmacist will be the persons best adapted to fulfil the functions of such. No apology, therefore, is needed for introducing to our readers some of the facts and opinions recorded by Dr. WILLIAM MURRELL in his CLINICAL LECTURES ON THE PREVENTION OF CONSUMPTION, recently delivered at the Westminster Hospital and now reproduced in book form by Messrs. Baillière, Tindall and Cox.

Statistics show that one person in every eight in this country dies from phthisis. During the years 1848 to 1880, inclusive, the deaths recorded as due to this disease exceeded 51,000 per annum, and in 1892, when the death-rate from phthisis was the lowest on record, the number registered in England and Wales was 43,323. Cancerous disorders were responsible for 20,353 deaths during the same year, and the whole of the zymotic diseases for £2,099, whilst there were only about 16,000 fatal cases from accidents. It is clearly apparent therefore that consumption easily heads the list of mortality from any one cause. As Dr. MURRELL pertinently indicates, also, the

disqualifying power of the disease is enormous, patients who suffer from it surviving and requiring more or less attention during an average of something like five years, and it is assumed that there are at the present time from 150,000 to 200,000 people suffering from the disease in England and Wales. The causes of its great prevalence are numerous and not far to seek. In the first place phthisis is undoubtedly communicable. Husbands and wives communicate it to each other, and patients to nurses; whilst soldiers, sailors, and others in confined quarters readily acquire it when associated with affected persons. The air exhaled by patients and dried sputum disseminated in dust appear to be the main sources of contagion. Beds, sleeping apartments, railway carriages, and ship cabins, used by patients, probably act as secondary agents, whilst omnibuses plying on the routes leading to and from consumption hospitals have been described as veritable death traps. Investigation has also proved that phthisis can be inoculated and that it is communicable from the lower animals to man. In the case of the hecats of children who die of tubercular disease, much of the mortality appears to be due to the use of milk from tubercular cows, and imperfectly cooked tubercular meat is also doubtless responsible for the spread of the disease. In this connection it is interesting to note that KOCH's tuberculin has proved of value as a diagnostic agent. In New York and Denmark it is injected into suspected animals, which are forthwith killed if the temperature rises markedly afterwards, this being considered sufficient evidence of the existence of the disease.

The chief preventive measures recommended by Dr. MURRELL are the inclusion of consumption in the list of notifiable diseases, the disinfection of rooms, etc., used by consumptive patients, the removal of consumption hospitals to the outskirts of large towns, the rejection after inspection of tubercular meat and milk, the inspection of herds, and the prevention of overcrowding amongst animals intended for consumption as food. Overcrowding should also be prevented amongst the population, houses and other buildings need to be built so as to admit the maximum of light and air, and dusty occupations ought to be regulated. Much may also be done by personal effort. Thus, healthy persons should refuse to sleep in the same room with phthisical patients, the temperature of such rooms should not be too high, and they should be efficiently ventilated. Recipients of expectorated matter ought to contain a good disinfectant, and the contents be afterwards destroyed by fire. The thorough disinfection of patients' linen is also essential. Nurses should get out in the fresh air as much as possible, food be well cooked, and milk boiled previous to use, whilst people predisposed to phthisis should exercise care in the selection of a

residence or occupation, and in their general mode of life. There is little doubt that all the precautions suggested will be found more or less necessary before there is any decided check to the progress of phthisis, and Dr. MURRELL is to be congratulated on putting his case so clearly as to be quite comprehensible to even non-technical readers.

SCIENCE PROGRESS.

SPECIAL interest attaches to several of the articles in the April number of *Science Progress*. In the first, Professor C. S. ROY, of Cambridge, bases a series of observations on notes by Mr. W. M. CONWAY of his experiences in the Karakoram Himalayas, more particularly with regard to the symptoms termed mountain sickness (Fr. *mal des montagnes*; Ger. *Bergkrankheit*). These symptoms become more distressing in proportion as a height of 16,000 to 17,000 feet is exceeded, and may become so dangerous as to endanger life. They include difficulty of respiration accompanied by great distress, palpitation of the heart, severe headache, giddiness, nausea with or without vomiting, bleeding at the nose, lividity of the face, etc., etc. Professor GOEBEL, of Munich, dealing with the metamorphosis of plants, states that, though division of labour does not necessarily involve metamorphosis, it may certainly be regarded as a condition of its manifestation. Physiological requirement would appear, therefore, to be the main factor in effecting structural differentiation, whilst the particular organ to undergo modification will be that most susceptible to a change in the desirable direction. H. A. MIERS explains how the nature of the symmetrical repetition in space of its ultimate parts, which confers on matter the symmetry shown by crystals, has been ascertained; and A. W. BENNETT discusses the meaning of the term "tendency," as employed in biology, with the object of showing that, accepting WEISMANN's definition of "acquired characters," there is in those characters a hereditary factor which renders it impossible to draw any satisfactory distinction between them and "non-acquired" characters. The subjects of the remaining articles are on "Spanish Anthropology," by JOHN BEDDOX, "The Coagulation of the Blood," by Professor W. D. HALLIBURTON, and "Recent Contributions to the Geology of the Western Alps," by J. W. GREGORY.

DOCTORS v. CHEMISTS.

In these days of overcrowding and competition, remarks the *Sunday Times*, in an unusually sympathetic mood, the medical profession suffers more perhaps than any other calling in the country. "It has many attractions of the highest and noblest kind, which appeal to an ever-increasing number of people, besides which it offers not a

few rich prizes to the ambitious and the money-loving. But it is melancholy to reflect upon the condition of thousands of doctors throughout the country, thoroughly capable men who cannot get sufficient practice to enable them to live in a style expected of their profession." According to our contemporary, a member of the medical faculty attributes the present state of affairs to the growing practice among chemists of prescribing for customers, thus depriving the general practitioner of patients; though with a burst of humour it is remarked that it might be imagined that this practice would provide him with not a few. In the opinion of this practitioner a society should be formed to protect doctors from the prescribing chemist, but, as the *Sunday Times* points out, it must be remembered that such a society, without the aid of the public, could effect but little good, for its success would depend entirely upon the evidence of informers. It may also be suggested that the fact is lost sight of that, even if prescribing by chemists were totally extinct, there would yet be more doctors than are required. All the professions are overcrowded with men who may, in some respects, be considered "thoroughly capable" but yet somehow fail to hit the mark, and they would therefore seem to have missed their proper vocation.

PHARMACEUTICAL DEGREES.

THE *Pharmaceutische Rundschau* gives a historical sketch of the steps that have been taken in the United States in reference to the creation of degrees for pharmacists. The title of "Graduate in Pharmacy" is now commonly used there, but the prevailing tendency appears to be mainly in the direction of conferring the title of "Master in Pharmacy" or "Doctor of Pharmacy." The Philadelphia and New York Colleges of Pharmacy have actually decided to introduce the latter title, and the *Rundschau* regrets the innovation, deeming it a grave error. It rightly contends that the creation of a class of Doctors in Pharmacy, without legitimate academic recognition, must both fail to bring any advantage or prestige to the Colleges, and to raise the standing of pharmacy in public estimation, whilst it is bound to aggravate the already strained relations between medical men and pharmacists.

EVENING MEETING IN EDINBURGH.

AN Evening Meeting of the Pharmaceutical Society will be held in the Society's Hall, 36, York Place, Edinburgh, on Friday, April 26, at 8.30, Mr. J. LAIDLAW EWING in the chair. The following papers will be read:—

"Ferrous Phosphate," by GEORGE COULL, B.Sc.

"Smaller Sized Pharmacopoeial Pills," by WILLIAM LYON.

"Note on Commercial Linseeds," by A. J. DEY and W. B. COWIE.

Transactions of the Pharmaceutical Society of Great Britain.

EXAMINATIONS IN LONDON.

April, 1895.

MAJOR EXAMINATION—PASS LIST.

Candidates examined.....	32
" failed	20
" passed	12

Banks, Edward Herbert Hardy.
Brown, William James.
Bryant, Nicholas John Andrew.
Elliott, Oliver Thomas.
Gaul, Ernest George.
James, David Griffith.
Morrey, George.
Pearce, Seymour Rowland.
Prior, James Siddall.
Thorp, Ernest.
Tree, John.
White, Henry Fox.

MINOR EXAMINATION—PASS LIST.

(First Portion.)

Armbricht, Ernest Louis Nelson.
Attenborough, Harold Langley.
Baker, Daniel Sebbon.
Bastow, Sidney.
Bateson, Alfred Campbell.
Beaton, Edward.
Bond, John Henry Price.
Bowden, Harold.
Bridges, Herbert.
Brown, Harold.
Brown, Herbert Cecil.
Chambers, William Banks.
Clayton, George Francis.
Comp' on, Richard William.
Cooper, Burton Frederick John.
Cuff, Sidney Wilmot.
Dawson, Henry Gray Woodhouse.
Edwards, William Richard.
Evans, Evan Lewis.
Ferguson, Howard.
Flower, John Scott.
Forster, Horace Reginald William.
Giles, Lewis John.
Greaves, Ernest Walter.
Green, George Turton.
Gwinn, Frederick Walter.
Harries, John Davies.
Heden, Joseph Henry.
Hemming, William Hubert.
Hunt, Henry Lionel.
Jessop, Harry.
Jones, Joseph.
Kinsman, William Ernest.
Knowles, Charles John.
Laing, Joseph Lythall Leigh.
Lee, Arthur.
Lilly, Arthur.
Mace, Lewis Albert.
Marsh, Albert.

Maunder, William Henry.
Moore, Francis Ayrton.
Oliver, Gwilym Emrys.

EXAMINATIONS IN EDINBURGH.

MAJOR EXAMINATION—PASS LIST.

Candidates.....3 examined and passed.

Carter, William Henry.
Gates, Colvin.
Grier, James.

MINOR EXAMINATION—PASS LIST.

Candidates examined	121
" failed	69
" passed	52

Adams, William Stuart.
Akeroyd, Charles Edward.
Barton, Albert Henry.
Bell, John Rowell.
Bennie, John Wood.
Bowie, William.
Brown, Harold Edwin.
Campbell, Andrew Turnbull
Charnley, Arthur Walker.
Clark, Joseph Branch.
Cooke, Charles Woodfield.
Crawford, Andrew.
Crofts, John Lawrence.
Darney, William Ephraim.
Davidson, Samuel Riddel.
Dawson, Peter.
Dickson, Thomas George.
Downey, John George.
Fishbourne, James William.
Forbes, John.
Fortune, William.
Fraser, Henry.
Fuller, Herbert Emery.
Galloway, Alexander S.
Gambling, John Pattison.
Gammie, John Lawrence.
Harrison, Edward Evans.
Howorth, Frederick Arthur.
Hoyle, Arthur.
Hull, John Heber.
Kershaw, Frank Beckett.
Leach, Albert Henry.
Mennie, James.
Mercer, Frederick Peter.
Merry, Charles.
Orrell, William Pilling.
Palmer, Charles Nicholas.
Purdie, William Alexander.
Robertson, Daniel Coutts.
Robertson, James.
Rowell, Thomas Bell.
Russell, George Erskine.
Scott, Walter.
Simpson, Richard Todd.
Smith, Thomas William.
Smith, Walter.
Thompson, Wilson.
Uttley, John Richard Sellars.
Walker, James Donaldson.
Waterston, James Albert.
Wright, William Bruce.
Young, Alexander.

Provincial Transactions.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.

The present session of discussions and meetings promoted by this Society was brought to a close on Wednesday, April 10, when Mr. S. T. Rhoden read a paper on "Examinations and the Relative Positions of the Teaching and Examining Bodies." Mr. J. F. Eardley, the President, occupied the chair.

At the outset Mr. Rhoden maintained that the charge of apathy on the part of the outside members of the profession, so often deplored by the well-wishers of the Pharmaceutical Society of Great Britain, did not apply to Sheffield, where the members of the craft were ever ready to take an interest in or to express a decided opinion upon any questions affecting their position or welfare. Defining examinations as a process of a manifold character, he said the purpose of examinations, with which he intended to deal, was that which determined whether the examinee should receive the necessary legal qualification to prosecute the avocation of a pharmacist. After describing the varied objects of examinations, he went on to describe the position of the teaching bodies as one of the greatest responsibility and delicacy, inasmuch as they to a large extent controlled the destinies of those who committed themselves to their care. A careful training must be acknowledged to be of the highest importance, as education became thereby the keystone to examination.

The position of the examining bodies was justly accounted as being quite as delicate and less enviable than that of teaching bodies, because their contact with the life and susceptibilities of students is of short duration, and because moreover the capabilities and resources of the student have become by the time he presents himself for examination almost a known quantity. The duties of the examining body are to endeavour by a process of general questioning, not always without a little reasoning, to ascertain if the examinee has so trained his mental faculties, as to have earned that qualification or licence necessary to enable him to pursue the profession for which he has been training. Turning to the much discussed question of the teaching staff becoming examining bodies, he pointed out it was for those interested to consider how far teachers could undertake such work without being influenced by bias. Examining bodies must, like Cæsar's wife, be above suspicion. He held it must be admitted that teachers make the best examiners, because owing to their experience of the peculiarities of students they are most likely to foster that sympathy which should exist between them and the candidates. On the other hand, the fact should not be overlooked that in the event of the teachers sitting as examiners, in the course of time it would come about that their pupils would appear before them to obtain that qualification for which they had jointly laboured. He asked, Would not such an arrangement admit of collusion, or at any rate give rise to a suspicion of it?

In the discussion that followed Mr. Ward thought it unjust that a student who failed in one subject should be compelled when he next presented himself to again pass in the subjects in which he had been successful. He also suggested that the Minor and Major examinations should be merged, to be passed on two different occasions, the first part to be in writing and the second a practical one. He would also raise the standard of the Preliminary examination.

Mr. Morrison remarked that he had doubted the wisdom of the arrangement alluded to by the reader of the paper, and had there been a preponderance of successes on the part of students at Bloomsbury Square he would have objected to it, but such was not the case. In fact, the students at that institution had not been so successful as those taught elsewhere. He would prefer to be examined by a teacher than by a duffer. He did not agree with the suggestion as to the merging of the Minor and Major, but would like to see more subjects in the Preliminary, and have it more on the lines of the London Matriculation, though hardly so stiff.

Mr. Mallaband thought that to appoint professors at Bloomsbury Square as examiners would be unfair to students trained at other places.

Subsequently, Mr. Rhoden was thanked for his paper.

PLYMOUTH PHARMACEUTICAL ASSOCIATION.

The quarterly meeting, held at the Foresters' Hall, Plymouth, on Wednesday, the 10th inst., at 7.30 p.m., was a very representative one. Those present included C. J. Park (President), J. Maurice, R. F. Roper, A. D. Breeze, A. P. Kelly, J. G. Netting, Freeman W. Hunt, A. D. Davey, John D. Turney, R. Rendle, F. Maitland, W. H. Woods, J. Harvey Bailey (Treasurer), James Cocks (Hon. Sec.).

A meeting of the Trade Defence Section had previously been held at 7.15 p.m., to confirm the action of the committee re appointment of analyst and solicitor.

After the general business Mr. R. F. Roper introduced a discussion on "Matters of Trade Interest," dealing chiefly with prices and early closing, also alluding to Sir J. Lubbock's compulsory early closing Bill.

Mr. Kelly thought early closing ought to be made compulsory, and that chemists should be included in Sir J. Lubbock's Bill, also that local M.P.'s should be asked to support the same.

Mr. Rendle thought chemists should not supply articles after hours and on Sundays, as it frequently meant facilitating matters for stores who closed early.

Mr. Davey was afraid they were a bit at sea as to the true nature of the Bill, and that they should defer supporting it until better acquainted with its contents.

Mr. Park said the public seemed under the impression that chemists were always open for their convenience, and felt that by uniting the difficulty might be easily overcome; and as regards prices, since they had reached such a low ebb, he felt they were at the

bottom in that respect, as business would be practically unworkable if they went any lower.

Mr. Bailey asked if compulsory closing became general, how about emergency cases?

Mr. Hunt thought compulsion to close earlier would work all right, taking as a precedent banks. He also considered all B.P. medicines should be restricted to vending by chemists only.

Mr. Maitland thought some difficulty would arise in early closing in the three towns, owing to the geographical situation.

Mr. Turney felt the public ought to be more considered on Sundays.

Mr. Cocks proposed that the following resolution be sent to the Council of the Pharmaceutical Society:—

"This meeting approves of chemists being included in Sir John Lubbock's Compulsory Early Closing Bill, provided a clause be inserted for supplying medicines in cases of emergency."

This was seconded by Mr. Kelly, and carried.

Mr. Roper replied to the various remarks, and a vote of thanks was proposed by Mr. Rendle, seconded by Mr. Woods, and carried unanimously, as was also one to the Chairman, proposed by Mr. Kelly, and seconded by Mr. Maitland.

Scottish Transactions.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.

The annual general meeting of this Association was held on Thursday, 4th inst., at 9.15 p.m., and there was a good attendance, being the best during the session. Mr. W. L. Currie presided, and, after the adoption of the minutes, introduced the first part of the business, a report from the Committee appointed in council to draw up suggestions for a new Pharmacy Bill.

Report of Legislative Committee in Favour of a New Pharmacy Bill.—It is agreed: 1st. That the Pharmacy Acts require amending! 2nd. That all persons on the Register of Chemists and Druggists be members of the Pharmaceutical Society and eligible for election to Council in virtue of such registration! 3rd. That all open shops for the sale of poisons and dispensing of prescriptions be registered! 4th. That the registration of persons and shops be maintained by annual fees! 5th. That the term "person" shall include the individual members of a corporate body! 6th. That the Preliminary examination be passed before beginning the period of apprenticeship, and that a curriculum before the qualifying examination be enforced! 7th. That there be district representation on the Council! 8th. That the Pharmaceutical Society be empowered to exercise control over the conduct of its licensees, even to the removal of names from the Register!

The President having read the clauses, a discussion on the clause making it compulsory that the Preliminary examination, or an equivalent to it, be passed before apprenticeship begins, was entered upon. Fears were expressed that apprentices would be difficult to get under such conditions, but the report was ultimately

approved of unanimously. In connection with this the President expressed a strong desire that in cases of civil prosecution, the employer should be liable for all fines.

The secretary afterwards read the following report of the Committee—Messrs. Boyd, Dunlop, and Lacing—appointed to consider the—

REVISION OF THE BRITISH PHARMACOPOEIA OF 1885.

The Glasgow and West of Scotland Pharmaceutical Association desires first to thank the Medical Council and the Pharmacopoeia Committee for their courtesy in inviting pharmacists generally to co-operate with them in producing a new Pharmacopoeia which should be in advance of any similar production that has preceded it. We are fully aware that it will be a difficult and arduous work; and the difficulties should not be perceptible in the finished product, which ought to be on all points definite, decided, comprehensive, and brief.

Weights and Measures.—We are of opinion that (though the metric system of weights and measures must ere long be adopted to the exclusion of any other system) it would be injudicious to withdraw the present system at one fell sweep, as much from consideration of the derangement it might cause to prescriber and dispenser as to the pharmacist in manufacturing official preparations. Therefore we think equivalents in metric weights and volumes should be stated throughout the formulæ for this edition.

Withdrawals.—As old generations of physicians pass away, many of the remedial agents they employ pass with them, new and more advanced types of physicians and medicines taking their places. It is unwise and unfair to the rising generation to retain remedial agents now comparatively seldom used and likely to be less used in the future, since their places are more than filled by agents of more virtue and activity. And, as the value of any drug lies as much in the intelligence wherewith it is administered as in its own qualities, a few agents well known by the physician—tried and proved—are more serviceable than many, of which a theoretical knowledge only can be acquired. Therefore the weeding out should rather err in being overdone than underdone, and a better knowledge of what is retained must result to the advantage of the Pharmacopoeia, of the younger physicians, and students of medicine.

Proposed Omissions.

Acetum	Conf. scammonii
" ipecacuanhæ	" terebinthine
Acid. lacticum	Cataplasmata
" meconicum	Conii fructus, et tinct. c.
Aqua anisi	Cusparia cortex, et infus. c.
" carui	Decoctum saras
" fœniculi	" ostraris
" menthæ viridis	" granati radices
" pimentæ	Elemi, et ung. e.
Armoracis radix	Emp. ammoniaci c hydrarg.
Beberinæ sulph.	" plumbi iodidi
Bela fructus, et ext. liquid.	" saponis fuscum
Cambogia, et pil. cam. co.	Enema terebinthinæ
Canellæ cortex	" opii
Cassia pulpa	Extract anthemidis.
Confectio sennæ	" calumbæ
" piperis	" hematoxyli
" rosæ gallicæ	" kramerisæ

Ext. meserei etherium	Ol. sabinæ
„ papaveris	Pilula aloes Barb.
„ quassia	„ Socotrina
„ rhamni frangulae	„ cambogia composita
„ rhei	„ conii
„ stramonii	„ ferri carb.
Fel bovinum purif.	„ „ iodidi
Glycerinum acid. gallic.	„ „ saponis co.
„ „ tragacanth	Pilula scammonii co.
Hæmatoxylum.	„ „ scillæ co.
Hemidesmi radix	Potassa sulphurata
Infusum aurantii	Pulv. catechu co.
„ „ comp.	Prunum.
„ „ catechu	Rosæ gallicæ
„ „ cusparia	Syrupus aurantii flores.
„ „ ergotæ	„ „ hemidesmi
„ „ krameria	„ „ mori
„ „ matico	„ „ rosæ gallicæ
„ „ rhei	Suppositoria c saponis
„ „ valerianæ	Sumbul radix, et tinct. s.
Leo.	Tamarindus
Laricis cortex, et tinc. l.	Tinctura aloes
Liniment hydrargyri	„ „ aurantii recentis
„ „ sinapis co.	„ „ buchu
Liquor iodi	„ „ conii
„ „ hydrarg. perchlor.	„ „ cinnamomi
Lotio hydrarg. flav.	„ „ cocos
Manna	„ „ ergotæ
Marmor alb.	„ „ jalapæ
Mastiche	„ „ laricis
Matico folia	„ „ pyrethri
Mesereum cortex, et ext.	„ „ quassia
m. æth.	„ „ sabinæ
Mica panis	„ „ sumbul
Mistura ferri aromat.	„ „ veratri viridis
„ „ scammonii	„ „ stramonii
Morphinæ bimeconas, et liq. m.b.	Unguentum cantharidis
Mori succus, et syrup. m.	„ „ elemi
Moechus	Aloes from tinct. benzoin
Nectandrea cortex	co.
Ol. menthae viridis	Vinum aloes
Ol. rutæ	„ „ ferri
	„ „ rhei

Proposed Additions.

Acetanilidum. Dose up to 4 grains.	Pulvis guaiaci compositus.
Acid. hypophosphorosum. 30 per cent. HPH_2O_2 .	Guaiac. resin in powder..... 2 parts
Sp. g., 1.1367.	Powdered sugar 2 „
Acid. lacticum. Sp. g. 1.22. Dose up to 2 minims.	„ „ acacia 1 „
Bismuth salicylas, $\text{BiO} \cdot \text{C}_7\text{H}_5\text{O}_2 \cdot \text{H}_2\text{O}$.	Mix.
Cocaina, alkaloid.	For making mist. guaiaci.
Citrates effervescent., e.g., Caffeina citras effervescentes—	Sodium hypophosphis.
Citrated caffeine 4 parts	Syrup. apomorphinæ hydrochlor.
Bicarbonate of sodium 46 „	Syrup. codeinæ.
Tartaric acid ... 24 „	„ „ ferri phosph. c
Citric acid 16 „	„ „ quina et strychnina.
Sugar..... 10 „	Syrup. ferri et quinae hydrobrom. c strychnine.
100	Syrup. hypophosphitum compositus.
So with lithia, using carbonate, and potassium.	Syrupus pruni virg.
Pil. phosphori composita, containing iron, quinine, and nux vomica or strychnine.	Liquoropepticus, vel pepsina
Pulv. cretæ gummosus, for making misture cretæ—	„ „ pancreatous
Prepared chalk... 1 part	„ „ picis carbonis
Powder of acacia 1 „	„ „ hydrarg. perchlor.
Powdered sugar... 1 „	1 per cent.
Mix.	Emulsio ol. morrhuae hypophosphitis
	Elisir in place of
	syrup. rhei et syr. sennæ
	Elisir saccharini
	„ „ cascara sagrada
	Glycerinum iodi
	Mistura cretæ
	Take of gummy powder of chalk 55 grains, cinnamon water to make ʒj, and mix by trituration

Mistura guaiaci	Tinctura singiberis
Take of compound powder of guaiacum 55 grains cinnamon water to make ʒj, and mix by trituration	Take of stronger tincture of ginger, 2 parts rectified spirit 6 parts Ung. stavisagriæ Make from the oil

SUGGESTIONS AND MODIFICATIONS.

Nothing should enter the Pharmacopœia of which the composition and mode of producing cannot be given.

Processes need not be given for the manufacture of chemicals which can only be produced on the manufacturing scale.

All tests given should be followed by a statement of the object of the reaction, positive or negative, indicating what they are to prove or disprove.

List of preparations into which a drug enters should be deleted.

Acetum Scillæ.—Bulb to be cut small (not bruised) and acid. acet. dil., 1 in 6, should be used for this preparation.

Glycerin preparations (excepting glycerinum plumbi subacet. and glycerinum amyli) to be uniform—1 in 6 by volume.

Mucilage of acacia to be made with chloroform water.

Oils (Fixed).—Tests for purity to be given, and to detect impurities.

Ointments, where practicable, to be prepared by melting the base by a steam or water bath before adding the medicament.

Gall and opium ointment is improved by infusing the opium in the benzoated lard at a temperature just over its melting point, for an hour before adding the powdered galls.

Iodide of Potassium Ointment—

Take of—

Iodide of potassium.....	64 grains
Hyposulphite of sodium.....	1 grain
Glycerin	60 grains
Benzoated lard	1 ounce
Water	5 minims

Triturate the iodide with the glycerin, add the lard, and lastly the hyposulphite of sodium dissolved in the water.

Oleate of Mercury Ointment (20 per cent.)—

Take of—

Red oxide of mercury	1 ounce
Oleic acid	2½ ounces
White petroleum (paraffin molle alb.)	1½ ounce

Add the oxide to the acid at the temperature of a steam bath, and after combination add the white paraffin. To be diluted with oleic acid or paraffin as an oleate or an ointment is required.

Pill Excipients.—Aloes and myrrh: syrup 1 part, in place of treacle and glycerin, and pills 4 grains. Aloes and iron: confection of hips, colocynth. co. spt. ammon. aromat., 1 part to 20. Pil. plumbi c. opio: 1 in 8 of a mixture of ½ equal parts of P. acacia, glycerin, simple syrup. Pil. rhei co.: simple syrup 1½ for treacle and glycerin (4), and 4 grain pills.

Syrups to have the sugar in the proportion of not more than 32 to 17 of fluid. Cane sugar always to be

used. Syrups of iodide and phosphate of iron are improved by having 2 minims per ounce of hypophosphorous acid.

Syrup of Squills—

Take of—

Vinegar of squill (1 in 6)	12 ounces
Water	5 ounces
Sugar	32 ounces

Dissolve with a gentle heat.

Suggestions.

Tincture of opium to be prepared by the process of the old Edinburgh Pharmacopœia.

Tincture of calumba to be prepared with rectified spirit.

Acid Carbolic—Raise melting point to 38° C. or 40° C.; give quantitative test. *Vide* U.S.P.

Acid Salicylic—Melting point 156° C.

Argent Nitras—has been prescribed in doses of 5 grains.

Emplastrum Belladonnæ. To be made more consistent by lessening the amount of extract.

Morphinæ Tartaras for hypodermic solution.

Desideratum.—A condensed pocket edition of the Pharmacopœia with flexible binding, containing only formulæ and doses. Arranged under the head of the drug or chemical which gives the name to the article (as in Squire's "Companion"), for the use of the medical profession. *Vide Pharmaceutical Journals* for December 15, 1894, January 19, and March 2, 1895.

Committee... { THOMAS DUNLOP, Ph.C., M.P.S.
ALEXANDER BOYD, A.P.S.
ALEXANDER LAING, A.P.S.

In the discussion a disposition to question some of the findings manifested itself. Of the formidable list of things to be withdrawn, several appeared to have advocates in favour of retaining. The preparation of oleates by the process of double decomposition found favour; a desire to increase the number of effervescent preparations found expression, but the battle royal was waged for and against the metric system of weights and measures. As the system to be adopted forthwith, it was supported by three independent voters (the Committee did not vote); as an alternative with the present system it had seven supporters, while a large majority favoured the present system and no other. Nevertheless, the report was sanctioned with unanimous consent, and the Committee thanked for its services. The treasurer, Mr. J. Anderson Russell, then intimated that the income for the session amounted to £24 2s., expenditure £14 8s. 11d., balance £9 14s. 1d., total balance £35 9s. 7d.

The secretary then read the following:—

ANNUAL REPORT.

Reflecting upon the events of the past year, the third of our existence as an Association, your Council considers that the session now being closed has surpassed previous sessions in hard, practical work, and has been remarkable in several ways. The great event of the session undoubtedly was the visit of the President of the

Pharmaceutical Society, Mr. M. Carteighe, in November last, which called forth the best meeting of pharmacists Glasgow has seen for many years. Nor was the address delivered on that occasion by Mr. Carteighe transient in its effect. Vigorous plain-speaking without ambiguity is relished by "lang-heilded" Scots as most complimentary to them; and that distinguished the address throughout. It did more to let us know where we are and how we stand than any previous rhetorical effort has done; one of its effects being to produce the Committee on Legislation amongst your Council, whose report has just been handed in. The next important event of the session was the severe weather which prevailed throughout the earlier part of the year, and had a modifying influence on the attendances at our meetings, as the members who were not rendered *hors de combat* themselves had so much to do in ministering to the sick and afflicted that the business of the Association had to be carried on in the absence often of its most regular attenders. The opening address given by Dr. D. C. McVail presented a high ideal of the respective duties of physician and pharmacist, and was worthy of such a man. The absence of our President since the opening meeting was matter of general regret, but the pleasure of seeing him again amongst us, though towards the close of the session, is correspondingly great.

The bulk of the work done has been closely connected with matters pharmaceutical, and but for small attendances a considerable advance is observable in the subjects brought before the Association. Messrs. Laing, Boyd, Dunlop, and Brodie gave papers all bearing more or less on the Revision of the Pharmacopœia; Mr. Lunan, of Edinburgh, contributed valuable notes on the same important subject. All of these papers have again come under consideration by the Committee appointed to arrange the suggestions in their natural order, whose report is also now to hand. The Association is likewise indebted to Mr. Wm. Watson for notes on Parrish's syrup, some commercial samples of which he found to have too little lime for building purposes, and some in which the presence of iron could only be inferred. Mr. Blair, on Hospital Dressings, introduced an interesting subject which proved a good case, and was treated exceedingly well. Dr. Carswell and Dr. Bryce gave lectures of deep interest to all who heard them, and last, but not least, Mr. Rutherford Hill added one more to the good accounts he has given us of things that everybody does not know.

The motion brought forward in June last by Mr. Russell, the discussion of which was adjourned, it has not been possible to adequately consider during the session, as the syllabus shows, but since it was duly seconded and appeared to your Council to embody important legislative suggestions, it has been taken in hand by the Committee appointed to draw up suggestions towards a new Pharmacy Bill, and adopted in the form submitted to the Association. Your Council thinks it unfortunate that business has to be carried on to such late hours that the meetings are not started early enough to allow the papers read to receive the

full amount of criticism which they deserve, and such as would give more life and liveliness to the meetings. It is also regretted that the younger members do not take a more prominent part in discussion; and an endeavour will be made in future sessions to obtain from them more active co-operation in arranging the syllabus.

In looking over the actual work done during the session, your Council is strongly of opinion that, if early closing could enable the Association to begin its meetings at an early hour, it possesses all the qualities essential to making it one of the best organisations in the country in connection with pharmacy. In conclusion, your Council has much pleasure in expressing its satisfaction with the presiding genius of Mr. John Foster during the temporary disablement of the President. Mr. Foster's urbanity and tact have been pleasantly experienced by the members and appreciated accordingly. The membership on the roll was 144.

The reports having been approved of,

Mr. W. L. Currie in retiring from office spoke strongly in favour of early closing, urging chemists to give their support and come under the jurisdiction of the Bill now in Parliament. He thought the late hours were shameful, and the public had been too well served by chemists for no good reason. He thanked members for their courtesy and kindness during the three years he had been in office, and hoped the Association would continue to flourish like a green bay tree. Mr. John McMillan moved, and Mr. T. Robinson seconded, that Mr. Currie be again elected President. It was warmly endorsed by all the members, and Mr. Currie was prevailed upon to continue President of the Association. Most of the former office bearers were re-elected, the changes being Mr. J. Anderson Russell, elected to fill the offices of secretary and treasurer, Mr. Innes, elected district secretary for the north-west, and Mr. Alexander Miller for the north-east, Mr. Maltman to the Council, and Mr. A. Laing, late secretary, vice-president. The third bye-law was deleted, and the limit to three vice-presidents removed from the rules. The membership subscription to be paid by country members was left over for the Council to decide, and the business concluded.

Reviews and Notices of Books.

THE EXTRA PHARMACOPOEIA. By WILLIAM MARTINDALE and W. WYNN WESTCOTT, M.B. Lond. Eighth Edition. Pp. 581. Price 9s. (H. K. Lewis, 136, Gower Street, London.)

The new edition of this useful work gives ample indication of the care bestowed by the authors upon the work of incorporating information acquired since the last issue, three years ago. The extent to which new material has been added will be evident from the fact that the present edition contains fifty-seven pages more than the last. The continued introduction into medical use of various synthetic products has afforded occasion for part of the increase in the extent of the work, while the descriptions of the articles comprised in the recent addenda to the 'Pharmacopée Française' and the 'Pharmacopœa Germanica,' as well as those included

in the unofficial formulæ of the British Pharmaceutical Conference, occupy a considerable part of the additional space. A special chapter is devoted to the curative agents now obtained from animal sources in the form of antitoxins, serums, lymphæ, and the preparations derived from animal glands and tissues. Throughout the body of the work many points worthy of note have been collated also from the recently published pharmacopœias of the United States, Italy, Switzerland, Denmark, and Japan.

In view of the forthcoming revision of the British Pharmacopœia, the authors state that they have been for some time past engaged in investigating the claims of drugs and preparations to official recognition. With that object they give the results of an analysis of a very large number of recent prescriptions, which have been collected not only in various parts of the United Kingdom, but also from Australia, New Zealand, Canada, and India; and tables have been prepared showing the unofficial articles which are most frequently in demand, and the official articles which are now seldom prescribed. It is interesting to learn that from these statistics it may be deduced that the *materia medica* of the Colonies is much the same as that of the mother country, so that it may be assumed the requirements of an Imperial Pharmacopœia will not differ very widely from those now existing in this country.

A prominent feature of the 'Extra Pharmacopœia' is the therapeutic information which some recent critics of the British Pharmacopœia think would be a suitable addition to that work. No doubt it serves a useful purpose in the 'Extra Pharmacopœia,' and largely contributes towards making that book more popular to medical men than the British Pharmacopœia is said to be, or perhaps need be, since its special purpose as an assistance to prescribers would be sufficiently served if it secured uniformity in the medicinal preparations which they are in the habit of ordering in their prescriptions. So far as official preparations are concerned, it may be taken as certain that such a condition is now much more to be relied upon than it was formerly, when pharmacists were very often in the habit of making medicinal preparations according to private formulæ, and paid little attention to the Pharmacopœia. But in connection with this point it is curious to observe how proprietary and patented preparations with fancy names are taking their place in the 'Extra Pharmacopœia' in much greater numbers. Whether that be merely the result of a desire to furnish information as to the nature of these articles, or whether it is to be understood as an indication that such articles are being prescribed by medical men on the strength of recommendatory advertisements, we do not pretend to determine, but it is clear that there is here a considerable danger that the uniformity in medical treatment which would result from pharmaceutical adherence to the directions of the Pharmacopœia may be counteracted or largely interfered with. That has been the case to a very mischievous extent in the United States, and if the interest now taken in this country in regard to the therapeutic

aspect of pharmacopoeial revision can be directed towards securing greater loyalty to the British Pharmacopoeia amongst prescribers as well as pharmacists, much good may be effected.

The introductory part of the 'Extra Pharmacopoeia' contains some suggestive remarks as to the changes to be introduced in the revision of the British Pharmacopoeia, and prominence is given to the desirability of adopting the metric system of weights and measures, in conformity with the practice of almost all other civilised countries.

ANATOMISCHER ATLAS DER PHARMAKOGNOSIE UND NÄHRUNGSMITTELKUNDE. By Dr. A. TSCHIRCH and Dr. O. OESTERLE. Parts 5 and 6. Price 1s. 6d. each, nett. (Williams and Norgate, London.)

The fifth part of this anatomical atlas includes the examination of pomegranate bark, verbasum flowers, saffron, turmeric, and pepper; the sixth treats of ginger, red sandal wood, brazil wood, figs, orris, and marsh-mallow root.

Each drug is dealt with in the exhaustive manner which has characterised all the preceding parts of the work. Under pomegranate bark is included the bark of the stem as well as that of the root, the commercial drug consisting principally of the former; from the reactions obtained by various reagents, the parenchyma of the primary bark and phloem is considered to be the seat of the alkaloid pelletierine. The anatomy of saffron is followed by and compared with that of calendula florets and safflower, and in addition, a useful table has been appended showing the action of various reagents on powdered saffron, which should prove of material service in the examination of the powdered drug. Verbasum flowers will probably be of less direct interest to the English pharmaceutical student, but the study of these flowers and of the hairs which clothe the filaments as well as those on the calyx and corolla is extremely instructive; the former contain a substance frequently crystallising in sphaero-crystals, and probably, judging from its reactions, a sugar. In view of the use of turmeric as a colouring agent, its identification in the form of powder is important; this can, according to the author, be effected without difficulty.

Black pepper appears to have received special attention. The morphology of the flower, the structure of the floral axis, and the development and anatomy of the fruit, both mature and immature, are fully described. The tissues which are specially valuable as diagnostic characters are pointed out, and the distribution of the piperine, together with the reagents that are most useful in detecting it, receive a fair share of attention. The plate which illustrates the anatomy of this drug is, without doubt, the most complete and most beautiful that has ever been published, a result due mainly to the improvement in the ink used, to the unsatisfactory nature of which allusion was made some time ago in the columns of this Journal. In this respect the succeeding plates compare unfavourably with those of Part 5. Of special interest in Part 6, apart from the anatomy of the drugs, is the demonstration that

the red gum resin or resin of red sandal wood is formed in the "resinogenous" layer of the cell-wall it is therefore a true secretion, and not a product of metamorphosis of the membrane. The crystals of calcium oxalate in orris root are shown to have a similar origin, and this fact is regarded as supporting the assertion that secretions are usually formed in the membrane, and not in the protoplasm. On the other hand, the mucilage in marsh-mallow root, which, like the secretions alluded to, is no product of retrograde metamorphosis, is deposited directly on the cell-wall in the form of secondary thickening; it appears to act, principally, at least, as a water-reservoir, since it is comparatively seldom redissolved, and to belong to the class of true mucilages, as distinguished from cellulose-mucilages which yield the cellulose reaction with chlorzinciodine and similar reagents. These remarks suffice to show how replete with interest this work is for all who make botanical anatomy the object of their study. It is, however, to be regretted that the scale of magnification is still omitted.

REARING AND FEEDING OF CHILDREN. By Thomas Dutton, M.D. Pp. 198. 2s. (Henry Kimpton and Hirschfeld Brothers, London.)

We have on several previous occasions taken the opportunity of favourably reviewing Dr. Dutton's semi-professional writings on account of their excellence, plain sense, and lucidity. The present book is no exception to its predecessors, and shows clearly enough that the author understands thoroughly the subject on which he writes, and has the ability of making his opinions clear to others. Every chapter in the book is interesting, and no particular mode of feeding children is puffed up at the expense of others, thus showing that the author takes a broad view of the subject, and is in no sense a faddist. Mothers and nurses will derive the greatest possible advantage from a perusal of this book, and will also learn this great lesson—Many diseases from which young children suffer are wholly due to improper food; and the remedy for troubles thus produced is to improve the diet, and not to annoy the child by cramming it with drugs.

KING'S COLLEGE HOSPITAL REPORTS. Edited by NESTOR TIRARD, W. WATSON CHRYNE, JOHN PHILLIPS, and W. D. HALLIBURTON. Pp. 402. Price 7s. 6d. (Adlard and Son, London, 1895.)

This is another addition to the list of Annual Reports issued by several large metropolitan hospitals; we trust that the subsequent volumes of 'King's College Hospital Reports' will equal the present one in interest and value. The book opens with a historical sketch of King's College and King's College Hospital, furnished by the Dean of the Faculty of Medicine, Dr. John Curnow. This is followed by a number of papers written by the physicians, surgeons, and those in charge of special departments. These special articles occupy 140 pages of the book. The remaining 250 pages are occupied by the usual statistical accounts of the cases treated in the in-patient and the various out-patient departments, and are, therefore, more complete than hospital reports in

general. There is interesting information under the heading "What Old King's Men are Doing," which cannot fail to interest those who were educated in this hospital. The "doings" of King's College are reported in such detail that the names of those who attended the annual dinner are duly recorded, and the volume concludes with a report of the after-dinner speech of the Chairman.

VULCANITE WORK. By HARRY ROSE. Pp. 68, with numerous original illustrations. Price 2s. 6d. (J. P. Segg and Co., Regent Street, London.)

This little book is written to explain the best methods of working vulcanite so as to obtain in the highest degree strength combined with thinness and lightness. The author devotes considerable space to explaining how to use and the advantages of the steam swager, which cannot fail to be of use to those who prefer this method of working, but he seems to claim too much for it. On page 10 he writes: "By using the swager for this purpose (contour work) the trouble and time lost in obtaining a zinc die and counter is saved, and the result obtained is so superior to that done by stamping up in metal dies that the two operations will not admit of any comparison." Now a comparison of the two methods is sufficient to show that, other things being equal, no time is saved, although the ultimate finish produced by the swager is certainly superior. About three pages of the book are taken up by a confusing description of how to make a cooked vulcanite plate as a matrix to mount the teeth on. The advantages claimed are such as can be far more easily and quickly obtained by the other methods in vogue which the author briefly describes. The book deals with many of the difficulties which the inexperienced are likely to encounter, but it contains nothing new for those who have received a proper training in dental mechanics.

Correspondence.

DEATH AND THE ATOMIC THEORY.

Sir,—I was vastly pleased to see you in last week's *Journal* sitting so complacently on Dr. MacWheeler and his microbe-death. In my opinion you gave the right-wheel to both. If you would do the same with the atomic theory when it is used as fact I would feel so much obliged—ever so much. The atomic theory is beautiful, for working with it leaves nothing to be desired; but, as a fact, I cannot see an atom of sense in it. The very meaning of the word—solution—massacres it; leaves it not a leg to stand on. It dissolves, and you might dissipate it with a retort. Let it be dissipated.

Glasgow.

ALEX. LAING.

THE COUNTY COUNCIL AND THEIR DISPENSERS.

Sir,—The circumstances under which the maximum salary of the Council's dispensers was reduced are these. About the year 1892 the Asylums' Committee decided to revise the salaries, emoluments, leave of absence, etc., of their officials, the result being that in nearly every case the salary was reduced and the emoluments abolished. This did not, however, apply to those who were at the time receiving the higher remuneration, but preventing any

further advance. Those who entered the service after that date, or being in and not having reached the maximum, were bound by the new rules. Thus now all the dispensers commence at £100, increasing to £120, notwithstanding the fact that the duties have been increased by enlarging the establishments, opening of photographic studios, etc. This remuneration, as you justly remark, "cannot be regarded as a proper amount for educated and skilled dispensers." Nor, to quote the phrase so largely used by the Council themselves, can it be deemed to be "the rate of wages considered fair in the trade." I am informed on good authority that an application for increase was made some little time ago and was met with a prompt refusal, and the assurance that if the dispensers' positions were vacant they could obtain others to do the duties for less money. VERITAS.

THE DETERMINATION OF ACONITINE.

Sir,—Is it not somewhat premature to attempt the exact determination of aconitine in the mixed alkaloidal product obtained from the usual galenical preparations of the drug? Mr. Umney, it is true, limits himself to *Aconitum napellus*, but even in that case it would be unsafe to assume that the acetic acid obtained by hydrolysis represented accurately the amount of crystallizable nap-aconitine contained in the sample. Wright asserted that *A. napellus* roots contained a small percentage of Fer-aconitine in addition to aconine and certain amorphous substances, which were probably products of chemical treatment.

Moreover, I observed in 1878 ('Year-Book,' p. 506), that all the alkaloidal bodies, whether crystalline or not, which I had isolated from *A. napellus* and *A. ferox* gave off when heated destructively "acid vapours of the same odour as pyroligneous acid." It is probable, therefore, that Fer-aconitine contains in its molecule the acetyl component; to say nothing of the amorphous bodies which form so large a proportion of the total alkaloids. I used not to expect to get more than one-third of the crystalline variety.

It would obviously be most unsafe to run the risk of confounding substances differing so markedly both in degree and kind of activity. Let us then wait for fuller information, and meanwhile be content with noting crystalline form, the action of well-known reagents, and when possible the results of physiological tests.

As regards the method of determination proposed, I fail to see that the aconine produced by the hydrolysis is allowed for in the calculation. Being salifiable it would of course influence to some extent the titration. I regret that I have not at present access to my books and papers and have therefore to rely mainly on memory.

THOMAS R. GROVES.

Answers to Correspondents.

[Answers to queries, which are likely to prove of general interest, will be found under the heading NOTES AND QUERIES.]

S. Feaver.—Your letter will be forwarded to the persons responsible in the matter, but there does not appear to be anything amiss more serious than two slight printer's errors—the introduction of an unnecessary comma, and the substitution of "i" for "u."

W. A. Mannings.—We cannot undertake to express any opinion upon the preparation.

COMMUNICATIONS received from Messrs. Braithwaite, Brown, Cocks, Gerrard, Jones, Hawthorne, Holloway, Lyon, Martindale, Robins, Schweitzer, Umney.

EPITOME

OF

CURRENT EVENTS AND USEFUL INFORMATION.

Notes.

THE REVOLUTIONARY VALUE OF NEW ELEMENTS.—The *National Observer*, commenting on what it describes as a threatened glut of new elements, remarks that there can be no doubt of the revolutionary value of the new elements, argon and helium. New elements are by no means rare finds, but such elements as masurium or yttrium fall into line with other rare finds and alter the general fabric of theoretical chemistry not a jot. Argon and helium, however, are of a different texture altogether, and probably herald a great period of scientific reconstruction, whilst they make many of the dreams of the theoretical chemist, that had grown familiar and faint, bright and hopeful once more. "One asks: 'Is this at last the way?'" The transmutation of the metallic elements—the Discovery of the Philosopher's Stone they called it—was the mother idea of chemistry. Modern chemist is only old alchemist grown wiser by millions of experiments. No chemist to-day will admit that the transmutation of these basal substances is impossible."

NOVEL ADJUNCT TO THE BALANCE.—For enabling workers with the balance to read the position of the pointer more exactly and readily, resort is often had to the device of fixing a magnifying lens before the divided scale. Another simple contrivance is suggested by W. H. F. Kuhlmann (*Zeits. für Instrument.*), in which the scale is reversed so as to face a concave cylindrical mirror attached to the column supporting the balance. The pointer is made finer at the end than usual, and moves between the scale and the mirror in which a magnified image of the pointer and scale appears.

STARVATION AND THE ACTION OF DRUGS.—The results of previous observers who have noticed that starvation affects the action of drugs has been confirmed in certain cases by Thomas Jordan (*Cent. f. d. Med. Wiss.*). Dogs were experimented on that had been fasting from three to twelve days, and control experiments were performed upon dogs of a similar kind. It was found that both the minimal dose producing any effect and the minimum fatal dose were less in the starved dogs than in the others, whilst the same dose killed the former sooner than those that were not fasting.

THE S. M. BURROUGHS' MEMORIAL.—We are asked to announce that the Council of the Chemists' Assistants' Association has opened a subscription list in connection with the above memorial, and that any contributions from one shilling upwards will be thankfully received by the Secretary, Mr. H. H. Robins, at 103, Great Russell Street, W.C.

POISONING BY ANTITOXIN.—The New York papers report the death of a girl of seventeen, after the injection of two and a half fluid drachms of Behring's antitoxin lymph. It is related that the girl was suffering from a slight attack of diphtheria, and died eight minutes after the injection of the fluid, having previously been violently convulsed.

HEMP DRUGS COMMISSION.—This Commission has declined to recommend the prohibition of the consumption of hemp drugs, but suggests a policy of restriction and control. The Governor-General also, having considered the matter in council, is of opinion that the Government should control the consumption and harmful use of hemp drugs, by making them as expensive as possible without driving people to resort to more noxious intoxicants than hemp.

EXHIBITION OF ECONOMIC PLANTS.—We are asked to announce that an exhibition of medicinal and other useful plants will be held at the Botanical and Zoological Garden, the Hague, Holland, from July 8 to 16 next. The five classes will include (1) living medicinal plants; (2), other useful plants; (3), drugs etc.; (4), vegetable products generally; and (5), books and instruments employed in the study of economic plants. Diplomas and medals will be awarded in each class, and particulars as to admission, etc., may be obtained of Dr. M. Greshoff, Laan van Meerdervoort, No. 97, à La Haye, Holland. The exhibition will be held simultaneously with the general reunion of the *Société Néerlandaise de Pharmacie*, which also takes place at the Hague.

DEATH OF DANA THE GEOLOGIST.—It is reported from Newhaven, Connecticut, that Professor James Dwight Dana, the eminent mineralogist and geologist, has died of heart failure. He had been Professor of Natural History and Geology at Yale College since 1855, and was a fellow of the Royal Society, London, as well as member of the French Academy, and other scientific bodies in Europe.

BOGUS GLUTEN FLOURS.—According to *Modern Medicine* a great number of bogus gluten flours are now being extensively sold in the United States. One sample examined was three-fourths starch yielding 0.715 Gm. for each gramme of flour. Occasionally ordinary "seconds" flour is sold as gluten flour, at a correspondingly advanced price, and ordinary bread can be made from most of the brands on the market.

ROYAL SOCIETY'S TRANSACTIONS.—In reference to a contemplated alteration in the form of the Royal Society's 'Transactions,' Mr. C. Tomlinson, in a letter to the *Times*, suggests the advisability of dropping the term "philosophical," by which the publication has hitherto been distinguished, and he supports the suggestion by quoting the sarcastic remark of Hegel that "England is a country where the thermometer and barometer are called philosophical instruments."

DEATH OF LOTHAR VON MEYER.—The distinguished author of 'The Modern Theories of Chemistry' has died at the age of sixty-five. He was Professor of Chemistry at the University of Tübingen, and had devoted his attention chiefly to the study of physiological and theoretical chemistry.

THE SUPPLY OF ANTI-TOXIC SERUM.—At the annual meeting of the Berliner Chemischen Fabrik auf Actien, it was stated that the number of horses now kept for preparing anti-toxic serum was 170, capable of supplying about 200 litres of the product per month.

THE EMPRESS FREDERICK AT SAN REMO.—Mr. Frank R. Squire, of San Remo, has recently received a very handsome scarf-pin of "diamonds and sapphires" from Her Majesty the Empress Frederick, which Her Majesty describes "as a small token of her gratitude for all the help and kindness shown during the stay of Their Majesties at San Remo." Mr. Squire had already received the appointment of "German Court Chemist," and is also gazetted chemist to His Royal Highness the Prince of Wales.

NATURFORSCHER VERSAMMLUNG.—Apotheker S. Muhsam (Moialingerallee, 2 c) and Apotheker C. Pfaff (Sandstrasse, 16) announce that by arrangement with the managers of the 67th meeting of Naturalists and Physicians, to be held in Lubeck from September 16 to 21 next, they have undertaken to prepare for the sittings of the Section of Pharmacy and Pharmacognosy No. 33, to participate in which they invite all representatives of the craft. They also request that notice of papers or communications of any kind to be brought forward at the meeting may be sent in at an early date before the end of May, so that they may be mentioned in the invitations which will be sent out at the beginning of June.

ANNUAL DINNER OF THE PHARMACEUTICAL SOCIETY.—We are desired to state that the full list of stewards in connection with the Annual Dinner on May 21 next, will be published in next week's Journal. Gentlemen who desire to act as stewards should therefore intimate the fact to the Secretary, Mr. Richard Bremridge, 17, Bloomsbury Square, W.C., forthwith.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

MORE INTERESTING MEDICAL DISCOVERIES.—Several interesting medical discoveries have recently been made in Vienna, and announced at meetings of the Society of Physicians. Professor Wagner von

Jauregg, who is in charge of the department in the University devoted to mental diseases, was induced by the improvement that always follows upon an infectious disease in cases of insanity, especially if it be accompanied with high fever, to bring about that condition artificially by means of inoculations with Koch's tuberculin. He now claims that, though after each injection the decidedly favourable symptoms soon disappeared, there was such a steady clearing of the confused sensorium as to encourage him to continue the experiments. It was mentioned by Professor Albert, in the course of a discussion that ensued, that transfusion of blood and subsequent high fever had caused astonishing changes in the mental condition of one of his patients, whose pronounced melancholia disappeared, as though by magic, after the fever had subsided. He, too, anticipated good results from the artificial production of high fever in persons mentally deranged. Dr. Riehl, a lecturer at the Vienna University, has also made a curious discovery. A man was recently brought into his ward suffering from blisters and swellings on the hands, as well as on one eye, which he had touched with a swollen hand. The man was a gardener, and he attributed the blisters to a plant called *Primula obconica*, one of the primrose family. Experiments were made, and it was found that the tiny hairs on the leaf and stalks irritated the skin, and gave rise to swellings and inflammation. Dr. Riehl succeeded in extracting the poison, which the plant apparently contains for its own protection, and by means of injections with it claims to have healed more than one obstinate skin disease. His experiments are not yet completed, but they promise good results. Finally, Professor Neumann has described the case of a child four months old, who had reddish serpentine stripes under the skin of the arm. These, he found, were caused by the eggs of a small caterpillar having got into the pores of the skin. The tiny worm from one of them had crawled about, and so caused the red marks, which disappeared after it had been confined to one spot and extracted.—*Evening Standard*.

LONDON HOSPITAL MEDICAL COLLEGE.—A stained glass window containing the coat of arms or crests of past or consulting members of the staff of the London Hospital, has just been erected in the Library of the London Hospital Medical College. It has long been desired to perpetuate in some manner the names of those who worked and taught for many years both in the Hospital and College, and it was recently decided to adopt this form of doing so. The window just erected contains thirty-two shields on which are displayed the armorial bearings of past or consulting members of the Staff, including those of Dr. John Andree, the first Physician, and Mr. John Harrison, the first Surgeon appointed in 1740. There are also the coats of arms of Sir William Blizard, Sir Andrew Clark, and Messrs. Richard Clement Headington, John Goldyer Andrews, James Luke, Thomas Blizard Curling, and Jonathan Hutchinson, all at one time or another Presidents of the Royal Colleges of Physicians or Surgeons, as well as other distinguished members of the medical profession who were on the staff of the London Hospital. It is hoped in time to add the armorial bearings of many others whose descendants at the moment have not been traced, and any information with reference to former members of the staff whose names do not appear in the present window will be gladly received by the Warden of the College, who will be pleased to show the window to all who may be interested.

SALE OF DEFICIENT LIQUOR IODI.—At the North London Police Court, on April 11, William Felton, chemist, of 253, Balls Pond Road, Islington, was

charged before Mr. Marsham, at the instance of the vestry of Irlington, with having sold liquor iodi which showed on analysis a deficiency of 15·2 per cent. of iodine, and 37·6 per cent. of potassium iodide, and was therefore not of the nature, substance and quality demanded.—Mr. Hoare prosecuted, and explained that this was a test case. The medical officer of health for the parish wrote out the prescription for six ounces of the preparation, and analysis disclosed the deficiencies stated.—Mr. C. V. Young said, in defence, that the defendant would plead guilty, but the weakness of the drug was accidental. It was a most volatile drug, and as it had been made some time and was seldom asked for its strength had evaporated. Its place had been taken by a tincture and a liniment, and although it at present appeared as a drug in the *British Pharmacopoeia* it would in the next edition probably be omitted.—Mr. Felton explained that to prepare the liquor iodi properly it would take from two to three hours. The messenger said that he was in a hurry, and to oblige him he handed him 4½ oz. of the drug which he had by him, and filled the bottle up with another preparation. The decreased strength would have no material effect on the drug, which was meant for outward application only, while the profit which might have been made had he any dishonest intention was one-eighth of a penny.—Mr. Marsham imposed a fine of 20s., with 12s. 6d. costs.

POISONED IN THE PULPIT.—A peculiar case of poisoning is reported from Mobile, Alabama, U.S.A. The Rev. Mr. Jessop, a Baptist minister, while in the middle of his sermon fell to the floor in spasms and died in a few minutes. The unfortunate clergyman had placed in one of his pockets some pieces of bread poisoned with strychnine, for the purpose of destroying the English sparrows which infested his garden in great numbers, and in another pocket he had placed a few lumps of sugar, with which he was in the habit of clearing his throat during his sermon. He appears to have placed his hand in the wrong pocket, and swallowed the poison before he discovered his mistake.

THE OPIUM COMMISSION.—The *British Medical Journal* says:—"The text of the Report of the Opium Commission is now complete, and it will be laid upon the table of both Houses as soon as possible. The Commissioners state that the abuse of opium as a drug and for smoking purposes is much less in extent than has been stated by some, and that the people of India do not make such an intemperate use of the narcotic as the Europeans, even in India, may be fairly charged with in the matter of alcoholic stimulants. In reference to the exportation of opium to China and the effect of the trade with that country upon the Chinese, the opinion is expressed that the growth and cultivation of the poppy in India have no appreciable effect upon the consumption of opium in China. It appears that India only sends to China about one-fifth of what that country uses, and that the rest is not entirely home-grown, but is imported from other countries, notably from Persia. In view of all the facts of the case, the Commissioners are not in favour of prohibiting either the growth of the poppy or the manufacture or sale of opium in British India. While, however, they are opposed to prohibition, they make certain suggestions in regard to the regulation and restriction of the traffic, and recommend that the decision of the Indian Government to put a stop to the smoking of opium on licensed premises be put in force. As regards the practice of eating or drinking opium, however, the non-medicinal use of the drug for pleasurable purposes appears to merge so into its medicinal use for the mitigation of suffering and the prevention of disease that it would be extremely difficult

—indeed, impossible—to interfere with the one purpose without inflicting great hardships on those who use it only for the other, and who find in it their one resource in the various ailments which are so common in damp and malarious districts. The investigations of the Commissioners make it clear that the habit of opium-smoking in India is quite a subordinate affair compared with that of opium-eating, and that it cannot be looked upon as a mode of the morphine habit, for the material absorbed consists not of morphine but of the products of its destructive distillation. It is, in fact, a habit or a vice of comparatively few, and is mostly confined to the towns, and a good deal of evidence went to show that its apparent evil effects were not due so much to the habit itself as the surroundings amid which it was practised and to the character of the people who indulged in it. It was clear that the *habitués* of the opium dens included a number of idle, dissipated, and vicious persons, and that the habit of opium-smoking was often resorted to by sufferers from pulmonary diseases for the relief of suffering, and it became obvious to the Commissioners, and those who followed the evidence, that the diseases prevalent among opium smokers were by no means always due to the habit. The report is again enforcing any radical change in a custom which, in regard to opium eating and drinking, is the growth of centuries, and a perusal of the addendum written by one of the native commissioners makes it clear that an alcohol-drinking people can but with evil grace protest against a habit for which there is so much more excuse, and which produces so much less evil results than would follow what many consider the alternative—namely, the spread of alcohol or ganja."

A CRAVING FOR CHLORODYNE.—At the recent Plymouth Quarter Sessions, Albert Tullidge, 49, draper, and Patience Tullidge, 58, brother and sister, on bail, were charged with obtaining by false pretences from Mr. James Maurice, chemist, one bottle of chlorodyne, of the value of 2s. 9d., with intent to defraud, on February 8.—Accused pleaded guilty.—Mr. Molesworth St. Aubyn, who appeared for the defence, said it was almost the saddest case within his experience. Up to the present time the prisoners had been people of irreproachable character, but the habit of drinking chlorodyne had induced them to commit the offence with which they were charged.—Mr. Symons, who appeared to prosecute, said he did not wish to press the charge.—Replying to the Recorder, the Chief Constable said the prisoners were old residents in Plymouth. They once kept a shop, and belonged to a highly respectable family.—Dr. Wolferstan, replying to the Recorder, said it was very seldom that persons gave up taking morphine, and when once they had contracted the habit, prevention was the only cure.—The Recorder remarked that if anything would induce the prisoners to break off the habit of taking chlorodyne it was their present position.—The Chief Constable having intimated that the prisoners would be cared for by their relatives, they were liberated on their own recognisances.

DANGERS OF SUBLIMATE IN TABLETS.—On April 14, as the Western Railway express arrived at the Vienna Station, a young man alighted from a carriage and was going along the platform when he let fall a glass cylinder, which was found to be filled with what appeared to be red bonbons. On examination, however, by a chemist, it was discovered that the seemingly harmless sweets were composed of corrosive sublimate, and that each contained sufficient to cause the death of ten persons. It is believed that the young man who dropped this dangerous case of poisons came from Paris. He was not arrested at the time,

but the police are said to be diligently searching for him.

ACCIDENT IN AN ALUM VAT.—On Saturday, April 13, at Overton, Frodsham, Mr. Churton investigated the circumstances connected with the death of M. Joseph René Phulpin, aged 31 years.—A witness named Edward Owen, an employé at the Australian Alum Works, Rancorn, deposed that at 11.45 on Thursday morning he and M. Phulpin were draining off a vat of sulphate of alumina, the temperature of which was 185°. The vat was over 4 feet deep. M. Phulpin, wishing to bend a pipe, used a stick which was scarcely fit to bear a kettle. Witness was descending some steps to fetch an iron bar when he heard a splash. He ran back and found that the manager had been precipitated into the hot liquor through the breaking of the stick. He was promptly extricated, but his injuries were fearful, and he expired at three o'clock on Friday morning, which was his birthday. The drawing of the vat was not the duty of the manager, and witness would not have used a stick for such a purpose.—The coroner considered that to try to raise a heavy weight with a stick was most imprudent.—Mr. Linaker, solicitor, representing the bereaved family, said the deceased had admitted that he alone was to blame for the accident.—A verdict of accidental death was returned.

DRUGS FOR IRISH PAUPERS.—The fraudulent traffic in drugs for Irish paupers, which has been carried on for the last twenty years with the connivance of the Local Government Board for Ireland, is further developing. Emboldened by impunity and by the tacit acquiescence of the Government department whose duty it is to protect the sick poor and the ratepayers, traders in adulterated physics, and depreciated *materia medica* are becoming more audacious, while the guardians, sometimes bewildered and sometimes venal, pay, out of the ratepayers' pocket, monstrous prices for pharmaceutical rubbish, which, when it is not pernicious, is commonly useless. The newest departure in the drug jobbery market is the giving of drug contracts to traders who are neither apothecaries, pharmacologists, nor druggists. In one union the dispensary doctor has been made contractor for his own drugs and for those of neighbouring *confrères*. Whether or not such an arrangement is judicious, it can at least be said that the contractor is supposed to be a capable judge of the quality and price of the articles which he contracts to supply. The Carrickmacross Guardians have, however, beaten this record, for they have put aside every chemist or druggist who tendered, and have given the contract for drugs to the keeper of an ordinary unquestionable public-house named Daly. Will the Local Government Board stand this? It seems probable: the department could not remonstrate without offending Mr. Daly's relatives and friends, who might get some M.P. to assault the Local Government Board in the House of Commons. As the sick pauper has no friends in or out of the House of Commons, it is manifestly wise diplomacy for the Local Government Board to keep on Mr. Daly's side. Besides, the precedent will be useful, for it will admit of an indefinite extension of the guardians' patronage to the guardians' friend. It will be *en règle* to give the contract for paupers' boots to a popular ironmonger, or to get the union flour from the proprietor of the local newspaper.—*Medical Press and Circular*.

ARSENICAL POISONING IN GLASS FACTORIES.—An exchange relates a peculiar case of arsenic poisoning of the manager of a large flint bottle works in this state. He had been a flint worker and risen to the position of manager by industry and as a result of

his superior intelligence. Though not particularly robust, yet he had a good constitution, and, as he was not given to dissipation and his habits were regular, he enjoyed very good health. But not long after he became manager of the works his health began to fail. He grew thin and emaciated, lost energy, had no appetite, and finally had to drop his work at the factory, and not long afterwards died. His case was a puzzle to the physicians, but as no post-mortem examination was held the puzzle was not solved, but the solution came later. The manager who succeeded this one, and who was a man of exceptional health and strength like his predecessor, began to fail in health not long after he took charge, and his case was very similar to the one which had proved fatal. The physicians were again puzzled, but in applying blisters to the patient's chest the presence of arsenic was discovered, which gave the secret of the case. The patient was treated for arsenic poisoning and recovered. He had enough arsenic in his system to kill a dozen men if administered in regular doses. In these cases the poisoning was caused by carelessness. The manager had a small room where he kept his tools, books and chemicals, and among the latter arsenic. As he spent considerable time in this room, the breathing of the arsenic fumes had gradually impregnated his system with the poison, and this was the cause of his gradual falling in health. After the recovery of the manager the arsenic was kept in a room by itself and he enjoyed good health as before.

These cases go to show what great care should be exercised in the use of arsenic in glass factories, especially in flint works where it is used in considerable quantities. It should be stored in a cool place where there is no one at work, and should be handled carefully in making up the batch. With careful use it should not be injurious to the batch mixer, unless his system is especially susceptible to it, as some persons are affected by it in much greater degree than others. Managers and batch mixers should not forget that they are handling a very poisonous substance, and should take proper precautions accordingly.—*American Manufacturer*.

Technical Notes.

DETERMINATION OF SUGAR.—L. Grünhut has suggested a method with the view of decreasing the possibility of error in determining sugar with alkaline copper solution. As is well known, cuprous oxide is with difficulty completely oxidised, the result is consequently often too low. This is overcome by collecting the cuprous oxide on a tarred ashless filter and placing in a glass tube, and after burning off all organic matter by strongly heating in a current of air, the oxide is reduced to the metallic state by continuing the ignition in a current of dry hydrogen, and then weighed.—*Public Health*.

PROTECTION OF IRON AND STEEL FROM RUST.—Professor Calvert, according to *Invention*, has arrived at the conclusion that the carbonates of potash and soda possess the same property of protecting iron and steel from rust as do those alkalies in a caustic state. Thus it is found that if an iron blade is immersed in a solution of either of the above carbonates, it exercises so protective an action that that portion of the iron exposed to the influence of the damp atmospheric air does not oxidise, even after so extended a period as two years. Sea water, to which the carbonates in suitable proportions have been added, is said to produce similar results.

DETERMINATION OF CHLORINE.—As Mohr's method of determining chlorine, when applied to urine, gives too high results, owing to silver chromate being somewhat soluble in it, E. Böttker has devised a method which he claims, though rather more complicated, gives accurate results. The reverse of Mohr's method, he strongly acidifies the urine with nitric acid, adds an excess of standard solution of silver, and as only silver chloride is precipitated in the presence of nitric acid, he filters and carefully neutralises the filtrate with a weak alkali, and then titrates the excess of silver by standard solution of sodium chloride.—*Public Health*.

PREPARATION OF PURE TITANIUM.—M. Henri Moissan has recently succeeded in preparing titanium in a nearly pure state. This has hitherto been a matter of great difficulty. When the metal is prepared by the reaction of sodium or potassium on a haloid salt of titanium, the latter is always greatly contaminated, either by nitrogen—for which it has a great affinity, forming a definite compound—or with the sodium, potassium, or oxygen. The nitride of titanium is easily prepared in the electric furnace, in the form of a bronze-coloured mass, by strongly heating titanic acid in a carbon boat, using a current of 300 to 350 amperes at 70 volts. With a lower voltage an oxide of titanium is formed. The temperature at which this nitride decomposes is exceedingly high; but by means of a current of 1200 amperes at 70 volts M. Moissan has succeeded in obtaining a carbide of titanium free from nitrogen, using for the purpose a mixture of titanic acid and carbon. By repeating the operation in a crucible, the carbon not being in excess, an ingot is obtained of which the upper portion is an alloy of titanium and the carbide of the metal. By mixing this with a fresh supply of titanic acid and reheating again in the furnace with a current of 2000 amperes at 60 volts, a purification of the metal is effected, and a sample of titanium containing only about 2 per cent. of carbon is obtained. In this condition it is found to have a brilliant white fracture, and is said to scratch rock crystal easily. It is, however, brittle, and can easily be reduced to powder, but is the most refractory substance yet reduced by means of the electric furnace.—*Electrical Engineer*.

ARTIFICIAL RUBBER.—An artificial rubber of more or less strength may be obtained by dissolving four parts of nitro-cellulose in seven parts of bromo-nitro-toluol. Upon varying the proportion of the nitro-cellulose there may be obtained a material possessing elastic properties and much resembling india-rubber, and even gutta-percha. Nitro-cumol and its homologues may, if desired, be used instead of bromo-nitro-toluol. According to *Invention*, another substitute for india-rubber has lately been discovered by E. Desprez, of Paris. Gutta-percha, in the form of sheet, is taken and covered on one or both sides with a close-meshed fabric—even wire gauze will serve for some purposes—and the whole is glutomerated by pressure under heat. Sawdust, zinc dust, and other suitable and cheap materials may, it is understood, be incorporated with the gutta-percha.

DYE PRODUCTS BY ELECTROLYSIS.—Naphthazarin and intermediate products related to it, may now be prepared, says the *Electrical Review*, by means of electrolysis; and the fact is very suggestive. If one, why not all? Or, at least, a great many of those numerous substances which are now used in the important industry of dyeing? To prepare naphthazarin

a hot sulphuric acid solution of 1·1'—dinitro-naphthalene is submitted to the action of an electric current. 1 kilogramme of the mother substance is dissolved in 20 kilogrammes of acid, and the temperature is carried to 130° C., the vessel in which the operation is performed being provided with a porous diaphragm. The cathode is immersed in the hot solution, and the anode in sulphuric acid, the diaphragm separating both. A current of 15 amperes per square diameter is passed through the containing vessel until the mother substance has been completely converted into the intermediate product. The "melt" is then allowed to cool, and is worked up into a saleable product. The process belongs to the Badische Anilin and Soda Fabrik, a company that has probably paid more fees to the Patent Office than any contemporary corporation.

Patent Office Business.

APPLICATIONS FOR PATENTS.*

Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 6639.—Improved metal bottle-necks. April 1, 1895.
- No. 6707.—Improved focussing appliance for photographic cameras. April 2, 1895.
- No. 6725.—The production of nitric acid (HNO₃) and the nitrates of soda, of potash, and of lime. April 2, 1895.
- No. 6839.—Improvements in an appliance for drawing-off liquids. April 3, 1895.
- No. 6878.—An embrocation for the cure or alleviation of gout, rheumatism, neuralgia, and other ailments. April 3, 1895.
- No. 6887.—A new or improved medicinal compound.* April 3, 1895.
- No. 6903.—Indicator for showing kind of sensitive plate or film placed in photographic dark slide, and whether same is "exposed" or not. April 4, 1895.
- No. 6937.—An improved apparatus for tilting and emptying liquid measures. April 4, 1895.
- No. 7024.—A new or improved method of hermetically closing jars, bottles, and other vessels for the better preservation of their contents. April 5, 1895.
- No. 7050.—Improvements in liquid funnels. April 5, 1895.
- No. 7104.—Improvements in the production of photographs in natural colours. April 6, 1895.

PATENTS PUBLISHED APRIL 13TH.

Extracting gold and silver from ores (Nicholas, J.).—Refractory or other ores are treated with a solution of oxalic acid before treatment by the amalgamation, cyanide, chlorine, or other methods commonly used, or the oxalic acid may be used in conjunction with a hypochlorite to extract the gold by a single treatment. The inventor prefers to saturate the powdered ore with oxalic acid solution, after which a solution of calcium hypochlorite is allowed to percolate into and digest with it for an hour. The liquid is drawn off, and the gold is precipitated with stannous chloride. The silver chloride in the residual ore is removed by any suitable solvent. No. 3680 of 1894.

Ventilating and sterilising the air of hospitals (Brophy, M. M.).—The windows are kept permanently closed, and the walls, etc., of the wards are made of such material as will withstand a temperature of 700° or 800° F. without injury. The air from each ward is drawn into the flue of a furnace, and is thus sterilised before escaping, and

* From the *Illustrated Official Journal (Patents)*.

arrangements are made for introducing highly-heated air into the ward to sterilise the fittings from time to time. No. 7818 of 1894.

Bottle for aërated and other liquids (Kilsby, W.).—The bottle is provided with a hemispherical mouth, in which fits a spherical stopper provided with a handle and hinged to a strap fixed on the bottle neck. The stopper normally closes the bottle, but when it is turned into one position, a curved passage through it is brought opposite the bottle mouth, and the contents are discharged from a spout on the stopper. No. 8708 of 1894.

Cellulose acetate (Cross, C. F., and Bevan, E. J.).—Cellulose hydrate prepared as described in Patent No. 8700 of 1893, is mixed with a stated proportion of a saturated solution of zinc acetate, and is dried and heated to 110° C. It is then powdered and mixed in successive small quantities with a definite quantity of acetyl chloride, the temperature being maintained below 80° C. The zinc salts are removed by washing, and the residue is pressed and dried and dissolved in chloroform to free it from any unchanged cellulose. The inventors point out that this material is non-explosive, and that its chloroform solution serves as a substitute for collodion for surgical and other uses, as a varnish, and for mixing with oils for varnishing, etc. No. 9676 of 1894.

Disinfectant or antiseptic (Walker, J. T. A.).—The invention comprises the use of a solution of thymol in glycerin or glycerin and water in stated proportions, for use in the manufacture of soap, tooth powders, antiseptic washes, etc. The solution may be mixed with carbonate or sulphate of lime or other solid, to form a powder. No. 9726 of 1894.

Making nitric and hydrochloric acids (Campbell, A., and Walker, A.).—Relates to the use of acid sulphate of potash or soda, such as is obtained in the ordinary manufacture of nitric acid or by the inventors' method of adding dilute sulphuric acid or the mixed sulphuric and nitric acids obtained in various operations, to "salt cake," and evaporating at about 300° F. For making nitric acid, the acid sulphate is ground up with nitrate of soda or potash, and heated to from 400° to 450° F. The mixture is fed into the "still" by a hopper and screw, and the acid evolved is suitably condensed. Hydrochloric acid is similarly manufactured from common salt, the temperature used being from 600° to 800° F. No. 9783 of 1894.

Alloys (Vautin, C. T. J.).—Alloys of tin with sodium, potassium, lithium, calcium, barium, and strontium are obtained by electrolysis of a fused salt of the alkaline or alkaline earthy metal in an apparatus having a cathode of tin. No. 9878 of 1894.

Sterilising milk, etc. (Zweibohmer, F.).—The milk, etc., is placed in a vessel whose loosely-fitting cover is supplied with a liquid seal consisting of dilute glycerin. Any air which enters the vessel as the contents are withdrawn thus passes through the glycerin, and is "to a large extent cleared of germs." The contents of the vessel are sterilised by placing it for the required time in a vessel of boiling water. The vessel is fitted with a discharging tap and with an agitator for stirring, should the contents require it. No. 8767 of 1895.

Poisoning Cases and Inquests.

Carbolic Acid.—William Sterim, aged 46, died on Tuesday, April 9, in the Borough Hospital, Birkenhead, from the effects of carbolic acid, self-administered.

Chlorodyne.—William Reypert, aged 36, died on Friday, April 5, on board H.M.S. *Dreadnought* at Devonport, from the effects of an overdose of chlorodyne, self-administered. Verdict: "Deceased died from an accidental overdose of chlorodyne."

Caustic Potash.—Frederick Charles Hargreaves, about 2 years old, died on Thursday, April 11, in the Southern Hospital, Liverpool, from the effects of caustic potash. Verdict: "Death was the result of misadventure."

Oxalic Acid.—Emma Ridler, aged 43, died on Saturday, April 6, at Stroud, from the effects of oxalic acid, self-administered. Verdict: "Suicide from poisoning."

Laudanum.—Frederick Willett, aged 40, died on Saturday, April 6, in the West Ham Hospital from the effects of laudanum, self-administered.

Carbolic Acid and Naphtha.—Barbara Owen, aged 37, died on Monday, April 8, in the Borough Hospital at Bootle from the effects of carbolic acid and naphtha, self-administered. Verdict: "Deceased died from the effects of taking poison, but under what circumstances she took it there was no evidence to show."

Carbolic Acid.—On Saturday, April 6, at Broomhill Station, near Grantown, Macdonald, a surface man in the Highland Railway employment, went to a cupboard, poured himself out a glass of carbolic acid, and drained it off under the belief, as is conjectured, that it was spirits. Dr. Grant, Grantown, was summoned, but the man died within a couple of hours after the fatal draught.

Oxalic Acid.—John Speechley, aged 50, died on Friday, April 12, at 73, Sixhills Street, Grimsby, from the effects of oxalic acid, self-administered. Verdict: "Suicide whilst in an unsound state of mind."

Carbolic Acid.—William Sydney Moore, aged 70, died on Thursday, April 11, at 179, Wood Street, Kidderminster, from the effects of carbolic acid, self-administered. Verdict: "Suicide in a state of insanity."

Carbolic Acid.—Emily Strange Senior, aged 52, died on Wednesday, April 10, at 98, Lupus Street, Pimlico, from the effects of carbolic acid, self-administered. At the inquest, held on Tuesday, April 16, the coroner commented on the frequency of suicide by carbolic acid, and the fact that, the acid not being scheduled in the Poisons Act, there were no restrictions of any kind upon its sale. Verdict: "Suicide while of unsound mind."

Laudanum.—Thomas Dempster, aged 60, died on Sunday, April 14, in the Royal Infirmary, Glasgow, from the effects of an overdose of laudanum.

Trade Marks Applied For.*

No. 188,788.—BICARBONATE OF SODA FOR USE IN MANUFACTURES.—Bowman, Thompson and Co., Limited, 18, Harrington Street, Liverpool, Lancashire. November 21, 1894. Letters, "RIB."

No. 185,721.—ANTI-CORROSIVES.—Tolhurst and Son, 1, Bowling Green Lane, Farringdon Road, London, E.C. February 18, 1895. Device and initials of applicants. The essential particular is the combination of devices.

No. 185,110.—A MEDICATED PREPARATION FOR POULTRY AND OTHER BIRDS.—Dobbie and Company, Dobbie's Wharf, Old Bridge End, Leith, North Britain. January 24, 1895. Device: a group of fowls and the word "Vigorine." The essential particular is the device.

No. 183,278.—CONDENSED PEPTONISED MILK FOR HUMAN USE, AND FOODS FOR INFANTS AND INVALIDS PREPARED WITH CONDENSED PEPTONISED MILK, ALL THE SAID GOODS BEING SPECIAL PREPARATIONS INCLUDED IN CLASS 3.—Walter Henry Thew, Talbot House, Arundel Street, Strand, London, W.C. October 30, 1894. Word, "Zylak."

No. 186,119.—MEDICATED LOZENGES.—Clarks, Nickolls and Coombs, Limited, Hackney Wick Works, Hackney Wick, London. March 11, 1895. Word, "Klorinselikro."

* Compiled from the *Trade Marks Journal*.

New Remedies.

[The notes given under this heading for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects.]

NOSOPHENE IN CORYZA AND ECZEMA.—An iodo compound, tetra-iodo-phenol-pt halein, obtained by the action of iodine on phenol-pt halein, is used in the form of insufflation in acute coryza, chronic rhinitis and as a dusting powder for eczema. It is a yellow, odourless, tasteless powder, insoluble in water, soluble in ether and in chloroform. It contains 60 per cent. of iodine. It behaves as an acid, and combines with bases to form soluble salts. Nosophene is not toxic, and is said to pass through the body without undergoing decomposition, and therefore without giving rise to excretion of iodine in the urine (*Semaine Médicale*, March 27, 1895).

PARA-CHLORO-PHENOL IN LUPUS.—A paste composed of—

Para-chloro-phenol	} equal parts,
Lanolin	
Vaseline	
Starch	

applied to the ulcerations of lupus, previously well washed, causes rapid cicatrization. A 2 per cent. solution of para-chloro-phenol is also one of the best disinfectants for tuberculous sputa (*Pharmaceut. Centralhalle*, March 21, 1895).

URANIUM ACETATE IN CORYZA.—One drop of a warm solution of $\frac{1}{2}$ to 1 per cent. solution of uranium acetate in distilled water, dropped into each nostril and repeated two or three times a day, or a snuff consisting of 1 part of the salt with 100 parts of coffee in impalpable powder is employed with success in cases of acute coryza (S. Stein, *Pharm. Centralhalle*, March 21, 1895).

AMMONIUM SUCCINATE AS A UTERINE ANTISPASMODIC.—Dr. Remy finds succinate of ammonium of great value in cases of labour prolonged by the spasmodic contraction of the uterus. He exhibits it in the form of a solution of 1 gramme of the salt in 140 grammes of water, the dose of this being a tablespoonful every quarter of an hour until the spasm subsides. It is serviceable both at the first and second stages of labour (*Semaine Médicale*).

QUINOLINE RHODANATE, A NEW ANTISEPTIC.—Induced to experiment with sulpho-cyanhydric (rhodanhydric) acid, from the presence of that body in the saliva, which has itself certain antiseptic properties, Dr. Elinger has combined this acid with quinoline, producing pyridin-methyl-rhodanate. Solutions of this body, according to the author, have very energetic bactericidal properties, the specific microbes of cholera and diphtheria speedily succumbing to its influence. The solution is neither odorous nor caustic. A one per cent. solution has also been employed as an injection in gonorrhoea (*Semaine Médicale*).

VESICAL IRRITABILITY.—Dr. Schun states that when vesical irritation arises from an excess of phosphates in the urine, the following mixture alleviates the frequent desire to micturate—

Benzoic acid.....	8 grammes
Borax.....	7½ "
Water	225 "

(*Le Scalpel*).

CAFFEINE IN ASTHMA AND DISEASES OF THE RESPIRATORY ORGANS.—In spasmodic asthma or any morbid condition of the bronchial tubes, even in chronic bronchitis and emphysema, caffeine exercises a beneficial effect, more markedly so in the case of asthma. The citrate of caffeine is administered, either in solution or enclosed in a cachet, doses of 5 grains, being taken by an adult every four hours until the spasm is relieved, after which the remedy may be given at longer intervals to avert any tendency to relapse. In cases of attacks occurring regularly in the early morning, a dose of 5 to 10 grains at bedtime often suffices to avert or modify the paroxysm, and another dose on waking gives permanent relief (Dr. Markham Skerrett, *Practitioner*, April, 1895).

TERPENE HYDRATE AS AN EXPECTORANT.—Can be given either in pills or in a pill containing terpene hydrate, 8 grains, massed with sugar and gum acacia, or else in a mixture of terpene hydrate, 1 drachm, glycerin sufficient to dissolve, syrup of tolu to 2 ounces. One teaspoonful every three hours (*Practitioner*, April, 1895).

CHLORINE IN TYPHOID.—Dr. Wilcox states that chlorine can be taken in sufficient quantity to be antiseptic in cases of typhoid, without producing injurious effects. It stimulates respiration and the heart's action, and increases the flow of saliva and bile. By its action on the kidneys it assists in the more rapid elimination of the toxins. The writer uses doses of 1 to 4 drachms of chlorine water every two to four hours (*New York Med. Record*, February 9, 1895).

Obituary.

Notice has been received of the death of the following:—

On April 8, James T. Clarke, Pharmaceutical Chemist, Manchester. (Aged 45.)

On April 12, Dr. Thurstan Forshaw, Smalley, Derbyshire. (Aged 55.) Dr. Forshaw was a pupil of his brother, Mr. T. G. Forshaw, M.P.S., of Bradford, whilst that gentleman was dispenser to the North Staffordshire Infirmary, and subsequently commenced business as a chemist and druggist at Bolton. In 1864 Dr. Forshaw attended the course of lectures at the Ocombe Lying-In Hospital, Dublin, and graduated L.M. His business as an accoucheur became very extensive, and ultimately he proceeded to study at the Sheffield School of Medicine, and qualified as a medical practitioner, L.R.C.P. Edin. and L.S.A., 1871.

On April 12, F. J. Jackson, Chemist and Druggist, Bawtry. (Aged 70.)

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

MITTEILUNGEN, BOTANISCHE, AUS DEN TROPEN. 7 Hft. Brasilische Pilzblumen. Von A. MÖLLER. 11 marks. (Fischer, Jena.)

A PRIMER OF EVOLUTION, BY EDWARD CLODD. (Longmans, Green & Co., Paternoster Row, London, E.C.)

DISEASES OF THE HEART AND ARTERIES. By J. H. CLARKE, M.D. (Gould and Son, London.)

WAYSIDE AND WOODLAND BLOSSOMS. By E. STEF. (F. Warne and Co., London.)

Notes and Queries.

[The Editor will be glad to receive for publication notes of practical interest to pharmacists, and will also endeavour to furnish suitable replies to any queries that may be sent by readers.]

DIPHTHERIA ANTITOXIN.

[835.] The diphtheria antitoxin prepared by Behring and Roux is the most potent, and is obtained by long-continued injection of horses with large doses of pure toxin from diphtheria cultures. Klein, however, has been able to obtain blood serum possessing a powerful immunising action in respect to otherwise fatal doses of living diphtheria bacilli by injecting horses repeatedly with large doses of living bacilli of increasing virulence.

PRODUCTS OF DIGESTION.

[836.] There are, apparently, two kinds of peptone—hemi-peptone, which is split up by the pancreatic juice into leucine, tyrosine, etc., and anti-peptone, which is not so altered. Peptone is not precipitated by ammonium sulphate or nitric acid, like the albumoses, which are classified as proto-, hetero-, and deuto-albumose, according to their reactions and solubilities. Albumin probably consists of hemi- and anti-albumin. On hydration, the former is first split into proto- and hetero-albumose, whilst anti-albumin yields hetero-albumose and acid albumin. Deuto-albumose is next formed, and finally converted into hemi- and anti-peptone.

FLAVOURING SYRUPS.

[837.] The following recipes for syrup to flavour aerated water are taken from the *Era Formulary* (Haynes and Co., Detroit, Mich., U.S.A.):—*Chocolate Syrup*.—Chocolate of good quality, 2 lb.; granulated sugar, 3½ lb.; water, 6 pints; extract of vanilla, ¼ oz. Break chocolate into pieces and boil with water until free from lumps, stirring constantly; add sugar and dissolve, then strain through fine sieve; finally, add more water if too thick, or sugar if not sweet enough, and flavour with the vanilla extract when cold. *Coffee Syrup*.—Macerate coffee, 1 lb., with water, 3 quarts, over night, then steam for two hours and strain. After standing for about two hours, pour off clear liquid through muslin strainer, and make up to 1 gallon with water. Finally, dissolve granulated sugar, 9 lb. *Cream Syrup*.—Cream and milk, 1 pint each; sugar, 1 lb. Dissolve. *Milk Punch Syrup*.—Simple syrup, 1 pint; brandy, 8 oz.; Jamaica rum, 8 oz.; cream syrup, 1 pint. See also article on page 915.

FERRO-PRUSSIAN PAPER.

[838.] On ordinary ferro-prussiate paper—sensitised by treating paper possessing a smooth surface with a freshly prepared mixture of solutions of iron ammonio-citrate (5 oz. in 1 pint) and potassium ferrioyanide (5 oz. in 1 pint)—the prints show white lines on a blue ground. It is said that blue lines on a white ground may be obtained by sensitising with a fresh mixture of solutions of iron ammonio-citrate (1½ oz. to 4 oz. water), ferric chloride (1 oz. to 2 oz. water), and gum acacia (2½ oz. to 12 oz. water). After a shorter exposure than usual, develop by immersing in a saturated solution of potassium ferrioyanide, then in distilled water, next in hydrochloric acid (1 in 12), and finally wash well with water.

TOOTHACHE WAX.

[839.] The *Druggists' Circular* gives the following formula for this preparation:—Hard paraffin, 1 dr.; Burgundy pitch, 1 dr.; oil of cloves, 20 m.; creosote, 20 m. Melt the first two ingredients together, add the others when nearly cold, and make the mass into pills or small cones.

Trade Correspondence.

THE FIXATION OF PROPRIETARY MEDICINE PRICES.

Sir,—Will you allow me the opportunity to contribute a mite to the discussion going on in re above-named. Like Mr. Chapman, I have devoted a considerable amount of attention to the subject, and on the whole I must beg to differ from him and Mr. Allen as to the general desirability of anti-cutting schemes. Some five or six years ago a number of friends and I canvassed four or five hundred chemists in business in town and country to ascertain the prevailing view of the trade on the matter. The inquiry and its result were described in the *Pharmaceutical Journal* at the time, so it will suffice now to remind your readers that the great majority were in favour of restriction. Over eighty per cent. of those asked were willing to sign undertakings not to sell below a stated rate. The prevailing feeling seemed to be that the profit guaranteed should not be too much, because the transaction is a purely trade one (save where there is poison in the article) and it must be in accord with *fin de siècle* principles; also because any extensive attempt to "ride the high horse" would provoke resentment and retaliation on the part of the public.

Instead of joining with your correspondents in cold-douching the latest converts to pharmaceutical fair-trade, I desire to compliment Messrs. Allen and Hanburys on their pluck and public spirit. It is to be hoped they will be firm and impartial in enforcing their new trade conditions, and also that we retailers will not fail in gratitude to them for their trouble. Now that a great historic house has joined the "Progressives" is it too much to expect that others of the large firms will do likewise? It is worth their while to think it over just now when "fair pay" and "anti-sweating" are being so freely discussed everywhere. At the time referred to I wrote to a hundred of the best known makers of proprietary medicines, requesting to be informed if they were favourable to the idea of protecting prices. Most of them were at that time averse to it—partly, perhaps, because the idea was very new, and partly because of their dislike to trouble and re-arrangement. A few were strongly inclined to try one or other of the several schemes recommended, only they felt too timid to launch out alone. It may be that the good example now set them by a house so eminent, added to the other good examples that have arisen for their imitation during the last few years (Elliman, Burroughs, Blondeau, etc.), will stimulate them to action. I think they will find the bulk of the trade ready for an "alliance," "compromise," "burying of the hatchet"—call it what you like. Speaking personally, Elliman's "plan of campaign" has lessened friction and disgust, and troubled sales by chemists.

As regards the rate of profit that should be assured, 8d. in the shilling was suggested in my scheme, but I now think that a little too high. For several reasons 1½d. or 2d. is enough—for cash. The subject is tempting to pursue, only "1½d. in the shilling" does not warrant any greater expenditure of time this week.

Briston, S.W.

WILLIAM JOHNSTON.

Notices to Correspondents.

* * * Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

THE EARLY HISTORY OF PHOSPHORUS.

The term phosphorus was formerly applied to any substance which was luminous, either after exposure to light or after the application of heat, and the "phosphori," which received so large a share of attention, had no connection with the substance now known as phosphorus, and should rather be regarded as the ancestors of the luminous paints of to-day.

The peculiar, light-emitting property of the phosphori, however, secured to them so great a popularity among the dilettanti, that when the element was isolated, it was sold at a fabulous price, and was regarded by many as an important step towards the discovery of the divine arcanum by which base metals could be transmuted into gold. The value possessed by the so-called phosphorus (a sulphide of barium) of Balduin in the seventeenth century, is well shown in a letter from Christianus Adolphus Balduinus to Mr. Oldenburg, sent with a piece of "phosphorus" in a silver-gilt box for "His Majesty the Founder of the Royal Society" (*Phil. Trans.* 1676-7, vol. xi, No. 131, p. 788).

Although, with an unusual extension of the novelist's licence, Charles Reade makes one of the characters in the 'Cloister and the Hearth' use phosphorus in the fifteenth century, it was not until the year 1667, according to some authorities, or 1669, according to others, that it was actually isolated.

The discovery has been variously attributed to Brandt, Kraft, Kunkel, and Boyle. It would appear that either Brandt or Kraft was the original discoverer, but there is little doubt that Robert Boyle discovered it independently, for Kunkel himself stated that such was the case (see Kunkel's 'Laboratorium Chymicum,' p. 660, and Weigle's 'Geschichte des Wachthums und der Erfindungen in der Chemie,' v. i., p. 41). A paper deposited by Boyle with the secretaries of the Royal Society on October 10, 1680, and opened after his death, shows that he really obtained phosphorus from urine while the German process was still a secret (*Phil. Trans.*, 1692, v. 17, No. 196, p. 583).

Godfrey Hanckewitz, Boyle's assistant, appears to have been most expert in the manufacture, and is said by Thomson ('System of Chemistry,' 1817, v. i., p. 258) to have supplied all Europe for many years. According to Thomson, this phosphorus was known as "English phosphorus," but Hellot, who published the first complete description of the preparation, says that phosphorus was known throughout Germany as "Kunkel's phosphorus" (see 'Mémoires de Mathématique, etc., de l'Académie Royale des Sciences,' 1737, pp. 342 to 378). Hanckewitz gives a somewhat different version of the discovery of phosphorus, which will be found in the later portion of this article.

Probably the most reliable account of the discovery is that of Godfrey de Leibnitz in the 'Miscellanea Berolinensia' (1710, v. i., p. 91 to 98). According to this account "Brandt had fallen on a chymical process extant in a printed book, which taught how to prepare from urine a liquor fit to ripen a particle of silver into gold; and in labouring on this he found out his phosphorus. He had some acquaintance with Daniel Kraft, of the Council of Commerce to the Elector of Saxony; and by his means, with Kunkel, one of the said prince's bed chamber; but

who, under that character, performed chymical processes. On persuading Brandt that this arcanum might be sold to the great at a high price, and offering him their assistance, they obtained the composition from him. And upon going from Dresden to Hamburg they both saw and learned from him the process of the phosphorus. But Kunkel upon his return home had committed some mistake in the process, and for a long time could not hit upon the phosphorus, and he sent a letter to Brandt, complaining that the secret had not been sincerely communicated to him. But Brandt, repenting that he had been so easy in imparting the secret, delayed to satisfy him. Kunkel in the meantime, after various trials corrected the error himself, whence he pretended to be the inventor, and of this Brandt bitterly complained.

"Kraft, who was a man of good address, undertook to vend the discovery among the great; and, in his way to England he made a visit at Hanover, and ingenuously mentioned to me both the matter of the process and its author, Brandt; and he likewise showed the experiment of the phosphorus, to the great surprise of Duke John Frederic, and afterwards in England to King Charles II., Prince Rupert, the illustrious Mr. Boyle, and others, of which there is an account by Dr. Hooke. But he never, so far as I know, mentioned himself as the inventor. The phosphorus was first sent into France by me to Huygens, and at length the composition itself was by the illustrious Tschirnhausen, upon his return from Germany into France, communicated from me to the Royal Academy, to whom Huygens had already shown the thing. That Boyle had got but an imperfect description of it appears from his dissertation on phosphorus; for his phosphorus differs from Brandt's only in this, that it is more imperfect.

"But Duke John Frederic, as he was a magnificent and generous prince, ordered that I should send for the inventor. Brandt, therefore, came to Hanover and faithfully communicated to us the process, for whatever he did I imitated in another laboratory. Upon collecting a large quantity of urine, Brandt came to us, and went through the process. Upon Brandt's return to Hamburg the duke settled an annual pension upon him, which was punctually paid him till the duke's death; and this probably was the only considerable encouragement which he reaped from his phosphorus."

Dr. Kunkel's phosphorus or "noctiluca" was also described in the 'Philosophical Collections of Mr. Robert Hooke' (1681, No. 2, p. 8) by Dr. Sturm, who stated that Kunkel could extract phosphorus "out of any kind of terrestrial body whatever, as if it were there naturally placed."

Owing to the singular properties possessed by phosphorus, it occupied the attention of all the principal chemists whose writings are extant in the scientific literature of the period. Among these may be mentioned Tschirnhausen ('Anciens Mémoires de l'Académie Royale de Paris,' 1682, vol. i., p. 342), Homberg (*loc. cit.*, 1692, vol. ii., p. 135), Hofmann ('In Observationibus,' Hall's edition, 1722, p. 336), Theichmeier ('Elementa Philosophiæ Naturalis et Experimentalis,' 1724, p. 43), Nieuwentuit ('Existence de Dieu Démontrée, etc.,' p. 324), who obtained phosphorus from "old urine," which he collected from a hospital; Marggraf, who gave in the 'Miscellanea Berolinensia' (1743,

v. vii., pp. 324 to 344) a plate of figures showing the furnaces which he employed, and others whose work is referred to later.

According to Chambers' 'Encyclopædia' (1738), a Mr. Elzhelt published in 1676 a special treatise dealing with phosphorus, and the 'Aërial Noctiluca' of Boyle (1680), bearing on the subject, is well known.

The process employed by all the earlier investigators consisted in evaporating urine (which contains about 0.032 per cent. of phosphorus) to dryness and distilling the residue until the phosphorus passed over, and considering that the chemists of the period adopted the process of destructive distillation as the best means of ascertaining the composition of nearly all organic bodies, it is remarkable that the discovery was not sooner made. The most successful workers appear to have been those who were most experienced in the use of furnaces, but some of them laid great stress upon the source of the urine, and that of beer-drinkers appears to have been in especial favour. Boerhaave ('A New Method of Chemistry,' Translated by Shaw and Chambers, 1727, p. 196), however, says that the best is that from persons not much accustomed to drink wine.

Homburg mixed the dried urine with red bole, Boyle employed white sand, and Boerhaave powdered charcoal, but a very considerable improvement was introduced by Marggraf, who added lead chloride to the dried urine, and by Giobert, who first precipitated the phosphoric acid with lead nitrate and distilled the lead phosphate so obtained, with charcoal ('Annales de Chimie,' v. 12, p. 15).

The ignorance which prevailed among chemists as to the true nature of phosphorus is well shown in the following account from James' 'Medical Dictionary' of 1745:—

"Dr. Wall informs us that Mr. Boyle, being concerned to find how small a proportion of phosphorus was afforded by urine, desired him to look out for another subject that might afford it in greater plenty. The doctor afterwards causing a piece of dry matter to be dug up in the fields where night-men emptied their carts, he observed a great number of small particles of phosphorus therein. This matter the doctor immediately carried to Mr. Boyle, who set Bilgar, the chymist, to work upon it. But he could obtain very little phosphorus from it till another material was added to it in distillation, and then he procured phosphorus in such plenty that, selling large quantities at six guineas the ounce, he soon became rich, and left England." It should be mentioned that Bilgar was assistant to Boyle before Hanckewitz.

It is probable that, by the end of the seventeenth century, no substance had been so fully and accurately experimented upon, although the explanations of its action and the anticipations of its value were often expressed in almost ludicrous terms. Dr. Frederick Slare (Hooke's 'Philosophical Collections,' 1681, No. 3, p. 48, and No. 4, p. 84) says that it was then obtained as "transparent as any resin" and melted like wax in warm water. His remarks show that it was even then obtained in a state of great purity, and he finishes his paper by saying "what medical use may be made of this noble concrete time may discover," adding the hope that it may explain "certain phenomena of Nature, including the observation of the learned

Dr. Croone, who, on rubbing his body with a fresh and well-warmed shift, made both to shine."

An amusing example of the almost religious ceremony with which phosphorus was treated is found in the *Philosophical Transactions* (1733, vol. 38, No. 428, p. 55), where a description and an elaborate drawing of an apparatus employed for burning phosphorus is described by Dr. Frobenius, the companion of Hanckewitz. The phosphorus was ignited in a golden bowl, contained in another golden bowl on a tripod of the same metal, a glass bell-jar being suspended above to receive the "snow" which the combustion produced. The apparatus was described as the "Machina Frobeniana," and each operation was compared with one of the phenomena of Nature, the phosphoric anhydride to snow, and its deliquescence to the melting of snow. In this and similar experiments the learned doctor was in the habit of igniting the phosphorus with the heated tip of his sword.

Almost immediately afterwards, Hanckewitz (*loc. cit.* p. 58) showed that the Machina Frobeniana was unnecessarily elaborate, and repeated the experiment in a "warmed china cup." He mentioned the production of amorphous phosphorus as a "red caput mortuum" and gave a very complete description of his experiments, observing that "this phosphorus is a subject which occupies much the thoughts and fancies of some alchymists who work on microcosmical substances, and out of it they promise themselves golden mountains."

According to him, Kunkel, Kraft, and Brandt were only able to obtain a little "unctuous opaque phosphorous," and not the true hard "glacial" phosphorus. He considered that Kunkel either spoke too much at large or designed to impose upon the world, and stated that at the time of speaking he was the only man capable of making real phosphorus. Hanckewitz was undoubtedly the principal maker of phosphorus in his time and it is interesting to note that he was the founder of the firm of Godfrey and Cooke. A considerable amount of information on the work of Hanckewitz was given in a paper by Mr. Joseph Ince in the *Pharmaceutical Journal* (1859, pp. 126, 157, and 215).

The chemical properties of phosphorus were carefully studied immediately after its isolation, and the discovery that it increased in weight on burning, which is attributed to Marggraf, is said to have been in part responsible for the overthrow of the phlogiston theory, for Lavoisier showed that its increase in weight when burned in oxygen equalled the loss of oxygen. Lavoisier appears also to have been the first to definitely show that phosphorus was an element, and to point out its wide distribution throughout the vegetable kingdom (see Lavoisier's 'Elements of Chemistry,' Translated by Kerr, 1802, vol. i., p. 323).

Priestley also examined its action on burning in air ('Experiments and Observations on Different Kinds of Air,' 1790, vol. i., p. 170).

The action of phosphorus on metals was experimented upon by Marggraf, and later by Pelletier, who found that most metals combined with it when heated. Dr. Peter Shaw (James' 'Medical Dictionary,' 1745, article "Phosphorus") says that the "acid of phosphorus proves a menstruum to perhaps all the metals, but when this acid is driven into the pores of the metal by the action of the flame in burning the phosphorus, it seems pro-

ductive of much greater effects, as is well known to those connected with the sublimer metallurgy."

The production of amorphous phosphorus during the distillation of phosphorus was early known, but it was not recognised as a form of the element, but as an oxide. Aikin ('Dictionary of Chemistry and Mineralogy,' 1807) described it as "a brown red powder which diffuses itself in water like clay, and consists chiefly of phosphorus so peroxygenated as to be no longer combustible."

The modern method of preparing phosphorus is beyond the province of this article, but it may be mentioned that Gahn, a Swedish chemist, showed in 1769 that phosphorus was contained in bones (see 'Bergmann's Notes,' 1796, p. 203), and that the credit of preparing it from them appears to be due to Scheele. In 1775 he obtained it by treating bone-ash with nitric acid, precipitating the lime from the solution by addition of sulphuric acid, evaporating the solution and distilling the residue with charcoal. Nicolas and Pelletier (*Journal de Physique*, vols. 11 and 28) improved upon the process by dispensing with the use of nitric acid, and Fourcroy and Vauquelin (*Journal de Pharmacie*, v. 1, p. 9) determined the proportions most suitable for operations on the large scale. Aikin ('Dict. of Chem. and Min.,' 1807) mentions as a good yield, that Pelletier obtained 60 ounces of phosphorus from 576 ounces of bone-ash.

It was also common at the commencement of the present century to prepare phosphorus by precipitating the phosphoric acid from superphosphate of lime with lead nitrate, and distilling the phosphate of lead thus produced, with charcoal (Rees' 'Encyclopædia,' 1819).

THE SOLUBILITY OF QUININE IN ALKALIES.*

BY PROFESSOR E. DOUMER AND E. DERAUX.

(Concluded from page 918.)

EFFECT OF THE ALKALINE CARBONATES.—The exceptional behaviour of potash and soda, in relation to the solubility of quinine, has led us to think that the carbonates which accompany these alkalies must be the cause of it, and to make the following experiments:—

I. Effect of Sodium Carbonate.—In order to study the effect of carbonate of soda on the solubility of quinine in alkaline solutions, we have adopted a method similar in all respects to the preceding one, that is to say, we have determined the solubility of quinine by means of solutions, all of which contained the same weight of soda or ammonia and variable weights of carbonate of soda.

Table IV.—Soda and Sodium Carbonate.

Weight of caustic soda contained in 200 C.c. of alkaline solution.	Weight of Carbonate of sodium contained in 200 C.c. of alkaline solution.	Volume of solution of quinine absorbed.	Weight of anhydrous quinine absorbed.
0.0655	0	12.0	0.089
0.0655	6.815	6.0	0.045
0.0655	13.630	2.0	0.015
0.0655	20.445	1.3	0.009
0.0655	27.260	1.3	0.009

It is clear, judging from the figures contained in the preceding table, that the solubility of quinine in solutions of caustic soda diminishes in proportion as the solution becomes more carbonated.

It is therefore possible, from these first results, that the way in which commercial soda affects the solubility of quinine depends on the fact that this alkali is generally carbonated; we see, therefore, that if we work with a very dilute solution of soda, the amount of carbonate present in the soda being very small, the effect upon the solubility is very nearly *nil*; on the contrary, if we work with a very concentrated solution, the amount of carbonate is naturally greater, and consequently its influence in the solubility more marked. Whatever the value of this attempt at explanation may be, we can draw a practical conclusion of the highest importance from the preceding results; it is, that in order to obtain a most perfect precipitation of quinine by soda, it is best to use an alkaline liquid very much carbonated.

We also see, as a consequence of the foregoing, that when we wash the precipitate with distilled water, after having precipitated the quinine with solution of caustic soda, the first washings constitute a diluted solution of soda, and will re-dissolve a portion of the precipitate; we have there a source of error, as to the extent of which we can hardly be decided.

Table V.—Ammonia and Carbonate of Soda.*

Weight of ammonia contained in 200 C.c. of alkaline solution.	Weight of sodium carbonate contained in 200 C.c. of alkaline solution.	Volume of solution of quinine absorbed.	Weight of anhydrous quinine absorbed.
4.622	0	12.3	0.092
4.622	6.815	4.3	0.032
4.622	13.630	1.4	0.010
4.622	20.445	0.8	0.006

This table is exactly comparable to Table IV., and the same remarks are exactly applicable to it.

II. Influence of carbonate of ammonia.—Carbonate of ammonia gives results entirely different to those obtained with carbonate of soda, as the two following tables show:—

Table VI.—Soda and Carbonate of Ammonia.

Weight of soda contained in 200 C.c. of alkaline solution.	Weight of carbonate of ammonia contained in 200 C.c. of alkaline solution.	Volume of solution of quinine absorbed.	Weight of anhydrous quinine absorbed.
0.0655	5.125	18.7	0.139
0.0655	10.250	26.5	0.197
0.0655	15.375	30.0	0.223

In fact, we see from Table VI. that the solubility is greater in the solution of soda to which carbonate of ammonia has been added than in solution of soda alone. This fact was easy to foresee from another reason, because the soda displaces the ammonia, and thus gives rise to a weak solution of ammonia whose solvent power is greater than that of the solutions of soda used.

* From the *Journal de Pharmacie et de Chimie*.

Table VII.—Ammonia and Carbonate of Ammonia.

Weight of ammonia contained in 200 C.c. of the alkaline solution.	Weight of ammonium carbonate contained in 200 C.c. of the alkaline solution.	Volume of solution of quinine absorbed.	Weight of anhydrous quinine absorbed.
4.622	5.430	8.0	0.059
4.622	10.860	5.5	0.041
4.622	16.290	4.5	0.033

It is different with solutions of ammonia and carbonate of ammonia, because the solubility of quinine diminishes in proportion as the amount of carbonate of ammonia increases; but it will be noticed that this diminution is not nearly as great as when, other things being equal, we substitute carbonate of soda for carbonate of ammonia. The use of carbonate of ammonia to facilitate the precipitation of quinine is therefore to be rejected, and it is best, for this purpose, to give preference to carbonate of soda. We give an example which will illustrate the effect of carbonate of soda on the precipitation of quinine by the alkalies. Let us take for instance the precipitation of 1 gramme of quinine as sulphate dissolved in 100 C.c. water. If we perform the precipitation with 100 C.c. of pure ammoniacal solution of 4 or 5 per cent. strength we shall only precipitate 1 Gm. less 0.09 Gm. = 0.91 Gm.

If, on the other hand, we precipitate with 100 C.c. solution containing the same quantity of ammonia, and, in addition, 13 or 14 grammes of carbonate of soda, we shall precipitate 1 gramme less 0.01 gramme = 0.99 gramme quinine, that is to say, nearly the theoretical quantity. If we precipitate with soda we shall get quite analogous results, that is to say, we shall recover more quinine if precipitated by means of a mixture of soda and carbonate of soda than by the use of pure soda. In order, therefore, to obtain a more complete precipitation of quinine by alkalies, it is necessary to make an addition of sodium carbonate.

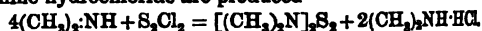
THE ACTION OF DIASTASE ON COLD STARCH PASTE.

BY H. T. BROWN, F.R.S., AND G. H. MORRIS, PH.D.

In a paper by Brown and Heron (*Trans. Chem. Soc.*, 1879, p. 627) it is mentioned that during the early stages of the action of diastase upon starch paste in the cold, the optical activity is lower than it should be on the assumption that only maltose and dextrin are present. After standing some hours, or on boiling, this discrepancy disappears, and the optical cupric-reducing powers show the same relationship that they do in conversions made at higher temperatures. An observation made by O'Sullivan and Tompson in another direction suggested an explanation of these abnormal results, and in the present paper the authors show that the lower angle of rotation observed during the earlier stages is due to the maltose being liberated in the state of "half rotation," a condition which freshly-prepared solutions of pure maltose always show. When freshly dissolved the optical power of maltose bears the relation to that of a boiled or old solution of about 133° to 150°, and the authors show that this relationship holds good in the case of freshly-prepared products from cold starch paste.—*Proc. Chem. Soc.*

NOTES ON RECENT SCIENTIFIC INVESTIGATION.

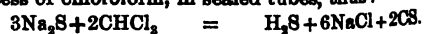
A NEW CLASS OF ORGANIC SULPHUR COMPOUNDS.—When sulphur monochloride, S_2Cl_2 , reacts with piperidine, $C_5H_{11}N$, a compound is obtained which may be regarded as a disulphide of the base, and has the formula $(C_5H_{10}N)_2S_2$. Michaelis and Luxembourg (Ber., 28, p. 165), have shown that a similar reaction occurs with the secondary aliphatic amines. By acting upon dimethylamine with sulphur monochloride in ethereal solution, the dithiodiamine and dimethylamine hydrochloride are produced—



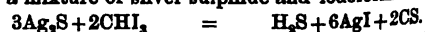
The corresponding ethyl compound was also prepared; they are both liquids, distilling undecomposed under reduced pressure, but decomposing when boiled at the ordinary atmospheric pressure. Acids decompose the compounds, yielding the salt of the secondary aliphatic amine, sulphur, and sulphurous acids. The dithiodipiperidine is a substance crystallizing in white plates from alcohol, and is more stable than the methyl and ethyl compounds, since it can be boiled with water without decomposition. Acids, however, effect the same change as with the above-mentioned substances. It is probable that all the secondary amines yield similar compounds.

NEW COMPOUNDS OF PHOSPHORUS, NITROGEN, AND CHLORINE.—H. N. Stokes describes in the *American Chemical Journal* a series of new compounds of phosphorus, nitrogen, and chlorine, and a series of acids derived from them. He finds that the chloro-phosphuret of nitrogen, $P_3N_3Cl_3$, discovered by Liebig in 1832, is a member of a homologous series the general formula of which is $(PNCl_2)_n$, and that the metaphosphimic acids of which they are the chlorides have the general formula $(PNO_2H_2)_n$. The compound $(PNCl_2)_4$ is almost as stable as $(PNCl_2)_3$, and yields an equally stable acid $(PNO_2H_2)_4$, on saponification. A higher chloride $(PNCl_2)_5$ possesses an oily character. Very large crystals of the triple compound, the corresponding acid of which has also been isolated, were deposited from benzene. They melt at 114°, whilst those of $(PNCl_2)_3$ melts at 123°.5 and boils at 256°.5. The acid produced on decomposition of the quadruple compound, by dissolving in ether and agitating in water, forms crystals of the composition $(PNO_2H_2)_4 \cdot 2Aq$. Soluble chlorides, nitrates, and sulphates are decomposed by this acid to form three series of salts.

CARBON MONOSULPHIDE.—This compound has been obtained by Dr. Deninger, of the Dresden Laboratory, by heating to 180° anhydrous sodium sulphide with excess of chloroform, in sealed tubes, thus:—



The new sulphide, which passes through caustic soda solution practically unaltered, is also evolved on heating a mixture of silver sulphide and iodoform thus:—



It is gaseous at ordinary temperatures, combustible, and rapidly absorbed by aniline, or alcohol. Ordinary freezing mixtures readily condense it to a clear, colourless liquid.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, APRIL 27, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brambridge, —17, Bloomsbury Square, London, W.C.

APPRENTICESHIP IN PHARMACY.

At the present day there is a very marked tendency in the United States of America to belittle the importance of "the education of the shop" in pharmacy, and a few irresponsible and ill-informed individuals in this country have adopted a similar tone. To those, therefore, who are capable of appreciating the advantages of the older system and consider it, when properly supplemented, capable of affording better results than can be obtained by any system of mere college training, however elaborate, the opinions expressed by Professor REMINGTON in the *American Journal of Pharmacy* for April possess a special interest. They are of the greater value, too, in that he prefaces them by asserting that there are yet thousands of conscientious pharmacists who do not consider those in their service as mere money-getting machines, but view them as the pharmacists of the future, with like responsibilities to themselves. He considers it as unfortunate, therefore, that attempts should be made to ignore the value of shop experience. The system proposed as a substitute, by which students may gain a diploma without being required to show proof of such experience, is stated to be an illogical and unwise one, for it is impossible for anyone to be fitted to fulfil the duties of a practical pharmacist without having had some experience in a pharmacy.

It is unreasonable to suppose that a pupil can serve four years in a shop and learn absolutely nothing. More or less unconsciously he is bound to acquire a mass of practical information which cannot be gained in any other way, and would be difficult to pick up after graduation. This is an inevitable result of apprenticeship, whether or not employers set to work to train their pupils systematically for their future career. "And is it possible," asks Professor

REMINGTON, "for one who has never served a day behind the counter, and yet passed a successful examination, to be expected to equal in efficiency one who has served four years and, in addition, had his college education and passed his examination besides?" Certainly not! most if not all practical pharmacists will reply to this, as well as to the further question whether it is advisable for colleges of pharmacy to throw away "this immense advantage which the pharmaceutical student possesses over all other professional students, of actually practising pharmacy, either before he comes to college or after he has entered it!" The diploma of a qualifying body must be more valuable if practical experience be required before graduation. Whatever self-classed educational reformers may urge to the contrary, pharmacists should maintain the only truly logical position and affirm that college work should supplement, not supplant, shop training. To ignore the value of the latter is to throw away an advantage of the first importance, and, as Professor REMINGTON prophetically remarks, when the pharmacist's work in the training of pupils is counted as nothing or worse than useless, then may we look for the decadence of pharmacy.

The same question has quite recently been dealt with from the medical point of view by Dr. J. G. GLOVER, in his presidential address to the North London Medical and Chirurgical Society. The old-fashioned system of apprenticeship in medicine has fallen into almost total disuse, but Dr. GLOVER considers that a certain amount of pupilage in general practice is of great importance in the curriculum of medical education. He and other leading medical practitioners have endeavoured, and with partial success, to get this truth recognised by the General Medical Council. "Just as men need to have lessons in hospital practice," he contends, "so they need lessons in general practice. The practice is quite different. The very cases are different, and their management and even treatment are different. But especially the cases are different. The great bulk of the cases that constitute general practice are conspicuous by their absence in the wards of a hospital, and would be considered uninteresting, so that it is possible for a distinguished student, and even one who may have been a resident physician and surgeon, on commencing general practice, to find himself in considerable difficulties alike of diagnosis and of treatment." In this education of the medical student in common diseases, that would result if pupilage in general practice were more common, Dr. GLOVER believes is to be found one of the best ways of meeting the unfair competition of "that arch-generalist, the prescribing chemist." Similarly, it may reasonably be maintained that by maintaining apprenticeship in pharmacy, and perhaps in that way only, pharmacists may expect

to hold their own against other traders. For, as regards the trade aspect of pharmacy, the chief factor of success is undoubtedly the possession of a sound business capacity, which should be acquired early rather than late in life, and cannot possibly be obtained by the longest conceivable course of college training, but must be gradually developed in the shop.

PHARMACY IN DENMARK.

In an article in the *Journal de Pharmacie et Chimie*, by A. WUNSCH, a Danish pharmacist, it is stated that there are 169 pharmacists in Denmark, Iceland, and the adjacent islands, i.e., about 1 per 13,577 of the population. Copenhagen, the capital, with a population of 312,859, has but 21 pharmacies, or 1 per 14,898 individuals. The licences to carry on business are either "real" or "personal." The former, none of which have been granted since 1842, number 89, and are identified with certain pharmacies which may be sold and bought with the licences attached. The purchaser must in any case be 25 years old, and possess a satisfactory diploma. Pharmacists in Copenhagen must have their diplomas endorsed "very good," whilst those who simply have the mark "good" may practise pharmacy anywhere else throughout the country, and those whose diplomas are marked "medium" only must be examined anew before they can practise.

The course of study is assisted upon extends over six years, three years as pupil in a pharmacy, one as assistant, and eighteen months at the school of pharmacy. According to the most recent legislation, all licences granted in future will be personal only, expiring with the death of the holder. The widows of deceased pharmacists are allowed, however, to carry on business provisionally, though for a long period, if a properly qualified pharmacist is in charge, and 18 out of the 81 businesses with personal licences now belong to widows. Both pharmaceutical and medical affairs are administered by a Sanitary Commission, under the direction of the Minister of Justice. The Commission is composed of nine doctors and two pharmacists. It regulates the official tariff for medicaments, decides what new pharmacies shall be opened, selects a list of three applicants for each vacancy, etc., etc.

There are said to be 1006 qualified pharmacists who have not yet been successful in obtaining the necessary licence, and more than half of them are therefore engaged abroad or occupy themselves with other occupations. Some 300 gain a living as assistants at a salary of 140 to 200 francs per month, and the average age at which they may expect to receive personal licences is 45 to 50. It is clearly advantageous, therefore, to be in a position to purchase one of the pharmacies

with "real" licences attached, though it is usually necessary to pay for such a sum equivalent to seven times the annual takings. As illustrating how the cost increases in course of time, it is stated that the Lion pharmacy in Copenhagen, which sold for 224,000 francs in 1835, realised 574,000 in 1889, whilst the price of a Jutland pharmacy advanced from 119,000 francs in 1835, to 714,000, in 1888.

PHARMACY LAW IN AMERICA.

ACCORDING to the *New England Druggist*, Mr. N. H. MARTIN's criticisms of American pharmacy have succeeded in drawing marked attention to American weaknesses in pharmacy as a nation, and it is stated that the natural sequence is now beginning to appear in suggestions for a remedy. "State pride and loyalty have prevented such a frank avowal of general weakness as Mr. MARTIN has proclaimed for us, but it has shown us very clearly that the strength of a profession, like that of individuals or physical objects, is gauged by its weakest part."

The favoured remedy appears to be a national pharmacy law. As is doubtless well known to our readers, the various States of the North American Union have pharmacy laws which are quite independent of each other, and are described as being dominated in most cases almost wholly by the interpretation placed upon them by the individuals who constitute the State Boards of Pharmacy. There is no central authority, like the Pharmaceutical Society in this country, and the variations in the educational requirements, etc., are so great that no State will recognise the certificates of other States.

The publication of a national pharmacopoeia, the organisation of a national association, and the establishment of a national formulary have done much to unite the various sections "in aims and ideals as well as in standards," and it is urged that it now remains for the United States to complete the national recognition of pharmacy by a national pharmacy law which shall govern all sections alike. "This," it is pointed out, "would mean a uniform standard of education, a common poison register, a better control of the liquor question, and a much greater stability in all matters pertaining to the laws."

DEATH OF AN ANNUITANT.

WE regret to announce the death, on the 16th inst., of GEORGE CHEETHAM, aged 82, chemist and druggist, formerly of Hope, near Sheffield. Mr. CHEETHAM was elected an annuitant on the Benevolent Fund in 1892.

ESSENTIAL OILS.

THE attention of our readers is specially directed to the important communication on essential oils, by Mr. J. C. UMNEY, part of which we publish this week. An enormous amount of work is represented in the published results, much of which will doubtless prove of considerable value to pharmacists generally.

Transactions of the Pharmaceutical Society of Great Britain.

EXAMINATIONS IN LONDON.

April, 1895.

(Concluded from page 921.)

MINOR EXAMINATION—PASS LIST.

Candidates examined	240
„ failed	177
„ passed	63

Cashmore, Montague.
Ibbotson, Oswald.
Pentney, Fred.
Pickford, Arthur Ferdinand.
Pratt, William.
Pryke, Harry Kenneth.
Read, Harold McLean.
Robinson, Ernest Temple.
Sayers, Frederick William.
Simmett, Herbert Frank.
Snell, William Kennard.
Smith, Rowland.
Sparks, Percy.
Stoddart, James George Young.
Tinker, Harold.
Usher, Alfred Musgrave.
Walmsley, Martyn.
Wells, Robert Joseph.
Widgery, Ernest.
Willson, Robert Wherry.
Yates, George William.

FIRST EXAMINATION.

Certificates by approved examining bodies were received from the under mentioned in lieu of the Society's Examination:—

Acton, James Rowland Fakenham
Acton, Victor Guernsey Fakenham
Castelow, Walter Thomas Leeds
Chandler, Martin William Swindon
Chapman, Edgar Marsh Scarborough
Daniels, Herbert J. Leicester
Davenport, H. J. London
Davies, Gwilym Dolwais
Dean, John Ashbourne
Hollingworth, Joseph Henry Pendleton
Hunt, George Paul Allen Ipswich
Jones, Thomas H. O. Upper Bangor
Lescher, Edward London
Lownsbrough, Robert E. Scarborough
Mackaness, Charles L. Thornbury
Moore, Herbert Richard Bath
Odgers, William Henry Wrexham
Oldham, G. W. N. Farnham
Payton, Alfred Brewerton Pannal Ash
Perrett, Frank London
Plowright, Alfred London
Rimington, Whitworth London
Robinson, John Eathorne Stone
Robinson, Walter Frederick. London
Scott, John Irwin Bootle
Smith, Frederick A. Upsher. Birmingham
Smith, Harry Broady Crewe
Taggart, Arthur Watson Whitehaven
Wilkins, George Sleeman Newcastle, Staffs
Williams, David James London

FIRST EXAMINATION RESULTS.

A meeting of the Board of Examiners for England and Wales was held on Wednesday, 24th instant.

The report of the College of Preceptors on the examination held on April 9 was received.

Three hundred and ninety-four candidates had presented themselves for examination, of whom two hundred and five had failed. The following one hundred and eighty-nine passed, and the Registrar was authorised to place their names upon the Register of Apprentices or Students:—

Alexander, Robert Arbroath
Anderson Campbell, Lewis G. Princes Risboro
Axford, Frank Stanley Manchester
Bailey, Daniel Jennings Denton
Bailey, John Harling Bournemouth
Barker, George Rodney Mold
Barkes, Arthur Fence Houses
Barlow, Joseph Alexander Burnley
Bayley, Arthur Wesley Brighton
Bayley, Leonard Lydd
Bell, Amys Jonathan Joppa
Bellamy, Sydney Charles Barnsley
Berry, Claudius Albert Belfast
Birtwistle, Albert Castle Northwich
Boon, Thomas Roberts Kirton-in-Lindsey
Bott, Stanley Leicester
Bridger, Percy George F. Southampton
Browning, Lætitia Frances Weymouth
Bull, William Robert W. Bath
Burden, Sidney Croydon
Burkinshaw, Alfred Belper
Cameron, John Sinclair Burton-on-Trent
Campion, John Ambrose Sheffield
Carmichael, Alexander Bridge of Allan
Carmichael, Graham Liverpool
Chambers, Frank Dawson Eastwood
Cheetham, Percy Louth
Chisholm, Alex. McIntosh Inverness
Churchill, Arthur Henry Birmingham
Clark, Charles William Kensal Rise
Cleasby, William Henry Morecambe
Cooke, Leslie Tucker Gloucester
Coull, George Buckie
Cox, John Wilfred Rotherham
Crecraft, Richard Preston Nottingham
Crossley, Edgar Belper
Cullingford, Horace Vince West Cowes.
Danson, Henry Horace Leicester
Davies, David Augustus Whitland
Desmond, Dennis William A. London
Dewhurst, George Edward York
Dixon, Ernest Rowlett Leeds
Draper, Lewis Blackburn Blackheath
Duckworth, Herbert Kingsley. Uiverston
Dunlop, Hugh Morton Carlisle
Dunn, George Market Drayton
Durbin, Herbert Samuel Putney
Dutch, Rose Tottenham
Eason, Samuel Bainbridge Liverpool
Evans, Nathaniel John Laugharne
Evans, Robert Harold Southport
Evans, Rowland George St. Asaph
Fairweather, Alfred Edward. Kingsbridge
Farmer, Samuel Reginald Longton
Farr, Minnie Redditch
Fear, Jared Livingstone Bradford
Ferguson, Thomas Walter Cumnock
Fletcher, Hartley Bramley
Forrester, Thomas Harrow Dysart
Foster, Thomas Lester Belfast
French, William Harry Shilton
Gammie, Alexander Lochgelly
Gilleghan, Herbert Barnaley
Gray, Alexander McKilligan Portsoy
Grayson, Harry Leeds
Green, Edwin Market Harborough
Griffiths, John Whitland
Hall, Albert Tuton Rochdale

Hall, Edward Percy Skegness
 Hands, Charles Bromley Chester
 Hannay, David Glasgow
 Harris, Annie May Merthyr Tydvil
 Harris, Solomon Sheffield
 Hawker, William H. Cambridge
 Hawksworth, John George Sheffield
 Hemming, Ernest Evan Bridgend
 Herbert, Auberon Reading
 Herd, Robert Stalk Kirkcaldy
 Higgins, Clement William Wem
 Hodges, Herbert Murray Darwen
 Holt, Henry Manchester
 Holton, Harry Neville Sheffield
 Hopkins, Claude Augustus Merthyr Tydvil
 Hughes, John Davies Manchester
 Hughes, Thomas Edward Mold
 Hulme, Jasper Edward Pendleton
 Humphreys, Ernest Bramwell Manchester
 Hutchens, Hugh Pashley Holt
 Hutchison, Arthur Stockton-on-Tees
 Ingle, George Edward Whittlesea
 Inglis, Robert Glasgow
 Innes, Joseph Green Aberdeen
 James, Ernest William H. N. Shields
 Jenkins, David Thomas Pembroke Dock
 Jewell, Frank Market Harborough
 John, Morgan Treorchy
 Jolly, Frank Humphrey Norwich
 Jones, David Llewellyn Llandudno
 Jones, David Pugh Ealing
 Jones, David Thomas Talgarth
 Jones, Thomas John Talgarth
 Jordan, Ernest Samuel Exeter
 Kennedy, Alexander Dumfries
 Kent Arthur Stanley Brighton
 Kerr, James Sunderland
 Knight, Alban Thomas Wootton Hole
 Laidlaw, Robert Ancrum
 Lakeman, Jasper Alfred Leytonstone
 Legge, William Alexander Norwich
 Lewis, David John Newport
 Lilley, William Robert Birmingham
 Lockerbie, James Blacklay Edinburgh
 Long, Francis Henry Fishponds
 Low, Charles Pearson Chester-le-Street
 Lowe, Frances Withenbery Bristol
 Macdonald, Charles Anderson Elgin
 Marcolyn, Henry M. Ramsgate
 Martin, Thomas Arbroath
 Matthews, William Cirencester
 Meakins, John James Dorking
 Menzies, Robert Blair Pitlochry
 Mercer, William Edinburgh
 Michie, John Thomas Kinross
 Mills, Frederick Charles Leicester
 Mitchell, Thomas Glasgow
 Muscott, Rowland William Birmingham
 Nixon, Kenneth Heckington
 Norton, William John Liverpool
 Oddie, Major Sidney Banbury
 Ormiston, Adam Wilson Edinburgh
 Owen, Ebenezer Denis Rhyl
 Parry, Bernard Powell Wymondham
 Payne, William Hedley Haverfordwest
 Pickering, Ernest Frederic Birmingham
 Pickering, Samuel D. Liverpool
 Porter, Robert Albert Wisbech
 Potter, John Lowthian Lazonby
 Potter, William Plaistow
 Pym, Ernest Henry Pontypidd
 Randall, Sophia Elizabeth Tottenham
 Richardson, Philip Market Rasen
 Robb, David Wallace Glasgow
 Roberts, Henry T. T. Welshpool
 Roberts, James Penzance

Roberts, William Henry Chester
 Robertson, George G. C. Carnoustie
 Robinson, Thomas Arthur Burnley
 Roch, Henry John London
 Ross, Albert Nottingham
 Ross, Robert Aberdeen
 Rosser, George Gethin Neath
 Russell, William Alexander Glasgow
 Saunders, Herbert Lewes
 Scott, John Wilson Birmingham
 Seeley, Charles Ernest Leonard Torquay
 Shaw, Arthur Victor Honley
 Shilcock, Sidney John Atherstone
 Smith, Foster Cleckheaton
 Smith, George Ennis Woodseton
 Smith, Harry Woodhouse
 Smith, Herbert James Lancaster
 Spencer, Herbert Southwark
 Spier, Edward Jenner Cheltenham
 Strange, Frank Alexander Hereford
 Strong, James Branford Deal
 Sutherland, Alexander Portsoy
 Swann, Henry Wm. Marriott Peterboro'
 Thew, George Richardson Hexham
 Thomas, Arthur Grisdale Barrow-in-Furness
 Thomas, David Jenkin Llanelli
 Thomas, Frank Holliday Boston
 Thomson, Charles Harry Liverpool
 Vance, John Sheffield
 Vibert, Samuel Howard Totnes
 Voice, Reginald Herbert East Grinstead
 Waters, William Landle Southport
 Watson, Charles Herbert Derby
 Watson, John Dumfries
 Watson, John Fraser Sheffield
 Waugh, Herbert Leedham Southport
 Wavell, Edward Tharle London
 White, James Albert Bradford
 Whyatt, Percy New Basford
 Williams, Joseph Bertram Liverpool
 Wilson, Erasmus Philip Bath
 Wilson, William Matthew Coventry
 Wright, John Edinburgh
 Yapp, Helen M. Birmingham
 Young, Walter Stockport

The questions set at this examination were published in the *Pharmaceutical Journal* for April 13, p. 897.

The following is a list of the centres at which the examination was held, showing the number of candidates at each centre and the result:—

Candidates.				Candidates.			
Exam-ined.	Passed.	Failed.		Exam-ined.	Passed.	Failed.	
Aberdeen	13	5	8	Lancaster	4	3	1
Aberystwith	2	0	2	Leeds	16	8	8
Birmingham	25	11	14	Lincoln	8	4	4
Brighton	6	4	2	Liverpool	22	16	6
Bristol	9	5	4	London	35	16	19
Cambridge	2	1	1	Manchester	30	12	18
Canterbury	2	2	0	Newcastle-on-T.	12	4	8
Cardiff	14	7	7	Northampton ..	5	3	2
Carlisle	9	6	3	Norwich	6	4	2
Carmarthen	16	8	8	Nottingham	19	11	8
Carnarvon	2	2	0	Oxford	6	2	4
Cheltenham	4	4	0	Penzance	5	1	4
Darlington	8	1	7	Peterborough ..	9	4	5
Dundee	7	4	3	Plymouth	4	2	2
Edinburgh	26	10	16	Sheffield	12	9	3
Exeter	7	3	4	Shrewsbury	11	3	8
Glasgow	14	8	6	Southampton ..	7	3	7
Hull	4	0	4	Worcester	1	0	4
Inverness	4	2	2	York	8	1	1

Pharmaceutical Society.

NORTH BRITISH BRANCH.

MEETING OF THE EXECUTIVE.

A meeting of the Executive of the North British Branch was held in the Society's House, 36, York Place, Edinburgh, on Friday, April 19, at 12 noon, Mr. J. Laidlaw Ewing in the chair.

Present—Messrs. Currie, Davidson, Ewing, Fisher, Henry, Johnston, Kermath, Kerr, Lunan, McAdam, Nesbit, Noble, Storrar, Strachan, and Sutherland.

Apologies for absence were received from Messrs. Hardie and Kinninmont.

The minutes of last meeting were read and approved.

General Purposes Committee.

The report of the General Purposes Committee dealing with details of the opening of the new premises and the evening meetings was read and adopted.

The CHAIRMAN explained that the removal of the examination and evening meeting work to the new premises necessitated some rearrangement of the older part of the Society's premises. He suggested that they should appoint a small committee to look into the matter and prepare a report for consideration by the Council.

Messrs. Ewing, Lunan, and Nesbit were appointed a committee for this purpose.

Annual Report.

The Executive went into committee to consider the annual report of the Council, and, on resuming,

Mr. KERMATH moved that the report be adopted and forwarded to the Council. He said he thought they could congratulate themselves on being able to make a satisfactory report. He was delighted to hear that the plan of appointing teaching examiners had proved so far successful. There could be no doubt such a step was desirable, and it was gratifying to find it had resulted as reported.

Mr. FISHER seconded the motion, and it was unanimously agreed to.

Votes of Thanks.

Mr. STORRAR said before leaving the subject of the annual report he thought they should agree to insert in their minutes their thanks and sense of appreciation of the great amount of work that had been done by the Chairman and the Assistant-Secretary in connection with the erection and opening of the new premises. He therefore moved that that should be done.

Mr. KERR, Vice-Chairman, said he had great pleasure in seconding the motion. Being a member of the General Purposes Committee he had an opportunity of seeing really how large an amount of work had to be done.

The motion was cordially agreed to, and the Chairman briefly expressed his thanks.

Election of Executive.

On the motion of Mr. Sutherland, seconded by Mr. Davidson, it was agreed:—

"That the next election of Executive take place on Friday, June 21, and that the Chairman and Vice-Chairman be appointed scrutineers of the voting papers, with power to add to their number."

The Metric System.

A letter was read from the Secretary to the Edinburgh Decimal Association, asking the Executive to forward a resolution in favour of the general adoption in this country of the metric system, legalised by the Weights and Measures Act, 1878, to Sir Henry Roscoe, M.P., Chairman of the Select Committee of the House of Commons on Weights and Measures.

It was decided that, in view of the fact that this matter had already been considered by the Council, and that the President had been appointed to appear as a witness before the Parliamentary Committee, no action should be taken.

The Sale of Methylated Spirit.

Mr. SUTHERLAND said he would like to bring before the Executive the subject of the sale of methylated spirit by medical prescription on Sundays. He thought the Inland Revenue should be communicated with so as to have some clear understanding of their position. In his district some chemists had been supplying the spirit in such cases and forwarding the orders to the Revenue authorities, but there was a doubt whether that was the right thing to do. He believed Revenue officers were attempting to get sales of methylated spirit on Sundays by the use of fictitious medical orders to see if chemists were keeping the law.

The CHAIRMAN said a notice was printed in a recent *Chemist and Druggist* Diary, indicating that in such cases the Inland Revenue authorities would not interfere. He thought they were quite safe with such an arrangement.

Mr. CURRIE said he had heard of such cases as Mr. Sutherland referred to having happened in various parts of Glasgow. He had himself been applied to by a Revenue officer whom he happened to know and whom he, of course, did not supply.

Mr. NESBIT said he had been applied to for spirit for a bronchitis kettle frequently. In such cases he got the doctor to mark the purpose for which the spirit was required, and he then supplied it. He did not think chemists would be interfered with in such cases any more than publicans or spirit merchants who supplied liquor by medical prescription on Sundays or at other prohibited hours.

Mr. HENRY said one chemist had supplied the spirit and sent word to the Revenue of what he had done, but no notice was taken.

Mr. STORRAR said this was a matter in regard to which the less that was said the better. There had been no interference and no prosecution.

The subject then dropped.

Examination Business.

Mr. STRACHAN drew attention to the fact that addresses of Major and Minor candidates were not now published in the Journal, and it was remitted to the Scottish members of Council to see if the old method could not be continued.

The meeting then closed.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of this Association on April 25, the following paper was communicated:—

ESSENTIAL OILS IN THEIR RELATION TO THE BRITISH PHARMACOPOEIA AND TRADE.

BY JOHN C. UMNEY.

The title of this paper indicates the scope of the subject which I have chosen to bring before you this evening, and makes it evident at the outset that a considerable portion of it cannot possess any claim to originality. The revision of our national Pharmacopoeia in the near future, combined with the unsatisfactory condition of essential oils as met with in trade, induced me to consider how nearly the requirements of such a work might be made to accord with the physical and chemical characters of the purer commercial products. It would obviously be unjust to compare the British Pharmacopoeia of 1885 with the German Pharmacopoeia of 1890, or the United States Pharmacopoeia (1890), official from January 1, 1894, as in the interval between the respective dates of publication of these works enormous strides were made in the study of the constitution of essential oils. It is not, on the other hand, contended that the British Pharmacopoeia of 1885 contained all the characters and tests for these bodies available at the time of its issue, but an endeavour was made to secure uniformity by the insertion of the words "distilled in Britain" as a requirement in the case of the majority of the essential oils. Such restriction is undesirable from every point of view, except in those cases where the climate or soil influence for the better the character of the oil obtained from the plants of the same species, as appears to be the case with lavender and peppermint when cultivated in Britain.

One treads on dangerous ground in discussing the scope of a national pharmacopoeia, and in urging that it should contain not only essential oils that have value in medicine, either directly by their action or as flavouring agents, but also others for which, owing to their extensive employment in pharmacy, it is desirable to set up standards of purity. This seems desirable, however, if the British Pharmacopoeia is to be recognised as a legal standard by which the requirements of a "Sale of Drugs Act" may be enforced with something approaching uniformity. It is gratifying to note in this connection, therefore, that the last editions of the pharmacopoeias of both the United States and Germany include oils of bergamot and rose, whilst the tendency to exclude certain oils, the active ingredient of which is contained in them in common with, but in less proportion than, others that are made official, is rather to be deprecated. If the lead of the two pharmacopoeias under notice in excluding cinnamon oil in favour of cassia oil, presumably in view of its lower average content of cinnamic aldehyde, were followed up in a new B.P., it would lead to the removal of dill and pimento oils in favour of those of caraway and clove, whilst if the value of eucalyptus oils was proved to be due to eucalyptol, cajuput oil, with its larger percentage of that body, might replace it. The pharmacopoeial description, characters, and tests should embody in every instance: (1) the source of the oil, defining, if possible, the precise species to be used should more than one species be capable of employment; (2), range of specific gravity at 15° C., or at such other temperature as may be convenient in the case of oils solid or partially so at that temperature. In addition to these general requirements it seems desirable to add more extended physical tests where such are capable of indicating purity or otherwise, and in some instances quantitative as well as qualitative

chemical tests, where the former may be conveniently employed for ascertaining the proportion of any well-defined body on which the value of the oil is dependent. The following are suggested as more generally applicable:—

Optical Rotation.—Conveniently expressed for uniformity as the rotation observed at about 15° C. in a tube of 100 Mm. in length.

Solubility in alcohol of various strengths or other solvents which indicate distinguishing characteristics.

Boiling Point.—As showing range of some approximately constant constituent.

Chemical Tests (Qualitative).—Such as absence of acidity (frequently indicative of age or oxidation) or reactions showing presence of well-defined chemical bodies (phenols, aldehydes, etc.).

Chemical Tests (Quantitative).—Such as the determination of aldehydes, phenols, etc., by processes sufficiently simple to be easily applicable.

The use of the following oils is suggested to suggest their exclusion from a new British Pharmacopoeia:—Chamomile, copaiba, rue, savin, and possibly spearmint, whilst the inclusion of those of bergamot, bitter orange, rose, and possibly synthetic winter-green oil (methyl-salicylate) are recommended for reasons which will be specifically referred to subsequently.

The trade aspect of essential oils cannot be said to be complimentary to British industry, and it may truthfully be urged that in few branches of the manufacturing pharmacist's calling has less progress been made during recent years than in the distillation of essential oils in England. Almost the whole of the scientific research on these complex substances and the chemical nature of their principal constituents has been carried out on the Continent, principally in Germany, and this has tended to increase considerably the import trade of this country in essential oils. It is true, however, that another important factor has contributed even more to this increase, the unfortunate word "price." The employment of essential oils in enormous quantities for soap scenting, culinary and other industrial purposes by others than pharmacists, as well as, it may be added, for cheap veterinary medicines, has done much to swell the traffic from the Continent, principally France, in cheap, impure oils; and the enormous imports of spike lavender, juniper wood, rue, savin, and bitter fennel oils consisting to a very large extent of turpentine, are unfortunate instances of such trade. The words "distilled in Britain" it is true have to a very considerable extent kept up the standard of essential oils used for pharmaceutical purposes, as the distillation has been almost confined to a few firms of repute. The time has now come, however, when scientific knowledge must be applied, as well as commercial honesty to such manufacture; and it is for that reason that such tests for excellence, as well as purity, as are not above the reach of oils carefully distilled from properly selected material, should be included in a new British Pharmacopoeia.

It seems desirable to record an objection to the trade use of factitious oils, as a type of which may be taken rhodium oil. This oil is no longer distilled from true rhodium wood, and all attempts to obtain the genuine wood for distillation have been unsuccessful. Its use, as well as that of others of the same class, cannot therefore be too strongly condemned, as their composition must of necessity show the greatest variation.

In the following summary of the principal essential oils handled by pharmacists, I have endeavoured to place before you the more interesting results obtained from examination of trade samples during the past three years. Where any great discrepancy has appeared to exist between the oils of commerce and those of believed purity I have distilled oils from average material, in order, if possible, to ascertain the

cause of such differences. In presenting the following notes, which must of necessity be very imperfect, owing to the immense field covered, I desire to express my thanks to my brother, Ernest A. Umney, as well as two of my firm's analytical assistants, Messrs. Braithwaite and Swinton, who have helped me considerably in the experiments necessary for this paper.

Anise Oil.—The official description of this oil, which recognises the oils of both anise fruit and star-anise fruit, differs in this respect from that of almost all the pharmacopœias, the latter being unofficial in the United States and Continental pharmacopœias.

In a paper which I published in the *Ph. J.* [3], xix., 648, 649, attention was drawn to the fact that almost the whole of the anise oil of British pharmacy was the Chinese star-anise oil, and for this reason the word "ordinary" in the official description, as applied to anise-fruit oil, is misleading and needs amending. Attention was called in the same place to the range of difference between the normal and abnormal congealing points of the two oils, which is more marked in the case of the star-anise than anise fruit oil, and is affected by the age and oxidation of the oils. The difficulty of fixing on this account a satisfactory congealing point has caused the adoption in the German Pharmacopœia of the melting point of the oil after freezing as the most constant factor, which, it is required, should be at 15° C. This has been subsequently commented on favourably by Squire (*Ph. J.* [3], xiv., p. 104) and Schimmel in their half-yearly report, October, 1894, who state that the melting point should not be, at any rate, below that figure.

The specific gravity of ten samples of oils of both anise fruit and star anise examined varied between .975 and .990 at 15° C., and yielded on fractionation from 80 and 85 per cent. boiling between 225° C. and 235° C., corresponding to nearly that percentage of pure anethol. The optical rotation of the oils examined varies between -1 and -3 at 20° C., being in the opposite direction to that of fennel, which is dextro-rotatory to the extent of about +20 in a tube of 100 Mm. Should necessity arise to distinguish chemically between the two oils, and in consequence of the frequent difference in their market value such may be the case, recourse may be had to the colour reaction with a saturated solution of hydrochloric acid gas in absolute alcohol, which affords with anise oil a rich blue, but with star-anise oil a yellowish or brownish colour. (Squire, *ibid.*)

It is suggested that the official description in the new British Pharmacopœia should embody the following points.

Source.—*Pimpinella anisum*.

Illicium anisatum.

Specific Gravity.—.975 to .990 at 15° C.

Melting Point.—After solidifying should not melt below 59° F. (15° C.).

Distinguishing test.—The anise fruit oil affords with saturated solution of hydrochloric gas in absolute alcohol a blue coloration, which is not yielded by star-anise oil.

Bay Oil.—The oil of bay usually met with in commerce consists of a mixture of the heavy and light oils distilled from the leaves of *Myrcia (Pimenta) acris*. When the oil was first introduced into this country for the purpose of manufacturing bay rum, in consequence of the requirement of the United States Pharmacopœia of 1880, that it should have a specific gravity of about 1.040, it was customary to find a product consisting principally of the eugenol-containing fractions, and having a gravity of 1.025 to 1.050 at 15° C.

Latterly, however, the heavy and light fractions mixed in various proportions have been employed, and the requirements of the United States Pharmacopœia have been modified accordingly, the specific gravity

being reduced to "from .975 to .990 at 15° C.," and tests added for the absence of clove and pimento oils.

The peculiarly pleasant odour of the lighter fractions is thus added to the valuable antiseptic properties of the heavier fractions, which makes the oil one of considerable value.

The samples examined during the past three years show very great variation as regards specific gravity and percentage of eugenol present, several examined fell as low as .940, whilst one which contained a considerable quantity of oil of verbena had a specific gravity of .9256 at 15° C.

The finest sample examined had a specific gravity of .981, and contained 62.5 per cent. of eugenol when estimated by the process, which will be described under oil of cloves. It formed a clear solution in alcohol of 90 per cent. strength, and showed no indication of oils of pimento or cloves when treated by the United States Pharmacopœia test for these oils.

The following table indicates the chief differences between types of the oils rich in eugenol and the lighter oils, all the latter of which, with one exception, appear to be unadulterated, but consist only of partially-bulked fractions of the oil obtainable from the leaves:—

OIL	Description.	Sp. gr. at 15° C.	Percentage of Eugenol.*
1	Fair	.9599	47.5 per cent.
2	Fine	.9818	62.5 "
3	Light	.9424	33 "
4	Light	.9502	34 "
5	Adulterated with oil of verbena.	.9256	26 "

The characters and tests of the United States Pharmacopœia are those, therefore, to which the fine oils respond, and may be adopted as a standard of excellence for this oil.

Bergamot Oil.—The investigations of Schimmel and Co. on the Sicilian and Calabrian essential oils have been most fruitful in stopping the sophistication of these oils, and the method devised by them for the estimation of the odorous constituent of this oil is both accurate and convenient. Linalyl acetate, to which this oil probably owes its aroma in entirety and many others, in part, at any rate, is readily saponified by means of alcoholic potash by boiling for two hours in a water bath with a reflux condenser, and the excess of potash after complete saponification titrated with volumetric sulphuric acid solution. The outline of the method is contained in Schimmel and Co.'s report, October, 1892, p. 36, and details of the process are given in their report, October, 1894, p. 61, together with tables for the ready calculation of ester-content from the saponification figure.

In an examination of a considerable number of bergamot oils, the highest proportion of linalyl acetate I have obtained has been 42.7 per cent., but the percentage in many samples of commercial oil falls to 31 to 32 per cent., four such samples being included in appended table. Schimmel and Co. state 38 per cent. as a minimum proportion for a genuine pressed bergamot oil, the percentage being but slightly diminished by keeping the oil for a considerable length of time.

* Since the above was written the existence of other phenols than eugenol has been shown, and Schimmel and Co. in their last report (April, 1895) have adopted the process for the estimation of them in this oil, which I have found yield such useful results in the case of the eugenol-containing oils, more especially that of cloves. The words "percentage of eugenol" should therefore read "percentage of phenols."

The specific gravity at 15° C. of those oils examined which contained the highest percentage of linalyl acetate varied between .883 and .885, whilst the poorer oils fall as low as .875, which points to admixture with lemon oil.

The behaviour of the oil towards alcohol of 80 per cent., which was a test more generally employed in England before the ester estimation process was devised, is a means of confirming the presence of orange or lemon oils. Pure oil of bergamot, from which the greater part of the stearepten has been deposited, dissolves in twice its volume of alcohol of this strength without the separation to the bottom of oily drops. In recently pressed oils, however, the separation of the stearepten makes the result difficult to observe.

The observation of the rotation of the oil is sometimes attended with difficulty, owing to the dark colour of the oil, but by filtration through charcoal, a part of the colour is removed and the process rendered more easy.

The rotation in a column of 100 Mm. should not be more than +15 at about 15° C., adulteration with orange oil to the extent of 15 or 20 per cent. raising this figure to +30 or +35; whilst an addition of 10 per cent. of lemon oil raises it to +22, or of 20 per cent., to nearly +25.

The probable condition of purity of the samples is indicated in the table, numbers 1 to 4 inclusive being pure specimens of slightly different quality.

I have not in any case proved the presence of fatty oils, for the detection of which the United States Pharmacopœia states as a limit that the oil should not leave more than 6 per cent. of residue when evaporated on a water bath, all the samples yielding approximately the same percentage.

Although, therefore, the oil is not actually employed in medicine, it is largely used by pharmacists for other purposes, and doubtless it is on this account alone that it is included in the United States Pharmacopœia. It might be desirable, therefore, to include the oil in the new B.P., and by that means set up a standard for its purity and excellence, which might be somewhat as under:—

Specific gravity at 15° C.—.882 to .886.

Solubility.—In twice its volume of alcohol of 80 per cent. strength by volume.

Rotation.—Not more than +15 in 100 Mm. tube.

Residue.—Not more than 6 per cent. when evaporated in a water bath.

Percentage of linalyl acetate.—Determined by the process recorded above, not less than 38 per cent.

Cajuput Oil.—The British Pharmacopœia describes this oil as the produce of *Melaleuca minor*, whilst the United States Pharmacopœia ascribes it to *Melaleuca leucadendron*. Other species are also known

to yield similar oil, and recently it has been stated that the oil of commerce is distilled exclusively in the comparatively small island of Bouru.

Most of the samples of oil examined during the past three years have varied in specific gravity from .922 to .927 at 15° C., and have shown by fractionation from 55 to 65 per cent., of cineol (eucalyptol). Two samples recently examined show a much smaller percentage, only 30 and 22 per cent. respectively, and it appears probable that a portion of the cineol has been abstracted for sale as eucalyptol or for increasing the percentage of that body in eucalyptus oils of low eucalyptol value.

The oils show the usual indications of copper by ferrocyanide of potassium, except in the case of re-distilled oils.

Notwithstanding that the oil is employed principally for external purposes, it seems desirable to frame such characters and tests as shall only include a natural oil—

Specific gravity.—.922 to .927 at 15° C.

Presence of a large proportion of cineol should cause it to become semi-solid on addition of syrupy phosphoric acid, 1.750.

Caraway Oil.—In no essential oil, perhaps, do greater differences as regards quality and commercial value exist than in oil of caraway. The three kinds usually met with in trade in this country are:—

Light oil of caraway (caraway "chaff" oil so-called)

Oil of caraway from German seed.

Oil of caraway from Dutch seed.

The last named commands about five times the price of the "chaff" oil, and about 10 per cent. more than the oil distilled from German seed.

The requirements of the British Pharmacopœia that the oil shall "be distilled in Britain" is not in itself sufficient to ensure uniformity as the variety of seed employed yields oil differing in the proportional content of carvol, the principal constituent, the difference in that percentage being greater in oils from German and Dutch seeds than the variation in price already referred to. Doubtless, having in view this divergence in the German Pharmacopœia, *Hil.*, pure carvol has been made official.

Unfortunately a considerable proportion of the oil used in this country, and imported from Germany, is not employed for pharmaceutical purposes. In the case of the oil from Dutch seeds, as well as the dill fruit oil, which will be subsequently referred to, they appear to be frequently partially "decarvolised" to meet the Continental demand for pure carvol.

The United States Pharmacopœia requires the oil to have a specific gravity of .910 to .920 at 15° C., and the lower limit is certainly one below which the oil should not be allowed to fall.

Oil of Bergamot.

	Sp. gr. at 15° C.	Percent- age of Linalyl Acetate.	Rotation in Tube of 100 Mm.	Solubility in Alcohol of 80 per cent.	Residue per cent.	Probable Degree of Purity.
1.	.8832	42.7	+14.25	Soluble (contained steareptene)	5.1	Pure (fine)
2.	.8845	42.3	+10.75	Soluble	5.2	Pure (fine)
3.	.8839	41.8	+13.75	Soluble	5.1	Pure (fine)
4.	.8859	37.1	+14.0	Soluble	5.3	Pure (medium quality)
5.	.8740	32.9	+22.75	Not soluble	5.4	10 p. c. of lemon oil at least
6.	.8795	32.2	+17.25	Not soluble	4.9	Very Doubtful
7.	.8812	33.6	+20.5	Not soluble	5.1	7-10 p. c. of lemon oil
8.	.8812	33.9	+16.5	Not soluble	5.1	Very Doubtful

The estimation of the carvol by means of phenylhydrazine has not been found to yield reliable results, but the fractionation, under precisely similar conditions, shown in the appended table makes clear the differences between types of the usual commercial varieties of oil, comparison being shown with a sample distilled by myself from finest Dutch seeds. It may be noted that the specific gravities and boiling points of the two principal constituents of this oil which have been separated from this oil by repeated fractionation are:—

	B.P.	Sp. gr. at 15° C.
Carvene (limonene)	175° C.....	·8462
Carvol	224°-225° C.	·9641

undetermined) modify and enhance considerably the value of that oil as a flavouring agent.

It is, therefore, not considered desirable that the lead of the pharmacopœias already alluded to be followed by the inclusion of this oil in the new British Pharmacopœia, but the following may be noted as standards of purity and excellence of cassia oil.

Specific gravity at 15° C.—1·050—1·065.

Cinnamic aldehyde.—Should not yield more than 25 per cent. of non-aldehydes when treated with acid sulphite of sodium, equivalent to 75 per cent. of cinnamic aldehyde.

Chamomile Oil.—The oil of *Anthemis nobilis*. "distilled in Britain," is official in the British Pharmacopœia of 1885 solely for use in the prepara-

Fractionation.

Description of Oil.		Sp. gr. at 15° C.	Optical rota- tion in 10 Mm. tube.	Below 185° C.	185-200° C.	200-210° C.	220-230° C.	Above 230° C.
				Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
From Dutch seed	Own distillation	·9197	+83·5	9	31	20	39	1
ditto	German "	·9063	+79·0	30	26	18	22	4
From German seed	German "	·9006	+80·5	36	28	16	20	—
ditto	English "	·9102	+79·75	18	39·5	20	21·5	1
Caraway chaff oil	German "	·8482	-58·5	96	4	—	—	—

It is suggested, therefore, that the following characters and tests which are those of an oil of good quality be included in a new B.P.:—

Specific gravity not less than ·910 at 15° C. Not more than 15 per cent. of the oil should distil below 185° C., and at least 55 per cent. of the oil should distil above 200° C.

Cassia Oil.—The determined stand which has been made by Schimmel and Co. against the adulteration of this oil has done much to check the sophistication which had reached such alarming proportions. During the past three years I have had the opportunity of examining a large number of samples of this oil; in 1892 hardly any were free from adulteration, it being exceptional for the amount of cinnamic aldehyde to reach 70 per cent.

During the last year, however, out of forty samples analysed only two could be pronounced as undoubtedly adulterated, containing 46·6 and 47·3 per cent. respectively of cinnamic aldehyde, the average amount present in the forty samples being 76·2 per cent. A sample recently examined from a consignment which has been lying at a London Dock warehouse for fifteen years contained 91 per cent., and several samples have been found to contain 80 to 85 per cent.

It is not easy to state with accuracy that samples containing from 60 per cent. upwards are adulterated, but it is desirable to fix as high a standard of excellence as possible for this oil, as one can readily distinguish by the strength of odour samples containing 65 and 85 per cent. respectively of cinnamic aldehyde. The aldehyde-content of the oil is estimated by bisulphite of sodium, a most convenient application of which has been devised by Hirschsohn, depending on the solubility in hot water of the compound formed by the aldehyde with the bisulphite, and separation and measurement of the non-aldehyde constituents of the oil.

This oil is official in both the United States and German pharmacopœias, whilst that of cinnamon (*C. zeylanicum*) is not recognised. This inclusion is doubtless based on the greater average percentage of cinnamic aldehyde that the former contains as compared with the latter, but I am of opinion that such preference is not warranted, as the other bodies present in genuine cinnamon bark oil (some at present

tion of extract of chamomile, and for that and other purposes is so little employed as to warrant its exclusion from a future edition.

In chemical composition, however, it is one of the most interesting of the essential oils, and the examination of it by Demarcay in 1873 (*Pa. J.* [3], iv., p. 185), by which the presence of angelic esters of various alcohols were shown, has been partly confirmed and amplified by Köbig. The latter has separated by fractionation both angelic and tiglic acid esters of isobutyl, amyl, and hexyl alcohol. The occurrence of a paraffin in German chamomile oil, distilled from the flowers of *Matriaria chamomilla*, has been observed by Schimmel and Co., and is stated by them to be the reason of the solidification of that oil at low temperatures.

The samples I have examined, distilled in the Mitcham district, have had specific gravities of ·905 to ·912 at 15° C., and in the majority of cases possessed a bluish or bluish-green colour. The rotations of these oils vary between +1 and +3, a typical sample, selected for fractionation having a rotation of +2·25, and showing no sign of solidifying at 0° C. Its specific gravity was ·9064 at 15° C.

It yielded the following percentages on fractionation, the intensity of the blue coloration becoming more marked in the higher fractions:—

Below 170° C.	.....	5 per cent.
170-190	.....	27·0 "
190-202	.....	43·0 "
202-210	.....	15·0 "
210-215	.....	7·0 "
Residue	.....	7·5 "

The characters of the pure oil appear to be, therefore:—

Specific gravity.—·905 to ·912 at 15° C.

Optical rotation.—+1 to +3.

Cinnamon Oils.—It will be convenient to consider under this heading the oils of both the bark and leaf of *Cinnamomum zeylanicum*, the former only of which is official, the latter being, however, largely used for soap-perfuming and other commercial purposes. It is unfortunately, moreover, considerably used as an adulterant of the bark oil, and the results recorded below point to a most unsatisfactory condition of most of the bark oil of commerce as imported from Ceylon.

A careful comparison has been made of seven samples of oil, one of which (No. 1) I distilled especially from fine bold cinnamon, whilst Nos. 2 and 4 were distilled by English and German firms of repute.

The specific gravities of these three oils are practically the same, being 1.024, 1.026, and 1.025 at 15° C. respectively, and may be regarded as samples of fine quality, whilst Nos. 5, 6, and 7 imported from Ceylon have a specific gravity of from 1.0379 to 1.0421 at 15° C.

The specific gravities of the cinnamon "leaf" oils examined vary between 1.045 and 1.060, two samples included in a table for comparison with the "bark" oils being 1.054 and 1.055 at 15° C.

The addition therefore, of the leaf oil materially raises the specific gravity, and this character alone in Nos. 5, 6, and 7 points to a considerable admixture of this oil.

This is confirmed by their constitution, for whilst the principal constituent of true "bark" oil is cinnamic aldehyde, that of the "leaf" oil is eugenol.

The bark oils having a specific gravity of 1.024 to 1.026, contained from 60 to 70 per cent. of cinnamic aldehyde when estimated by Hirschsohn's method for the estimation of that body in cassia oil (which has already been referred to), whilst it falls in those of higher specific gravity as low as 26 per cent., and in the "leaf" oil is practically nil.

The percentage of eugenol in the pure "bark" oils, Nos. 1, 2, and 4, under notice varies from 4 to 7.1, the alcoholic solution of the oils becoming distinctly green with ferric chloride. The leaf oils examined contain from 80 to 90 per cent. of eugenol, the two samples under notice yielding 85 and 83.5 respectively, whilst Nos. 5, 6, and 7 contain from 32 to 36 per cent., and give well-marked reaction for eugenol with ferric chloride.

The optical rotation of the pure oils is practically nil, but as the leaf oils examined are dextro-rotatory, the fact that Nos. 5, 6, and 7 are slightly dextro-rotatory tends to confirm all the other considerations which point to the admixture with leaf oil to the extent of at least 30 per cent.

The above results are indicated in the following table.

From the above the following characters and tests seem those suitable for a new British Pharmacopœia.

Specific gravity.—At 15° C. 1.024–1.030

Optically inactive

One drop of the oil in 5 drops of rectified spirit should not give more than a pale green coloration with

ferric chloride. The oil should not solidify with a solution of caustic potash.

When treated with solution of bisulphite of soda solution (as described under cassia oil), it should not yield more than 45 per cent. of non-aldehydes, equal to 55 per cent. of cinnamic aldehyde.

Citronella Oil.—Although not official in any of the pharmacopœias, this oil is one which the druggist handles for various purposes in large quantities, and in consequence it seems desirable to call attention to the chief characteristics of it.

In a paper by the author (*Ph. J.* [3], xxi, 922), attention was called to the fact that the normal colour of the oil was yellow, and the green coloration becoming usually more intense on warming or exposure to sunlight, was due to the presence of traces of copper. Of the eight samples examined and there reported on, only one was found to be adulterated. During the last few years, however, the price of the oil has fallen considerably, and the sophistication has increased to such an extent that it is only with difficulty that a genuine oil is obtained. The oil should be soluble in alcohol of 80 per cent. strength, and this, together with the specific gravity, affords indications of the purity or otherwise of the oil, without rendering fractionation necessary. A pure oil should dissolve in ten times its volume of spirit of that strength, and the specific gravity should not fall below .887 at 15° C.

Schimmel and Co. stated (*Ph. J.* [3], xx., 264) that the gravity should not fall below .895 at 15° C., which is that of a sample distilled by themselves from dried grass, but no sophistication was detected in two of the samples examined and reported on in the above-mentioned note, which had a specific gravity of .887 and .890 respectively at that temperature. Recently (October, 1894), however, this firm announce that they have examined two samples of the oil having a specific gravity of .887 and .891 respectively, which were of good quality and unadulterated, thus confirming my observation previously recorded. The pure oil should therefore possess a specific gravity of not less than .887, and be soluble in ten parts of alcohol of 80 per cent. strength.

Clove Oil.—The specific gravity of this oil is variously stated by different authorities, the range of figures being from 1.041 to 1.067. The figures adopted by the United States Pharmacopœia are from 1.060 to 1.067, and the German Pharmacopœia 1.06.

Cinnamon Oils.

Description.	Sp gr. at 15° C.	Rotation in a tube of 100 Mm.	Per cent. of cinnamic aldehyde.	Per cent. of eugenol.	Probable condition of purity.	Reaction in alcoholic solution with ferric chloride.
1. Own distillation; from fine bark	1.024	Nil.	62.0	4.2	Pure.	Pale green.
2. English; from bark ...	1.026	Nil.	60.2	7.1	Pure.	" "
3. German; " ...	1.029	Nil.	38.0	31.0	Impure.	" Blue.
4. German; " ...	1.025	Nil.	70.0	4.0	Pure.	Pale green.
5. Imported from Ceylon (1).....	1.0409	+0.75	26.0	34.6	Contains at least 30 p.c. of "leaf" oil. Contains at least 30 p.c. of "leaf" oil. Contains at least 30 p.c. of "leaf" oil.	Dark blue.
6. Imported from Ceylon (2).....	1.0379	+0.50	29.2	32.2		" "
7. Imported from Ceylon (3).....	1.0421	+1.0	30.1	36.14		" "
8. Leaf oil (1).....	1.055	+1.25	Nil.	85.0		" "
9. " " (2).....	1.054	+1.0	Nil.	83.5		" "

The reason of this wide difference in recorded observations is due to the varying proportions of eugenol and the sesquiterpene caryophyllene.

Samples of oil distilled in Seychelles from fruit and stems in different conditions were examined, with the following result:—

	Sp. gr. 15° C.
Oil from green cloves	1.0648
" ripe "	1.0629
" dried "	1.0569
" green stems	1.0602
" dried "	1.0593

Many samples of English distillation from dried cloves are found of lower specific gravity than those above recorded, the lowest examined being 1.0518, the highest being a re-distilled sample which had a specific gravity of 1.064.

It may be noted that the specific gravity of pure eugenol is stated by various workers to be from 1.068 to 1.070 at 15° C., whilst that of the sesquiterpene caryophyllene is assigned specific gravities between .904 and .910 at 14 and 15° C., I find that pure eugenol has a specific gravity of 1.069 at 15° C., but the sesquiterpene I have separated has a specific gravity of only .9031 at 15° C.

The process suggested by Thoms for the estimation of eugenol (see abstract *Ph. J.* [3], xxii., 451), which consists in the formation of benzoyl-eugenol by means of benzoyl chloride, yields lower results than the specific gravities calculated from the amount of eugenol found would indicate and lead the author of that process to suggest that besides eugenol and the sesquiterpene, oil of cloves may contain a third body which may explain the varying relation between specific gravity and contents of eugenol. Thoms' process is open to objection both on account of the correction needed, viz., 7 to 8 per cent. for the solubility of benzoyl-eugenol in alcohol, as well as its volatility in the presence of traces of alcohol, although results concordant with one another may be obtained by the process.

A simple means which I have adopted for the estimation of eugenol consists in treating in a flask with long graduated neck, such as that suggested for cassia oil estimation, a definite quantity of the oil with 10 per cent. aqueous solution of caustic potash, warming the mixture, allowing the uncombined portion to rise, and measuring this portion at a temperature of 15° C, the difference being taken as the approximate percentage of eugenol. Three samples estimated in this way show the following result:—

	Sp. gr. at 15° C.	Found by Thoms' Process.	Found by Alkali Process.	Gravity.*
Re-distilled oil...	1.064	84.97 p.c.	96 p.c.	1.0634
From dried cloves	1.0518	77.8 p.c.	89 p.c.	1.0516
From stems	1.4051	76.32 p.c.	88.5 p.c.	1.0507

The percentages obtained by the process require slight correction for the difference in specific gravity of the two constituents, but correspond closely with the calculated proportions of constituents, and make it improbable that a third body (other than traces of vanillin) exists in the oil.

It is not suggested that this method would be applicable to other eugenol-containing oils, in which esters and bodies other than terpenes or sesquiterpenes are present.

The optical rotation of the oils examined vary between -0.25 and -0.75 in a tube of 100 Mm.,

* Calculated from relative proportion of eugenol (specific gravity at 15° = 1.07), and sesquiterpene (specific gravity at 15° = .908).

whilst all the oils examined distil within a very narrow limit above 247° C.

I have only examined one adulterated sample of clove oil, this one possessing a specific gravity of .9855 at 15° C., and containing a considerable proportion boiling below 85° C., consisting principally of alcohol.

The following appear to be the characters of pure clove oil, and are suggested for inclusion in a new British Pharmacopœia:—

Specific gravity.—Not below 1.050 at 15° C.

Optical rotation.—Not more than -1.0 in 100 Mm. tube.

When treated by the process described above, viz., saponification, with 10 per cent. potash solution, not more than 15 per cent. should remain uncombined, equal to 85 per cent. of eugenol.

No portion of the oil should distil below 247° C.

Copaiba Oil.—A comparison of the essential oils distilled from the two principal commercial varieties of copaiba has already been published by the author in a paper on "So-called African Copaiba" (*Ph. J.*, September 9, 1893). The oils of the South American varieties show but slight differences, the specific gravities and solubilities in various solvents being practically identical, whilst the laevo-rotatory power and range of boiling point show but slight variation. The oil from the African oleo-resin, the botanical source of which, though possibly an African species of *Copaifera*, has not been definitely determined, is dextro-rotatory, of higher specific gravity, and much less soluble in absolute alcohol.

The following abridged table of results clearly indicates these differences, it being hardly necessary to point out that the oil usually met with in commerce is derived from Para oleo-resin, in consequence of the larger proportion of essential oil contained therein.

	Maracibo. 42 p.c.	Para. (1) 80.2 p.c. (2) 64.3 "	African. 39 p.c.
Percentage of oil			
Specific gravity	.9052 "	.9060 "	.9180 "
Rotatory power	-34° 18'	-28° 55'	+20° 42'
Solubility in absolute alcohol	1 in 1	1 in 1	not soluble 1 in 50

The experiments of E. Hurry Fenwick, F.R.C.S., with the African oil, although proving it to be of a similar action to the oils of the South American varieties, do not warrant the recommendation of its inclusion in the new B.P., more especially as its botanical source is not determined and its import up to the present irregular.

The new British Pharmacopœia might require that the oil should be laevo-rotatory, have a specific gravity of .900 to .910 at 15° C., and be soluble in its own volume of absolute alcohol.

Cubeb Oil.—This oil, which is official in the United States as well as the British pharmacopœias, is not largely used, but is nevertheless of chemical interest. The oil is now so cheap as to render sophistication unlikely, but cubebes are subject to great market fluctuations, the prices recently being almost the lowest during the present generation.

The oils examined of English distillation have a bluish-green coloration which is due to the presence of a blue oil possibly similar to that contained in chamomile and Japanese valerian oils, which is more marked in the highest fractions on distillation.

The specific gravity of the oils examined vary between .910 and .925 at 15° C., a typical English sample, freshly distilled, possessed the following characters:—

Specific gravity.—.9222 at 15° C.

Rotation.—- 3.30 in a tube of 100 Mm.

Fractionation...175-250°	9.2 per cent.
250-260	26.8 "
260-270	47.6 "
270-280	7.2 "
Above 280	9.2 "

The composition of the higher fractions 260°-280° C. of the oil is interesting, as the presence of two sesquiterpenes are indicated, the hydrate of one of which is the so-called cubeb camphor.

The solubility of the oils in alcohol of 90 per cent. strength varies considerably, the sample under notice not being readily soluble even in twice its volume, several examined, however, answer the U.S. Pharmacopœia requirements that they shall dissolve in an equal volume of that solvent. The test appears, however, somewhat stringent, and an oil that answers the following may be considered as of good quality:—

Specific gravity.—910-980 at 15° C.

At least 70 per cent. of the oil distills between 250° C. and 280° C.

(To be continued.)

Reviews and Notices of Books.

PRESCRIBING AND TREATMENT IN THE DISEASES OF INFANTS AND CHILDREN. By PHILIP E. MUSKETT. Third Edition. Pp. 334. (J. Pentland Young, Edinburgh and London).

When a book reaches a third edition it is clear that it meets a certain want, and, as a rule, is of intrinsic value. The fact which is most striking in this book is the neatness and conciseness with which the work is compiled. The subject matter is arranged in alphabetical order, and includes many things which come under the domain of the surgeon as well as the physician. Indeed, this work might be termed a miniature or pocket Dictionary of Children's Diseases. Among some excellent quotations on the fly-leaf there is Sir William Jenner's wise advice: "When you see a sick child, don't always think of grey powders," and the student who masters the therapeutical advice in this little book will not be at a loss for medicinal agents appropriate for infants at any age, and in any clime. It may be sincerely recommended to all recently qualified men just starting in practice.

AN ELEMENTARY TEXT-BOOK OF ANATOMY. By HENRY EDWARD CLARK, F.F.P.S. Glasgow, M.R.C.S., Professor of Surgery in St. Mungo's College, Glasgow. Pp. 283, with numerous illustrations. Price 5s. (Blackie and Son, Old Bailey, London.)

This is an excellent elementary text-book, and considering its size, contains a wonderful amount of information on the subject upon which it treats. This is what might be expected from the pen of an acknowledged authority like Professor Clark. Perhaps there is scarcely any other subject upon which it is so difficult to write an elementary treatise as human anatomy, so that it shall provide sufficient information without including many things which can only be needed by the advanced student and those who can spare the necessary time to master so deep and important a study. The author fully carries out his object of providing a book for junior students and those training for the practical work of nursing the

sick, or for any one wishing to obtain a thoroughly sound elementary knowledge of anatomy. The matter is carefully arranged under the several heading of histology, osteology, arthrology, myology, angiology, micrology, and splanchnology, each section being lucidly written and amply illustrated, whilst a comprehensive glossary at the end of the book explains the meaning of all the technical terms used throughout the work. The illustrations are not only numerous, but quite equal to those in many larger works. There is a well-arranged index, and the book, which is printed in clear type and on good paper, reflects great credit on both author and publishers.

Correspondence.

THE ATOMIC THEORY.

Sir,—In your last week's issue your correspondent, Mr. Alexander Laing, petitions your aid in the "sitting upon," "mama-re," and "disipation" of the atomic theory when used as fact. So bold a request manifestly argues not only sufficient grounds for the rejection of so fundamental a theory, but that the petitioner possesses an intimate knowledge of the subject. Now the rejection of the theory that elementary matter consists of ultimate indivisible particles called atoms implies that matter, like time, space, and number, is infinitely divisible, and that such infinite divisibility is possible is universally agreed by philosophers—the "knowledge" of the infinite applying to the Deity alone. But what is possible and what exists is a very different affair, and the facts which support the atomic theory are as follows:—"If a substance A unites with another B in several proportions, then the masses of B which unite with one and the same mass of A always stand in simple ratios to each other," and this is no less than Dalton's law. Before the proposed *mama-re* commences, Mr. Laing will perhaps kindly tell us what he knows about infinity as applied to matter.

University College Hospital. WILLIAM ELBORNE.

Sir,—The application to atoms and molecules of the principle of gravitation which obtains amongst stars and systems is an applied fact. Atoms and stars are all immersed in the infinite ocean of ether, the waves of which, lashing them together, is the principle of gravitation, whose various phases depend upon how bodies more or less shield each other from the general surge. Witness air bubbles floating on the surface of water in a basin. If they remain far apart they may remain apart long enough, but bring them near to about an eighth of an inch from each other and then suddenly they gravitate together or combine. Why? Because the sides that are facing each other are shielded from the general pressure forces which are beating all round on the outer exposed sides, and so the air bubbles are forced together. There is a class of people still extant who in the face of applied science declare that the earth is not a globe, but a flat plain. Such a class of people are branded as "the flats." Let us beware then how we treat the above atomic gravitation law, lest in rejecting it we also be branded "flats."

Glasgow.

J. J. Brown.

. The fact of the publication of the above letters must not be taken to imply that it is considered desirable to discuss the truth or otherwise of the atomic theory or the principle of gravitation in our columns. They are both too generally accepted nowadays to be affected by anything that may appear in a journal of pharmacy, wise and learned though its correspondents may be.—[Ed. Pharm. Journ.]

Notes and News.

EVENING MEETING IN EDINBURGH.—The list of communications to the meeting of the Pharmaceutical Society at York Place, Edinburgh, on Friday evening, has been somewhat amplified since the announcement last week, the first place on the list being taken by Mr. James Mackenzie, F.S.A. (Scot.), who contributes an interesting old parchment containing the articles of association of the Society of Druggist Apothecaries in Edinburgh. This society was formed in 1785, and, though there seems to be no record of it in history, the document appears to be undoubtedly genuine. Another addition to the list is a paper on the "Legalisation of Metric Weights and Measures," by George Lunan.

PHARMACEUTICAL CONFERENCE AT LIVERPOOL.—According to the *Liverpool Mercury* it is proposed to invite the British Pharmaceutical Conference to meet in Liverpool next year, when the British Association also meets in that city, and at the meeting of the Liverpool Chemists' Association on Thursday, a resolution would be proposed to carry the idea into effect and to appoint a committee to make the necessary arrangements.

PHARMACEUTICAL EXAMINATIONS IN JAPAN.—At the two examinations for pharmacutists held in Tōkyō and Osaka, Japan, during 1891—particulars of which appear in the Annual Report, quite recently published, of the Central Sanitary Bureau attached to the Home Department of the Imperial Japanese Government—33 out of 166 candidates passed on the first occasion, and 36 out of 193 on the second. To prevent personation at the examinations each candidate is expected to write his own application for examination, and to let his photograph, taken during the same or previous year, accompany the written application. The number of pharmacutists licensed during the year was 23, of whom 14 passed the examination, whilst 9 were graduates of the Imperial University. Altogether there were 2692 pharmacutists, 11,849 druggists, and 1336 manufacturers of medicine in Japan, at the end of 1891.

ADULTERATION OF DRUGS IN ILLINOIS.—A Bill recently introduced into the Senate of Illinois is entitled, "An Act to prevent and punish the Adulteration of Drugs, Food, Drinks, or Confectionery." It proposes that the term "drug" shall include "all medicines for internal and external use, antiseptics, disinfectants, and cosmetics," and that the U.S. Pharmacopœia shall be the standard for all articles named in it, whilst the standard for others shall be any pharmacopœia or standard work on *materia medica* wherein the drugs are named. The Bill is likely to be opposed by Illinois pharmacists.

REPORT OF THE OPIUM COMMISSION.—The *Times* thinks the delay in the publication of this report (see p. 957), is not altogether to be regretted, since it has allowed time for the publication of the results of the inquiry into the use of hemp drugs (*ante*, p. 929). The result of the two inquiries proves beyond doubt

that neither opium nor ganja operates as a cause of disease, insanity, or crime among the Indian population

ANIMALS IN STERILISED AIR.—By keeping animals in a specially devised apparatus designed to supply them with air in an absolutely sterilised condition, and also feeding them with food as far as possible free from bacteria, Dr. J. Kijanczin, of the University of Kieff, has been able to ascertain that there was a remarkable decrease in their assimilation of nitrogenous matter. The reason suggested is that micro-organisms, when present, aid in the decomposition and peptonising of the nitrogenous matter in the intestine, and it is thought that were the removal of all the micro-organisms from the intestine possible, the decrease in the assimilation of nitrogen would be still greater. The animals also lost weight more quickly than under normal conditions, and excreted more nitrogen and carbon dioxide. In a number of cases the animals died a few minutes, hours, or days after the beginning of the experiment, and as yet it has not been possible to assign any cause for this result.

SIR JOSEPH LISTER AND THE ALBERT MEDAL.—The Albert medal of the Society of Arts was presented to Sir Joseph Lister, Bart., F.R.S., on Tuesday, April 9, by the Prince of Wales. It has been awarded to him for the discovery and establishment of the antiseptic method of treating wounds and injuries. Sir Joseph is the President-elect of the British Association for the meeting at Liverpool in 1896.

BRITISH MEDICAL ASSOCIATION ANNUAL MUSEUM.—In connection with the sixty-third meeting of the British Medical Association, which will be held in London, this museum will comprise the following sections:—A.—Drugs and foods, including chemical and pharmaceutical preparations, prepared foods, etc.; B.—Instruments, comprising medical and surgical instruments and appliances, electrical instruments, microscopes, etc.; C.—Books, including diagrams, charts, etc.; D.—Sanitary and ambulance appliances. The space allotted to the Annual Museum at the Examination Hall on the Victoria Embankment includes the whole of the first floor. The sectional meetings in medicine, surgery, psychology, pathology, bacteriology, laryngology, pharmacology, and therapeutics, will probably be held in other rooms in the building. A limited number of small rooms in King's College, where the following sectional meetings will probably be held:—obstetrics, anatomy and physiology, ophthalmology, diseases of children, otology, and ethics, are also available for separate exhibitors at special rates. The terrace at King's College has been placed at the disposal of the Committee for the exhibition of sanitary and ambulance appliances. All communications on general matters connected with the museum, and all applications for space, with a brief description of the exhibit, should be addressed to Dr. Oswald, 11, Chandos Street, Cavendish Square, before June 1. The Committee will allot the space as early as possible after that date.

LEICESTER BACTERIOLOGICAL INSTITUTE.—A laboratory for the training of medical men and others in bacteriological methods, and to provide for the examination of pathological and bacteriological specimens, has been fitted up for the Leicester authorities by Messrs. J. Richardson and Co., Limited, and placed under the direction of the Medical Officer of Health, Dr. J. A. Turner.

ANTI-STREPTOCOCCUS SERUM.—The truth respecting M. Marmorek's discovery, recently referred to (*ante*, p. 881), appears to be that he has prepared a serum which he claims to possess curative and prophylactic properties in connection with the numerous diseases associated with *Streptococcus pyogenes*. The cases experimented with were those of persons affected with puerperal fever and erysipelas, and extremely favourable results have been obtained so far.

DIPHTHERIA ANTITOXIN IN RUSSIA.—It is found in Russia that the extreme cold which prevails for so long a period causes Behring's antitoxic serum to lose part of its anti-diphtheritic properties, a quantity one and a half times greater than the maximum dose failing to neutralise a minimum fatal dose of diphtheria toxin. On the other hand, a serum prepared at the Moscow Bacteriological Institute suffered no ill-effects from exposure to cold, and in some experiments even appeared to have acquired stronger antitoxic properties.

CAMPHOR IN CALIFORNIA.—The New York correspondent of the *Lancet* states that an effort is being made to grow the camphor tree in California, with a view to replacing Formosa camphor by a native product.

GROCERS' COMPANY MEDICAL RESEARCH SCHOLARSHIPS.—These scholarships, three in number, are each of the value of £250, and open only to British subjects. They have been instituted by the Grocers' Company as an encouragement to the making of exact researches into the causes and prevention of important diseases, and the appointments are made annually, and the holders of the scholarships are entitled to preference in making future appointments. Applications for the current year should be made before the end of April to the clerk of the Grocers' Company, Grocers' Hall, Princess Street, E.C.

HELIUM FROM CLEVEITE.—As previously mentioned in the *Journal* (Epit. p. 111) Professor Ramsay has obtained from the mineral Cleveite argon mixed with helium. Professor Cleve, of Upsala, after whom the mineral is named, has since stated that specimens of it examined in his laboratory gave off a gas which did not contain any trace of argon. Examination of the spectrum revealed an exact coincidence of the line of the gas with the helium line, and an experiment to determine the specific gravity seemed to indicate that the gas is heavier than hydrogen. J. N. Lockyer announces in *Nature* that he has also failed to detect argon in the gases given off from Cleveite, on heating in vacuo, but he finds hydrogen associated with the new gas.

Proceedings under the Pharmacy Act.

SALE OF FELLOWS' SYRUP BY UNREGISTERED PERSONS.

At the Carnarvon County Court, on April 17, his Honour, Sir Horatio Lloyd, delivered judgment in an action heard at the last Court, in which the Pharmaceutical Society of Great Britain appeared as plaintiffs and Messrs. Evans and Lake, grocers, Carnarvon, as defendants (*ante*, Epitome, p. 115). The action was brought to recover £5, being the amount of penalty alleged to have been incurred by the defendants on January 2, 1895, by selling or keeping open a shop for the retailing, dispensing, or compounding of poison contained in "Fellows' Syrup of Hypophosphites," a preparation of strychnine, contrary to the provisions of the Pharmacy Act, 1868.—His Honour said that it appeared that Mr. T. J. Hughes, a registered chemist at Bethesda, having reason to suppose that unauthorised persons were selling this compound, went to the defendants' shop on January 2 and purchased a bottle of Fellows' syrup. Although Garner and Hughes, the assistants, denied having sold the compound, their evidence, to his mind, could not prevail against the positive testimony of Mr. Hughes, because, finding that the names of Messrs. Evans and Lake were not on the bottle he bought a pennyworth of sweets, which were packed in a bag with the firm's name, at the same time. At present he could not believe that Mr. Hughes was such a wicked person as to concoct the story. As a registered chemist of course he had an interest in the matter, but he had no reason to doubt that he was telling the truth. He had come to the conclusion that Hughes did buy the bottle there which contained strychnine. On the point of law raised as to "selling" and "keeping an open shop," his Honour also decided against the defendants. However, it was only right towards Messrs. Evans and Lake to say that he believed in their *bona fides*. Having seen Fellows' syrup in the list of goods not to be sold by unregistered persons, they no doubt did intend to withdraw the syrup from sale, but he was afraid that it was one of those good intentions which were not carried out. He gave judgment for the plaintiffs, with costs.—In reply to Mr. J. T. Roberts, his Honour said that he could not allow an appeal on the question of law, but would stay execution for a month, in order to give defendants an opportunity of deciding whether they would apply for a new trial or not.

SALE OF POISON BY AN UNQUALIFIED ASSISTANT.

At the County Court, Newcastle-on-Tyne, on Monday, April 22, before His Honour Judge Greenwell, the Pharmaceutical Society of Great Britain brought an action against Ernest Fleming, chemist's assistant, to recover £5, the penalty incurred by him for having on December 31, 1894, contrary to the provisions of the Pharmacy Act, 1868, sold a certain poison, namely, morphine, contained in the proprietary medicine known as Dr. Collis Browne's chlorodyne. Mr. T. R. Grey, barrister-at-law, London, appeared for the plaintiff Society, and Mr. Edward Clark, solicitor, Newcastle, defended.

Mr. Grey said the defendant was an assistant in the employ of Mr. Davidson, chemist and druggist, of 114, Westgate Road, Newcastle. Defendant was not a person qualified under the Pharmacy Act to sell poisons, and he, notwithstanding that, and not being under the supervision of his qualified employer, did sell on December 31 last, to a witness who would be called, a bottle of Dr. Collis Browne's chlorodyne. The chlorodyne had been analysed, and he would call the analyst to prove that it contained morphine, which was a poison under the Act, to the extent of 1 grain. The defendant by his action had rendered himself

Hable to a penalty of £5. Mr. Grey then referred his Honour to the judgments in the "Piper" and "Wheelodon" cases, which completely covered the ground of the present action.

Mr. Clark, in reply, said he must admit all the facts. His client was the unqualified apprentice of a chemist and druggist, he had no right to sell poisons, and he had sold this article. The bottle was, furthermore, labelled poison, and the defendant could only plead that he sold it under the impression that it was a patent medicine. He (Mr. Clark), from a perusal of the judgment against Piper in the case quoted by Mr. Grey, was satisfied that the article was not a patent medicine. He was there in order that full publicity might be given to the facts, and he hoped the Press would fully report the case so that the public might be informed that a chemist's apprentice was not bound to sell them any article that might be in his employer's shop.

His Honour: He is absolutely prohibited from selling poisons.

Mr. Clark further stated that his client had received no instructions from his master not to sell poisons, and he also thought that it was the duty of the master, who could not be got at under this section, to look away these poisons from his unqualified assistants.

His Honour said he thought that the best chemists did give instructions to their apprentices not to sell poisons, except under their direct supervision.

Judgment was given for the plaintiffs for £5 and costs.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

SALE OF DEFICIENT LIQUOR IODI.—At the North London Police Court, on April 18, John Dwyer, chemist, of 128, Balls Pond Road, Islington, was summoned by the Vestry of Islington for selling liquor iodi showing a deficiency of 45.2 per cent. of iodine and a slight deficiency in potassium iodide.—Mr. Yelverton, for the defence, submitted that the last clause of the indictment was too indefinite to be dealt with, and the prosecution consented to its being withdrawn. It appeared in evidence that Dr. Harris, Medical Officer of Health for Islington, sent an inspector to purchase 6 ozs. of liquor iodi, for which he paid the defendant 2s., and on analysis this proved to be deficient in strength. The defence was that sufficient time was not given for the iodine to be dissolved. The inspector was served within ten minutes, whilst it would take hours for the crystals to be dissolved. Defendant told the inspector so, notwithstanding which the inspector divided the 6 ozs. into three portions, and took one portion for analysis.—Dr. Harris was called, and said that if sufficient distilled water to simply cover the iodine, and iodide of potassium were added they would dissolve in a quarter of an hour.—Defendant's case was that having added the bulk of the water to facilitate the dispensing of the prescription, the iodine was so much longer in dissolving. He made up the prescription according to the Pharmacopoeia, and after the inspector had taken his sample from the 6 oz. bottle for analysis there still remained some of the undissolved crystals in the bottle. The 6 oz. bottle was taken away, and had been knocking about the Vestry Hall for some weeks unsealed, and consequently, owing to the volatile nature of the drug, the crystals had disappeared, and there was not much use in submitting it to analysis.—Mr. Lane suggested that the

third portion of the sample and what was left in the 6 oz. bottle should be sent to Somerset House, but Mr. Yelverton, on behalf of the defendant, said that considering the expense of further analysis, he would consent to a fine of 1s. and 5 guineas costs.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.—The annual supper took place in the Imperial Hotel, Market Street, on Friday, April 19, when about fifty were present. Mr. Alexander Sutherland, President, occupied the chair, and was supported by Mr. J. Laidlaw Ewing, Chairman of the North British Branch Executive, and Mr. Peter Boa, Chairman of the Edinburgh District Chemists' Trade Association; Messrs. J. M. Cameron and J. McBain acted as croupiers. Apologies were intimated from Messrs. D. Storrar, Kirkcaldy; T. Maben, Hawick; J. Lothian and D. MacLaren. The loyal toasts having been duly honoured, Mr. W. B. Cowie proposed "The Pharmaceutical Society," which was acknowledged by Mr. J. Laidlaw Ewing. Mr. W. Duncan proposed "The Edinburgh District Chemists' Trade Association," which was acknowledged by Mr. P. Boa. In the absence of Mr. Storrar, Mr. J. Laidlaw Ewing proposed "The Edinburgh Chemists', Assistants', and Apprentices' Association," which was acknowledged by the Chairman. In the absence of Mr. D. MacLaren, Mr. Thwaites proposed "The Edinburgh Pharmacy Athletic Club," which was acknowledged by the Vice-President, Mr. W. B. Cowie. Mr. Dey proposed "The Ladies," which was acknowledged by Mr. Hill. An excellent musical programme was provided by Messrs. W. Duncan, J. P. Gibb, Thwaites, O. Brown, J. Orich-ton, Robertson, A. Murray, R. H. Tweedie, R. Batchart, J. Brown, and J. M. Cameron; Mr. James Crichton acting as accompanist.

CHILDREN POISONED BY AN EYE LOTION.—On Monday, April 15, some children were playing near the railway embankment, Hollinwood, when one of them found a small bottle containing a dark coloured mixture. Thinking it was "Spanish juice," she drank part of the contents, and then handed the bottle to four other children, who all drank of it. Some time after they were all seized with drowsiness, and complained of feeling ill. During the night and the following day the children were in great agony, but on the Wednesday morning they were slightly better, though by no means thoroughly recovered. It has since been ascertained that the bottle contained a strong poison, used as an eye lotion, and it is supposed that some careless passenger on the railway had thrown it out of the carriage window.

DEATH UNDER CHLOROFORM.—At an inquest held at Stockport on April 20 on the body of James Swindells, aged 15, of Gee Cross, Cheshire, it was stated that he had been removed to Stockport Infirmary after being kicked on the leg. It was found necessary to perform an operation to remove a dead bone, and he was chloroformed, but died whilst under the influence of the anæsthetic. The jury returned a verdict of misadventure, adding that the chloroform was properly administered.

POISONED BY BROTH.—An inquest was held at Lisadran, near Newry, on April 20, on the bodies of Samuel and James Moffit, who had died in great agony, apparently from the effects of poison. Mrs. Moffit stated that she made some broth on Sunday of beans and barley, and that what was left was eaten for dinner on Monday. After dinner the whole family became ill, and her two sons died. The medical evidence showed that the broth had fermented and caused choleraic diarrhoea, and the jury returned a verdict accordingly.

THE GERMAN ELECTRO-CHEMICAL SOCIETY.—According to the *Electrical Review*, this new society, the object of which is the development of electro-chemistry in its scientific, technical, and economic aspects, has started work under very favourable auspices, the extent and quality of the membership being highly encouraging. The first meeting was recently held at Berlin, when Professor W. Ostwald read a paper upon the researches of J. W. Ritter, a contemporary of Galvani and Volta, who was the first to perceive that Volta's electro-chemical arrangement of the metals corresponded to the order of their affinity for oxygen. An exceedingly interesting paper has also been communicated by Dr. O. Fröhlich on the practical applications of ozone. This gas has been introduced in Germany into many different branches of industry, the most important of which are, so far, bleaching, the maturing of spirits, tobacco and coffee, and the ageing of wood, especially in its application to the sounding boards of pianofortes. Amongst other branches of industry in which ozone is now being successfully employed are the thickening of linseed oil, which, in the linoleum factories is brought about by allowing it to trickle over strips of gauze for several months; the use of ozone, however, effects the purpose in a few days. Dr. Fröhlich dwelt, as might have been expected, with considerable detail upon a process for converting crude potato starch into the soluble variety (a very important operation to the distiller), as well as into dextrin and other gummy substances, by means of ozone. He hopes shortly to accomplish the production of nitric acid from the air by means of ozone. In this he is wished more abundant success than he is likely to realise. It has long been a favourite dream amongst chemists, and if it could be done an immense economy would probably be affected in the production of this most useful acid. The atmosphere contains all the constituents necessary for manufacturing nitric acid, viz., water, nitrogen, and oxygen, and without being very sanguine that Dr. Fröhlich will succeed, there is every *prima facie* reason why he should. If he does it will be another triumph for electricity. The new German society has begun uncommonly well; there is certainly room for it, and it may be wished a successful future.

EXPENSES UNDER THE FOOD AND DRUGS ACTS.—One of the anomalies of English justice is forcibly pointed out by Dr. Alfred E. Harris, medical officer of health for Islington, in a report on the inadequacy of the penalties imposed for selling margarine as butter, and the injustice of the system of apportioning the costs. He submits that the vestry should at least have its out-of-pocket expenses, or the encouragement to multiply the prosecutions fails. He is "strongly of opinion that pressure ought to be brought to bear upon the Home Secretary to order the fines to be paid into the funds of the sanitary authorities who administer the Food and Drugs Acts, not only in London but throughout the provinces. If this be done I feel certain that the sale of margarine as butter would be very speedily ended." The medical officer goes on to say, that "whilst in the majority of cases the magistrates allow 12s. 6d. costs, the vestry only gets 2s. 6d. of that sum; yet, as a fact, it invariably costs the sanitary authority the 12s. 6d., for the purchase and analysis of the sample, without including the costs of the court"; and he concludes: "It is bad enough to be deprived of the penalties, but it is most ridiculous that the vestry should be fined for putting the Act into force, but that is what the insufficiency of the costs means."—*Daily Telegraph*.

PRESCRIBING BY A CHEMIST.—On April 17 Dr. Wynn Westcott held an inquiry at Bethnal Green Vestry Hall concerning the death of Alfred Wigga, aged three years, the son of a painter, of Tent Street, Bethnal Green. Jane Wigga, the mother, deposed that the child had been ill for a week, and witness treated it for bronchitis. She procured threepennyworth of mixture at "Dr." Lacy's, in the Whitechapel Road, a chemist's shop, but the child became worse, and witness then procured a powder from another chemist and gave it to the child. At midnight it was seized with a fit, and witness went for a doctor, but he refused to attend without a fee of 5s. Death ensued on the Sunday morning about four o'clock. Dr. Quinlivan stated that death was due to pneumonia and pleurisy. The child must have been seriously ill for many days.

The coroner, addressing the mother, said that a chemist was taught to weigh up and sell medicine, but it was a great mistake to suppose he could give proper medicine for anyone merely on the symptoms being described to him. He was not supposed to know how to treat diseases, and the mother might just as well have asked her butcher to prescribe. A verdict of "Natural Death" was returned.

DRUG CONTRACTING FOR THE POOR.—A correspondent of the *Southampton Times* points out that one of the most prominent features of the "drug tender form" is that the British Pharmacopoeia (B.P.) is to be taken as the standard. Tests of purity, etc., are therein contained, and need only to be applied to find out impurities and adulterations. Yet, in the face of this, one finds throughout this model document the word (sometimes in English and sometimes in Latin) "pure," and in addition "B.P." He asks if a preparation is "B.P.," is it not "pure"? "Another prominent feature is that the bulk of the standard preparations are to be by special makers, thus preventing the contractor who manufactures from supplying, although he makes according to the standard (B.P.) laid down, and by which all chemists are bound by law to do, or render themselves liable to be prosecuted under the Food and Drugs Act. One item which strikes the eye is 'distilled water' (followed by the name of a local firm), thus compelling the contractor to buy an article in daily use by every chemist from one firm, even though they may make it themselves. Again, 'solution of arsenic,' which is made by nearly every chemist, is here ordered to be of a certain London make. 'Morphine hydrochloras, pure, B.P. standard strength.' What does it mean? B.P. indicates the purity, and also standard strength. What other standard is necessary? Next, 'oleum morrhue pale non-congealable elect. opt. nov.,' etc. (translated cod-liver oil pale uncoaguable, chosen, best, new). Further down, 'oleum jecoris aselli nov. B.P. special' (translated cod-liver oil, new British Pharmacopoeia special). In each case a so-called maker's name follows, and both different, exhibiting an ignorance which one would not expect from a twelvemonth's apprentice. Firstly, both articles are the same, under the new and old names. Secondly, I take it that neither of the makers named are makers at all. But chemists are asked to tender for the same article labelled differently, and in all probability the oil is from the same manufactory, and any buyer of quantity can purchase from the same source as these London men. Next, 'nepenthe, Ferris.' Now this is a registered name, and been in use for many years, and only made by 'Ferris,' so that this is useless and gratuitous information. Next, 'unguentum sinici oxidi benzoated, B.P.' If it is B.P. it must be benzoated. Again, oil of peppermint, 'Hotchkiss, H. G.' (a well-known American brand), is to be bought from a London distiller. What nonsense!

This article is placed on the open market. Another joke is 'plumbi acetas, Ang.' (English). Will this responsible person state what special part of England it is to come from? It is an insult to an educated body of men to ask them to contract on such terms. To insist on special makers' names appearing on ordinary drugs and preparations made by most chemists, and by every manufacturing chemist, is as bad as insisting on the hay being supplied from a special farm, and placed in sealed bags, branded with the name of the farmer, because the man whose duty it is to receive it on behalf of the Corporation cannot judge of its quality."

REPORT OF THE OPIUM COMMISSION.—A summary of the report of the Royal Commission on Opium was issued this week. The Commissioners, by a majority of eight against one, report in favour of the continuation of opium cultivation under present conditions, and come to the conclusion that "it has not been shown to be necessary or to be demanded by the people that the growth of the poppy and the manufacture and sale of opium in British India should be prohibited except for medical purposes." As to the moral and physical effect of the drug upon its consumers, its excessive use has many evil results, but, say the Commissioners, "in every part of India with which we had to deal, we found witness after witness testifying to the belief in opium as the common domestic medicine of the people. It is taken in cases of specific disorders, such as rheumatism, diabetes, chill, and diarrhoea. It is regularly administered to unweaned children. In malarial and damp tracts there is general faith in its virtue, either in warding off or in curing fever." They find a preponderance of evidence that the use of opium in India is moderate, and leaves no evil effects; and, they say, "excess is exceptional, and condemned by public opinion."

Native opinion is entirely opposed to prohibition, and the Europeans in India are on the whole strenuously opposed to it, while the Protected States could not be included in prohibition and would get the trade abandoned by the British provinces. Smoking is regarded as a disreputable use of the drug, and legislation against smoking saloons and clubs might not be viewed with disfavour. As to the existing treaties with China with regard to the importation of Indian opium into that country the Chinese Government has formally admitted that it is satisfied, so that the commissioners represent that there is no sort of obligation to take any steps in the matter on behalf of China.

Mr. Henry J. Wilson, M.P., the single dissident, gives instances which he regards as proving that the authorities took up a partisan attitude, and "seemed determined that no evidence should be submitted to the Commission which had not been subjected to official scrutiny in high quarters." He contends that "whatever the Government of India intended, by their determination not to seek for evidence of an anti-opium character, its action was likely to be understood, and was undoubtedly understood, to mean that pro-opium evidence was to be sought for, and anti-opium evidence was not." Apart from these complaints as to the partiality of the inquiry, Mr. Wilson thinks the growth of the poppy and the manufacture and sale of opium should be prohibited except for medicinal purposes, and that when the Chinese trade is ended, and licences for cultivation are refused, licences for transit from Native States, except for medical purposes, should be withheld, and that official vendors should be appointed, with instructions to restrict the sale. He recommends the entire prohibition of opium smoking, and adds, "The Report adopted by my colleagues appears to me to partake more of the character of an elaborate defence of the opium trade of the East India Com-

pany, and of the present Government of India, than of a judicial pronouncement on the immediate questions submitted to us."

THE SALE OF ARSENIC IN INDIA.—The last report of the Chemical Examiner in Burma is said to supply additional evidence in favour of the proposals made to the Indian Medical Congress by Surgeon-Captain Evans for restricting the sale of arsenic. Out of twenty-five cases of poisoning brought to notice last year fifteen were cases of arsenic poisoning.

THE DEATH OF MR. G. W. SARGENT.—Dr. Stevenson, the official analyst to the Home Office, having completed his report in connection with the sudden death of Mr. G. W. Sargent, chemist and druggist, of South Kensington, who was found lying unconscious behind his counter, and died at St. George's Hospital, it was presented at the adjourned inquest on April 20. It stated that the death of Mr. Sargent was due to poisoning by morphine, and the jury returned a verdict to the effect that death was due to morphine poisoning, but how it was administered there was no evidence to show.

ACCIDENT TO DR. STEVENSON.—On Saturday, April 20, Dr. Thomas Stevenson, the official analyst to the Home Office and Government Visitor at the Pharmaceutical Society's examinations, was thrown out of his cab in Buckingham Palace Road while proceeding to the Westminster Coroner's court to give evidence in connection with a case of death from poisoning by morphine. The accident was caused by the horse suddenly falling down, but happily the occupant of the cab received nothing worse than a severe shaking and one or two bruises, and was able to proceed to his destination without delay.

Poisoning Cases and Inquests.

Tincture of Opium.—Edward King, a publican, was found dead on Wednesday, April 17, on Wandsworth Common, having died from the effects of tincture of opium, self-administered. Verdict: "Suicide during insanity."

Carbolic Acid.—William Hebson, aged 45, died on Wednesday, April 17, at the Stanley Hospital, Liverpool, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst in a state of temporary insanity."

Strychnine.—Robert Rawsthorne, a publican, died on Thursday, April 18, at Bolton, from the effects of strychnine.

Oxalic Acid.—An inquest was held on Thursday, April 11, on the body of an unknown man, who was found dead on the road at Normanton on the previous Tuesday. Death was due to oxalic acid poisoning. Verdict: "Suicide whilst temporarily insane."

Sulphuric Acid.—Alice Reay, aged 22, died on Wednesday, April 17, at 44, Union Street, Walsall, from the effects of sulphuric acid, self-administered. Verdict: "Suicide during temporary insanity."

Prussic Acid.—G. A. Drew, aged 58, a veterinary surgeon, died on Wednesday, April 17, at Abingdon, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Laudanum.—Alexander Patterson, died on Sunday, April 21, at 33, Gate Street, Swinton, from the effects of laudanum. Verdict: "Death by misadventure."

Obituary.

Notice has been received of the death of the following:—

On April 16, George Cheestham, Chemist and Druggist, Timperley. (Aged 82.)

On April 20, R. H. Kearnes, Chemist and Druggist, Bilston. (Aged 63.) The deceased was at one time one of the most prominent tradesmen in Bilston, taking, as he did, a leading part in all public matters, and at the same time carrying on a very extensive wholesale and retail business as a chemist. For many years he was one of the directors of the Bilston Gas Company and a member of the Board of Guardians.

On April 21, William Darling, Pharmaceutical Chemist, Manchester. (Aged 82.) Mr. Darling was one of the Founders of the Pharmaceutical Society.

On April 21, Robert Owen Fitch, Chemist and Druggist, South Hackney. (Aged 65.) Mr. Fitch had been a member of the Pharmaceutical Society since 1869, and was the Society's divisional secretary for South Hackney.

Patent Office Business.

APPLICATIONS FOR PATENTS.*

No. 7128.—Improved apparatus to facilitate the labelling of bottles and other vessels. April 8, 1895.

No. 7167.—Improvements in apparatus for pumping, raising, or elevating liquids, semi-solid substances, grain, or the like. April 8, 1895.

No. 7181.—Improvements in tooth cleaning devices. April 8, 1895.

No. 7214.—An improved liquid-measuring and draught tap. April 9, 1895.

No. 7235.—Improvements in or connected with bottles and their closing means, with a view to preventing the refilling thereof. April 9, 1895.

No. 7262.—An antiseptic case for surgical instruments, combined with a sterilising apparatus. April 9, 1895.

No. 7267.—Improvements in separating fluids of different specific gravity and in apparatus therefor. April 9, 1895.

No. 7286.—Improvements in, and apparatus for sterilising liquids. April 9, 1895.

No. 7390.—Improvements in centrifugal machines for separating fluids of different densities. April 11, 1895.

No. 7488.—A new or improved medicinal appliance. April 12, 1895.

No. 7497.—A new appliance for gumming or moistening labels or other papers. April 13, 1895.

No. 7508.—New food preparations, liquid and solid, for animal food. April 13, 1895.

PATENTS PUBLISHED APRIL 20.

Extracting metals from ores (Thompson, W. P. Communicated from Bonehill, L. R., and Gautier, E. T.).—The invention relates to a method and furnace for obtaining copper, lead, gold, silver, and other metals direct from the ore by a single operation. The ore, mixed with fuel, is fed into a furnace having an inclined bed, through an opening in the roof, and is subjected to a blast of air from a number of tuyères at the side of the furnace. The metal thus reduced flows towards an outlet in the furnace, the portion on the upper part of the bed being covered with the slag, but that at the lower portion being entirely exposed to the blast to "refine it." Suitable condensing chambers are provided for obtaining volatile products from the ores. No. 8183 of 1894.

Aerated beverages (Schwartz, J.).—Relates to private or coin-freed or other vessels for supplying soda-water, etc., and comprises an arrangement in which water or other beverage supplied automatically or otherwise, is saturated with carbonic acid gas from one of the ordinary compressed-gas cylinders. The gas may be caused by baffles in the vessel to take a circuitous path in traversing the liquid, to ensure rapid saturation. The turning of the tap which draws off the aerated liquid may be arranged to

admit an equal supply of the unaerated liquid and a sufficiency of gas. No. 8484 of 1894.

Breast-pump (Lake, H. H., communicated from Golfieri, A.).—The apparatus is made mainly of indiarubber, and has a mouthpiece which is placed against the breast, while a suction apparatus consisting of an ordinary collapsible ball is operated to draw the milk from the nipple into a small reservoir. The mouthpiece contains a hollow ring connected with a collapsible ball, and so shaped as to embrace the nipple. While the milk is being withdrawn, the last-named ball is alternately compressed and allowed to expand so that the nipple is constantly pressed and released by the ring as by the lips of a child. No. 9747, A.D. 1894.

Softening water (Hooper, G. G., and Tyacke, F. H.).—Relates to the ordinary method in which lime-water is used. The apparatus is fitted with chambers in which clear lime-water is produced from cream of lime; mixing arrangements in which, by means of a screw or other appliance, the requisite amount of lime-water and of the water to be softened are mixed; settling tanks in which the carbonate of lime is deposited, and a filter. The whole apparatus is fitted in an outer casing. No. 9814 of 1894.

Treating gold and silver ores (Thomson, G.).—The ore, having been roasted if sulphurous, is heated to strong redness in a furnace, and subjected to the action of "hydrochloric acid or an alkaline chloride with sulphuric acid." The inventor states that the gold and silver are volatilised, probably as chlorides, and may be condensed in water or otherwise. He proposes to use at least two condensers, one containing water which retains the gold, and the other containing dilute nitric acid which retains the silver. No. 10,249 of 1894.

Saturating liquids with gases (Beins, J. F.).—Comprises an apparatus in which water or other liquid may be saturated with carbonic acid gas, air, oxygen, ammonia, or other gas without the use of agitators, etc. It consists of an upper and a lower compartment connected by a number of porous porcelain tubes which form the top of the lower compartment. The liquid to be treated is charged into the upper compartment, and the gas is supplied to both compartments, but at a higher pressure in the upper one. The liquid is thus forced through the porous tubes as spray and becomes saturated with the gas and may readily be drawn off from the lower compartment. Bottling arrangements are described by the inventor. No. 10,523 of 1894.

Trade Marks Applied For.*

No. 185,164.—CHEMICAL SUBSTANCES used for Agricultural, Horticultural, and Sanitary Purposes, and Horse and Cattle Medicines, and Dressings included in Class 2.—Thomas Pink, Staple Street, Long Lane, Borough, London, January 26, 1895. A Bird of Paradise and the words "Paradise-bird Brand."

No. 184,895.—INSTRUMENTS, APPARATUS, AND CONTRIVANCES, not medicated, for surgical or curative purposes, or in relation to the health of men or animals, not being goods coming under sub-section 3 of section 81 of the Patents, Designs, and Trade Marks Acts, 1883, but not including vaccine, human or animal, and pin points, and stoppings for teeth not of precious metals, and not including any goods of a like kind to any of these excluded goods.—Henry Daubeney Brandreth, 23, Hamilton Square, Birkenhead, December 19, 1894. Device: A hand touching a spot and the words "Homoea instantly touches the spot." The essential particulars are the word "Homoea" and the device.

No. 184,985.—INSTRUMENTS, APPARATUS, AND CONTRIVANCES, not medicated, for surgical or curative purposes, or in relation to the health of men or animals.—Southall Brothers and Barclay, 17, Bull Street, Birmingham. January 16, 1895. Device: Three links of a chain, with a motto (*Semper eadem*) and initials of applicants. The essential particular is the combination of devices.

No. 185,593.—OLIVE OIL.—Southall Brothers and Barclay, 17, Bull Street, Birmingham. February 14, 1895. Device: A shield with device of a female figure carrying a pitcher, and a motto (*Dulce qua purum*). The essential particular is the device.

* From the *Illustrated Official Journal (Patents)*.

* Compiled from the *Trade Marks Journal*.

New Remedies.

[The notes given under this heading for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

CALCIUM BROMIDE AS A SEDATIVE IN TYPHOID.—Dr. G. Sée proposes the use of bromide of calcium as a sedative, administering a dessertspoonful of a 10 per cent. solution diluted with twice its volume of water (*Revue de Therapeut.*, Jan. 1, 1895).

DRESSING FOR TEMPORARY TREATMENT OF SEVERE WOUNDS.—Branère recommends as a dressing for embalming crushed limbs or other severe wounds, so that surgical intervention may be safely postponed, an antiseptic gauze compress saturated with the following unctuous dressing:—Salol, resorcin, and antipyrine, of each 12 parts; boric acid, 20 parts; iodoform, 1 part; vaselin, 160 parts (*Revue de Therapeut.*, Jan. 1, 1895).

THYMUS GLAND SECRETION AS A HÆMOSTATIC.—Wright finds that the following preparation of thymus gland of the calf is powerfully hæmostatic. One calf's sweetbread is cut into small pieces, and macerated for twenty-four or thirty-six hours, with frequent shaking in the following menstruum:—Sodium carbonate, 3 to 6 parts; chloroform, 15 parts; distilled water, 300 parts; filter, and add chlorinated lime, 30 parts. Again filter, and add finally sufficient caustic soda to produce a faintly alkaline reaction. Preserve in well-stoppered bottles. Wounds are simply touched with the liquid (*Revue de Therapeut.*, after *Chem. Centr.*).

ANTIPYRINE AMYGDALATE IN WHOOPING COUGH.—This body, which has been named "tussol," is obtained as a crystalline compound by treating antipyrine with amygdalic acid. Dr. Rehn has used it in over sixty cases of whooping cough; the mean duration of the attack in cases treated by tussol is three weeks for those of ordinary severity. Under one year the daily dose is from 15 to 30 centigrammes in separate quantities of 5 or 10 centigrammes; from two to three years, from 40 centigrammes to 1 gramme; from three to five years, 1½ gramme daily. Older children may take from 3 to 6 grammes in a day in doses of ¼ gramme at a time. It may be given in the following form to young children:—Tussol, 2½ gm.; water, 80 gm.; syrup of orange, 20 gm. Each teaspoonful contains 10 centigrammes of tussol. It should not be given in milk nor soon after a repast composed of that food (*Münchener Med. Wochenschr.*).

GUAIACOL APPLIED EXTERNALLY IN PLEURISY.—Miron-Ligales applies the following in pleural effusions to the whole posterior portion of the thorax, two applications being made at an interval of twenty-hours. Guaiacol, 3 parts; glycerin, 20 parts; tincture of iodine (Codex), 20 parts (*Rev. de Therap.*, Jan. 1895).

PILOCARPINE HYDROCHLORATE IN PEURIGO.—Escherich injects twice daily from 1 milligramme to 2 centigrammes of the salt.

LOSOPHAN IN FAVUS.—After cutting off the hairs from the diseased parts and thorough washing with soft soap and water the following ointment is applied twice daily: losophan, 4 parts; cold cream, 8 parts; lanoline, 24 parts (*Med. Press.*)

STRONTIUM LACTATE IN ALBUMINURIA.—Ried confirms the value of strontium salts as diuretics in anasarca and also in mitral contraction, while in albuminuria the amount of albumin excreted is sensibly diminished. Since salts of strontium given in powder frequently cause nausea and vomiting, it is preferable to give the lactate in solution, thus:—Lactate of strontium, 25 parts; water, 150 parts. Three or four tablespoonfuls in the day. (*Wiener Med. Wochenschrift.*)

NITROGLYCERIN IN SCIATICA.—The following mixture is recommended in doses of 1 to 3 drops three times a day:—

Solution of nitroglycerin (1 per cent.)...	2 parts.
Tincture of capsicum	6 "
Peppermint water	12 "

(*Revue de Therap.*)

EXTRACT OF VIBURNUM IN PAINFUL DYSMENORRHEA.—In severe cases, absolute rest in bed should be ordered, with the following mixture:—Potass. bromide, 10 parts; antipyrin, 10 parts; liquid extract Viburnum prunifolium, 20 parts; brandy, 30 parts; syrup of orange, 30 parts; distilled water, 120 parts. From two to four tablespoonfuls to be taken daily (*Therap. Monats.*).

ASAFCETIDA IN ABORTION AND GYNÆCOLOGY.—Dr. Warman strongly advocates the use of asafetida during pregnancy to prevent abortion and to modify the difficulty of chronic constipation, which is often a serious factor to treat in such cases. He administers the asafetida in pills, each containing 10 centigrammes of the gum resin (about 1½ grain). Two pills are taken daily, gradually increased up to ten pills per diem, with a subsequent diminution of the dose until the birth takes place (*Therap. Monats.*, Jan., 1895).

CARBOLIC GLYCERIN INJECTIONS IN HÆMORRHOIDS.—Papp and others advocate the direct injection of 5 to 10 drops of equal parts of glycerin and phenol into the nodules by means of a Pravatz syringe. The needle should be allowed to remain in the puncture for a few minutes after injection. Before practising the injection the rectum should be cleared and disinfected. In the second week after the injection the nodules will soften, and entirely disappear in a few weeks (*Therap. Monats.*, Feb., 1895, after *Pester Med. Chirur. Presse.*).

LYSOL IN INFECTIOUS FEVERS.—Tison gives a tablespoonful every two hours of the following mixture in cases of infectious fevers:—Lysol, 6 to 12 minims; oil of peppermint, 1 to 2 minims; simple syrup, 30 grammes; infusion of lime-tree flowers, 90 grammes (*Revue de Therapeut.*).

POTASSIUM CANTHARIDINATE IN PHTHISIS.—The following is the preparation for the solution of potassium cantharidinate employed in the treatment of phthisis first suggested by Liebreich and employed by Petteruti. Twenty centigrammes of purest cantharidin, and 40 centigrammes of dry potash, free from carbonic acid are added to 20 C.c. of water heated in a water bath until dissolved; the solution, kept heated, is then gradually diluted to 1000 C.c.; it is then cooled to 15° C., and the necessary amount of sterilized water added to make it up to 1 litre. Each gramme of this solution contains 0.0002 gm. of pure cantharidin. The treatment commences with an injection of half a Pravatz syringe, i.e., half a cubic centimetre or 0.0001 Gm. of cantharidin (*Therap. Monats.*, Feb., 1895).

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient general interest.]

ECZEMA CAUSED BY A HAIR-DYE.

[840]. Dr. Du Castel reports a case of eczema of the scalp following the use of a hair-dye. This was composed of two liquids—one (colourless) was simply peroxide of hydrogen; the other (dark-coloured) contained a large quantity of potash and of pyrogallol. These irritant substances, in the doctor's opinion, perfectly account for the morbid state of the skin (*L'Union Pharm.*, April, 1895).

PREPARATION OF SANTONIN BISCUITS.

[841]. M. G. Apostolides recommends the following rapid method for extemporaneously preparing santonin biscuits. Dissolve 1 gramme of santonin in a mixture of 2 grammes of chloroform, and 1 gramme of alcohol. Take twenty biscuits and drop upon each 10 drops of the solution and allow to dry. Each biscuit will contain 0.05 gramme (nearly 1 grain) of santonin (*Journ. de Pharm. and Chim.*, April 15, 1895).

PIXOL.

[842]. This is pine-wood tar treated with soft soap and caustic potash. Dounalsky finds an aqueous solution containing 10 to 13 per cent., applied three or four times daily, excellent in dermatitis from various causes, in psoriasis, soft chancres, and other venereal sores (*Annal. Dermat.*).

MEDICATED CRAYONS FOR SKIN DISEASES.

[843]. M. J. Monties modifies Unna's formula for the basis of these articles thus—Cocoa butter, 75 parts; hard paraffin, 5 parts; olive oil, 10 parts; active ingredient as directed. Melt the paraffin with a part of the cocoa butter, add the rest, and melt with a gentle heat. Triturate the active ingredient in a warm mortar with the oil, then pour in the melted fats, and mix. Cool the mass in glass tubes, oiled on the inner surface, and open at both ends; one end is closed with a cork to serve as a mould. These pencils are firm, but melt at the temperature of the body; they keep well, and are convenient to handle. The melted portion does not extend beyond the part touched (*Journal des Mal. Cutan.*, Feb., 1895).

LAVENDER OIL FOR STERILISING SURGICAL CATGUT.

[844]. Dr. Schüller recommends the use of pure lavender oil as a sterilising agent for surgical catgut: the strings are digested in a steriliser at a temperature from 106 to 110° C. for half an hour, in wide glass tubes filled with the oil and fitted with glass stoppers. Lavender oil has the advantage over other fluids that it does not weaken the catgut, which retains its resistant properties after several sterilisations. The thorough sterilisation of catgut by means of lavender oil has been proved both by bacteriological tests and by practical experience (*Therap. Monats.*, Feb., 1895, after Arztl. Pract.).

ASAPROL AS A REAGENT FOR ALBUMIN, ETC.

[845]. Dr. Riegler states that a 10 per cent. aqueous solution of asapol is a good reagent for albumin, albumose, pepsin, and peptone. About 4 C.c. of the liquid to be tested is rendered acid with 2 drops of concentrated sulphuric acid, then treated with 10 drops of the asapol solution; in the presence of any of the albumin, etc., a precipitate occurs. The precipitate due to albumin, however, is permanent on heating, while that from albumose or peptones dissolves on warming and reappears on cooling. If albumin and peptones are present in the same liquid the albumin may be removed by filtering the hot solution, when the peptones or albumoses may be detected in the cold filtrate (*Therap. Monats.*, Feb., 1895, after *Wiener Klin. Wochenschrift*).

Notices, Letters, and Answers to Correspondents.

* * Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines—and, preferably, twice the required size—must be supplied not later than a week before the proposed date of publication.

MINIMUM CUTTING PRICES.—Messrs. Blondeau and Co., of Ryland Road, N.W., write as follows:—Our attention has been called specially to the letter of Mr. Charles B. Allen in your issue of the 30th ult. on minimum "cutting" prices, and we think it is due to ourselves that we should explain that we are of the opinion that the full retail prices of proprietary articles are those which should be advertised to the public by the manufacturers. Though we advertise a large number of preparations, and our advertisements appear in some thousands of papers, we have had hardly any complaints of the prices being wrong. Our instructions to our advertising department are to advertise the full retail prices. If the retailers will kindly take into consideration the good profits on "Vinolia" soap and preparations that we have secured to them during the last few years, we opine they will not find very much fault with our policy, indeed, the fact that so slight a slip in the case of only one of our cheapest preparations causes so severe a comment is to our mind one of the strongest evidences that could be adduced to prove the success of our fair-profit system. The corner-stone of our policy has been a fair profit to the retailer, and this we are sure has been very much appreciated.

CORRECTIONS.

Plymouth.—Mr. James Cocks writes to say that in the report of the quarterly meeting of the Plymouth, Devonport, Stonehouse, and District Chemists' Association contained in the Journal for April 20, Mr. J. D. Turney is represented as having said the public should be more "considered" on Sundays, instead of which, it should have been "considerate." Reference to the written copy shows that the compositor was quite justified in interpreting the word as it appeared.

Glasgow.—Mr. Alex. Laing draws attention to several errors in the report of the Glasgow Association on the Revision of the British Pharmacopoeia, as published in last week's Journal. It is particularly to be regretted that official reports from associations are not written with sufficient clearness and accuracy to prevent the frequent recurrence of such unfortunate mistakes. In the following instances the error exists in the manuscript supplied to us:—Page 923, under "proposed omissions" for "acid. lacticum" read "acid. lacticum dilutum"; p. 924, in the formula for *mistura guaiaci* read "cinnamon water to make 3ij," and in the formula for *jodide of potassium ointment* read "glycerin, 60 minims." Two compositors' errors also occur in the first column on page 924, where the dose of acid. lacticum should have been stated as "up to 20 minims," and the proportion of powdered sugar in the formula for *pulv. cretæ gummosus* as "2 parts."

COMMUNICATIONS received from Messrs. Adams, Bird, Braithwaite, Brown, Cocks, Cripps, Elborne, Hill, Laing, Lie, Schneider, Tirard, Umney, and Wright.

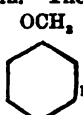
"THE MONTH."

Constitution
of
Anethol.

Two formulæ have been proposed for anethol, differing, however, only in the union of the carbon atoms in the side chain. The formulæ are:—



(i.)
1,4 methoxy-
allyl-benzene.



(ii.)
1,4 propenyl
methoxy-benzene

CH₂:CH:CH₂CH:CH:CH₂

Hell has investigated this question and has proved that the first formula is the correct one, and that anethol, obtained from star-anise oil, and of b.p. 228°-229°, is 1,4 methoxy-allyl-benzene. He has proved this by the preparation of a brominated ketone and ketone acid from the monobromanethol dibromide. When anethol is treated with bromine, three bromine atoms enter the molecule and monobromanethol dibromide is formed, which if the above formulæ are correct would be

(i.) C₆H₅.Br.OCH₂.CH₂.CHBr.CH₂.Br (Allyl),

or (ii.) C₆H₅.Br.OCH₂.CHBr.CHBr.CH₂.Br (Propenyl):

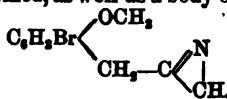
This dibromide on boiling with zinc dust loses two atoms of bromine and yields a polymer of monobromanethol. When the dibromide is oxidised by a solution of chromic acid in acetic acid a (HBr) group is replaced by (O) and a brom-ketone is formed. These brom-ketones would also be derived from the dibromide, and would be

(i.) C₆H₅.Br.OCH₂.CH₂.CO.CHBr.CH₂.Br (Allyl).

or (ii.) C₆H₅.Br.OCH₂.CO.CHBr.CH₂.Br (Propenyl),

or C₆H₅.Br.OCH₂.CHBr.CO.CH₂.Br (Propylene),

being derived from the above formulæ of the dibromide by replacement of (HBr) by (O). On oxidation, bodies of these different formulæ should yield different products, the CH₂Br or CHBr being probably oxidised to COOH. On oxidising the brom-ketone derived from anethol with potassium permanganate, a ketonic acid is formed of the formula C₆H₅.Br.OCH₂.CH₂.CO.COCH₂.Br, which we should expect to be formed if (i.) is the correct formula, and the formation of which could hardly be explained from (ii.). Anethol has, therefore, the first formula, and is para-methoxy-allyl-benzene. During the course of the investigation the acetate of the ketone was formed, as well as a body of the formula—



by reaction of ammonia with the ketone (*Journal für praktische Chemie*, li., 422).

Action of
Permanganate
on Sugar.

When potassium permanganate in aqueous solution is added to a similar solution of sugar, it is reduced to manganese sesquioxide, and E. Maumené finds that this compound is soluble in strong solutions of sugar (1 in 1 or 2 of water), partially soluble in weaker solutions (1 in 3), but insoluble in very dilute ones (1 in 4 or 5). By keeping solutions for some days at a temperature of 15°, as much as 0.5 Gm. of sesquioxide has been dissolved by 15 Gm. of sugar and 30 Gm. of water. It appeared, however, to lose oxygen and gradually become reduced to protoxide, whilst the sugar became converted into hexenoic acid, C₁₁H₁₈O₁₄ (*Comp. rend.*, cxx., 783).

Calcium
Phosphate
in Milk.

L. Vaudin has studied the conditions under which calcium phosphate exists in milk, and finds that the latter contains an alkaline citrate which helps to retain the calcium salt in solution. The solution is due, however, to the part played by lactose in the presence of the alkaline citrate. Every influence which tends to modify or destroy the molecular equilibrium of the salts dissolved in the milk, tends at the same time to precipitate calcium triphosphate with excess of the base in the form of citrate (*Comp. rend.*, cxx., 785).

Milk
Analysis.

According to H. Lescœur, the examination of the serum of milk after coagulation is capable of furnishing useful data in milk analysis. The whey is obtained by treatment with a trace of dry rennet. The coagulated milk is thrown on a filter and the bright serum collected. Normal milk serum has a density of from 1.029 to 1.031 at 15° C., and the weight of the dry extract obtained by evaporation ranges from 6.7 to 7.1 per cent. A milk which gives figures below these limits is regarded by the author as watered. He fixes the following data for the calculation of the amount of added water:—

Liquid taken.	Density of serum at 15° C.	Extrac- tive per 100 C.c. of serum. Gm.
Pure milk.....	1.030	7.0
100 parts milk + 10 parts water ...	1.0275	6.4
" " " 20 " " ...	1.025	5.9
" " " 30 " " ...	1.023	5.45

This method should prove useful in the examination of samples of milk which have clotted from prolonged keeping previous to analysis (*Journ. de Pharm.* [6], i., 395).

Permanganate
as an Antidote
to Opium.

Dr. James Carpenter, of Pottsville, Pa., who has previously testified to the extreme value of the administration of permanganate in cases of opium poisoning, now records another case in which recovery of an apparently moribund patient was brought about by this antidote. The case was that of an infant in a state of profound opium narcosis, due to an overdose of "soothing" syrup. After failing to produce any alleviation of the symptoms by four hours' active treatment, as a last resource 5 minims of saturated solution of permanganate of potassium was injected into the thigh. In an incredibly short time all the alarming symptoms subsided, respiration improved, and consciousness quickly returned (*Therap. Gazette*, March 15, 1895).

Freezing-point
of
Solutions.

Nernst and Abegg show that the discrepancies in the published results of different investigators who have determined the freezing-points of dilute solutions, are probably due to the fact that the observed freezing-points must in general be different from the true freezing-points, or the temperatures at which solid and liquid are in equilibrium, and that the observed freezing-points should be regarded as functions of the size of the apparatus used, the temperature of the cooling-bath, the rate of stirring, etc., etc. A partly frozen liquid, uninfluenced by the temperature of its surroundings, will tend to reach the true freezing-point at a rate proportional to the difference between its actual temperature and that point, whilst

in practice, such factors as the limited amount of substance employed and the effect of the temperature of the surroundings will cause unfrozen liquid to strive to attain a definite "convergence temperature." The observed freezing-point, then, will only be the true freezing-point if the "convergence temperature" is equal to the latter, or if the rate at which the temperature of the partly frozen liquid approaches the freezing-point is infinitely great as compared with the rate at which that of the unfrozen liquid approaches the "convergence temperature." Failing the fulfilment of one of these conditions, experimentally determined corrections must be applied. In the case of dilute alcohol and common salt such corrections were found to be inappreciable, but with sugar, by varying the experimental conditions, a 1 p.c. solution gave molecular depressions of the freezing-point, varying between 1.6 and 2.1—limits even further removed than the most extreme ones given by the results of previous observers (Arrhenius, 2.02; Raoult, 2.07; Pickering, 2.01; Jones, 2.18; Loomis, 1.81). On correction of the observed depressions, however, they all gave practically the theoretical value (*Zeits. f. phys. Chem.*, and *Nature*, li., 617).

Formalin and Food-Stuffs.

Weigle and Merkel have investigated the action of formalin, with the view of ascertaining if it could be used as a food preservative. They find that in the case of milk its use is followed by marked changes in the behaviour of the casein, which, though obscure in their origin, are such as to warrant the prohibition of its use for preserving this food-substance. They also consider that exact investigations should be undertaken, with the object of ascertaining the best means of detecting the addition of formaldehyde, as in the case of boiled milk they were not able to detect it with certainty (*Forschungs-Ber.*, ii., 91).

Determination of Alkaloids.

Dieterich has compared the three following methods for the determination of alkaloid in narcotic extracts and powerful drugs, viz., the Schweissinger-Sarnow method by shaking out, Van Ledden-Hulsebosch by the perforation method, and the Helfenbergether-lime method. His results show a perceptible and regular low percentage by the Van Ledden-Hulsebosch, whilst the ether-lime method shows usually slightly higher figures than the Schweissinger-Sarnow method. The latter he considers sufficiently accurate for practical purposes and very easy to perform. For general accuracy he recommends the ether-lime process, to which, however, there are some exceptions, as for instance ipecacuanha, for which he considers it unsuited. For titration, porcelain basins should be used in the place of glass beakers, using from 1 to 3 drops of solution of hæmatoxylin as indicator. For ipecacuanha, Keller's method yields good results (*Oester. Pharm. Zeitschr.*, xlix., 242).

The First Mercurial Thermometer.

M. Maze points out that sixty-two years before Fahrenheit made such an instrument, a mercurial thermometer was used by Ismaël Boullian (1659). It had an arbitrary scale, the value of a degree being about 10°·7 C., and the zero of the scale at -53°·76 C. The temperature of melting ice would be 5°·34, and that of boiling water 15°·27 (*Comp. rend.*, cxx., 732).

Assimilable Nitrogen.

M. Pagnoul concludes as the result of an extended investigation that heavy rains may carry off from rich lands a considerable amount of nitric nitrogen, but that plants growing on the soil may prevent this loss. Carbon disulphide is found to check the action of the nitric ferment temporarily, besides causing a temporary suspension in the chemical action during the transition stage in which organic nitrogen passes through the ammoniacal form into the nitric form. The nitrous form is also supposed to be an unstable transition state (*Comp. rend.*, cxx., 812).

Separation of Synthetic Remedies.

Lenzinger has examined the behaviour of several new synthetic remedies when treated according to Dragendorff's shaking-out method. From an acid solution he found petroleum spirit removed guaiacolbenzol, guaiacol salicylate, benzophenol, aliphol, sgathin, salacetol, methylsalol, orthocresolol, paracresolol, metacresolol, benzocresolol, malakin, and thermodin, but traces only of guaiacol cinnamate and naphthol carbonate. Benzol removed salophen, pyrodin, guaiacol cinnamate, lactophenin, β -naphtholcarbonate, gallanol, symphorol Na, Li, and Sr; after previous boiling with hydrochloric acid—neurodin, malakin, thermodin, and traces of analgen. Chloroform dissolved pyrodin and analgen. From ammoniacal solution petroleum spirit removed phenocoll; benzol, tolpyrine; chloroform, analgen; amyl alcohol, gallanol (*Pharm. Post*, xxviii., 180).

Vasogen.

G. Kottmeyer has examined Dahmen's vasogen, and finds that when heated on a water bath it loses ammonia gas, and its power of emulsifying with water is simultaneously destroyed, but the latter is restored by passing ammonia gas into the oil after heating. Oleic acid was also found to be present to the extent of about 20 per cent., and a mixture of vaselin oil with 25 per cent. of crude oleic acid and 5 per cent. of absolute alcohol, yielded, when saturated with ammonia gas, the counterpart of vasogen. Vasogen *spiss.* appeared to be a similar mixture of oleic acid with solid vaselin or petroleum jelly, saturated with ammonia. Creosote vasogen can therefore be prepared at about one-fifth of the price of the factory-made preparation, as follows:—Pure creosote, 20; white vaselin oil, 60; common oleic acid, 20-25, ammonia gas, q.s. (*Pharm. Post*, xxviii., 68).

Powdered Ipecacuanha.

According to the French Codex, in powdering ipecacuanha it is essential to reject the last fourth of the drug, and F. Ranwez and O. Campion, considering that this fact and the cost of the entire root were incompatible with the price charged for the powder, have examined sixty-two commercial specimens. Nineteen were found to be adulterated with false cultivated ipecacuanha or entirely substituted by the latter; twenty-four contained an undue proportion of woody fibres, which should have been rejected with the fourth part of the drug that most resists pulverisation; six contained various impurities, one appearing to consist partly of Carthagenia ipecacuanha; four others seemed also to be mixed with Carthagenia root, which, however, is difficult to differentiate; and nine only presented exclusively normal characters (*Annales de Pharm.*, i., 114).

Bismuth Salicylate as a Dressing. Writing to the *Therapeutic Gazette*, Dr. Brindisi states that of all the proposed substitutes for iodoform, he has found none equal to bismuth salicylate, and in certain cases he regards it as even superior to that body, since not only is it odourless, but it does not cause any irritation to the epidermis.

Action of Gelatin on Solutions. Mills and Sawers find that the introduction of gelatin into saline solutions results in the combination of the salts with the gelatin. Chrome alum (potassic) appeared to be taken up unaltered, the resulting compound being quite insoluble in boiling water, but it was slowly dissolved at a gentle heat by an equal weight of acetic acid diluted with about twice its weight of water, the solution leaving an insoluble residue when it dried up. Alumina alum (potassic) was absorbed by gelatin to form a compound, which dissolved slowly in boiling water; nickelous sulphate gave a partly soluble gelatin; cobaltous sulphate a completely soluble one; and cupric sulphate a partly soluble compound (*Journ. Soc. Chem. Ind.*, xiv., 252).

Hæmalbumin. G. Kottmeyer has examined Dr. Dahmen's hæmalbumin, a preparation that has been vaunted not only as a remedy for chlorosis, tuberculosis, and many other diseases, but as a means of prolonging life, and superior in nutritive power to meat. It contains, according to Kottmeyer, 0.26 per cent. of iron, and is neither more nor less than incompletely digested blood. An apparently identical preparation can be made by mixing 50 C.c. of hydrochloric acid and 50 C.c. water with 1000 grammes of defibrinated blood, which then becomes soluble in boiling water. On standing a jelly is produced, which can be broken up by hand and dried (*Pharm. Post*, xxviii., 101).

Casein in Ointments. Casein is employed as an ointment basis by Professor Unna. It is freed from fat by washing with alcohol and ether, then emulsified by the addition of potash or soda (3 parts to 97 of casein), so as to obtain a neutral product. A preparation consisting of casein, 2 parts, and glycerin, 1 part, mixes readily with soft paraffin, 3 parts, the product resembling thick condensed milk. Acids, calcium salts, and other substances which precipitate casein are of course incompatible with it. Tar and balsams should be mixed with one-fourth their weight of green soft soap before incorporating with the casein, and other substances previously brought into a semi-fluid condition by the addition of soft paraffin and water. Such ointments are said to come more intimately in contact with the skin (*Scalpel and Journ. de pharm. d'Anvers*, li., 134).

Poisonous Australian Bushes. Several species of *Gastrolobium*, a genus of leguminous plants, prove very fatal to live stock in Western Australia. Animals eat the foliage and especially the flowers, and the finest and strongest animals are the most easily poisoned, death taking place in about five hours, apparently by paralysis of the action of the heart and lungs. Although the noxious properties of these plants have been known for fifty years or more, no attempt appears to have been made to ascertain the exact physiological action with a view to provide an antidote. An interesting account is given by Drummond in Hooker's 'Journal of Botany,'

[1], vol. iv., p. 82-3; [2], vol. i., p. 93-630, concerning these plants, and in the *Pharm. Journ.* [1], vol. vi., p. 311. Some experiments made on animals with a decoction of one of these plants by Dr. Algernon Frampton (*l.c.*, pp. 312-315), are also on record, but the investigation does not appear to have proceeded further. Now that Western Australia is being opened up more extensively, perhaps these plants may receive more attention. Specimens of *G. grandiflorum* have recently been presented to the Museum of the Pharmaceutical Society, and there is at disposal a sufficient quantity for a preliminary investigation by any chemist or physiologist who may take an interest in the matter.

Veratrum Viride. Green hellebore and its minute structure are discussed in the *American Journal of Pharmacy*, for April, by Professor Edson S. Bastin, who states that he has observed in one instance the fraudulent substitution of the rhizome and rootlets of *Symplocarpus foetidus* for those of *Veratrum viride*. They are larger generally than the latter, have a thicker cortex and smaller starch grains, as well as a characteristic foetid odour.

Free Iodine in Alga. A short time ago, Dr. D. Robertson, the celebrated naturalist of Cumbræ, exhibited at a meeting of the Glasgow Natural History Society a specimen of *Bonnemaïsonia asparagoides*, which had stained the paper blue on which it was mounted. The specimen examined microscopically by Mr. Battles showed that the paper had starch grains on its surface, and that the coloration was due to iodine colouring these grains. This is explained by the discovery of Dr. Golenkin (*Bull. Soc. Imp. Nat. Moscou*, 1894, pp. 257-68), that *Bonnemaïsonia* in drying excretes free iodine. The iodine appears to be contained in the vacuoles of special cells. Herr E. Bruns has pointed out another curious feature in this species. Every branch contains a large number of strongly refringent bodies which are an intense blue in reflected light. These bodies are contained in the enveloping gelatinous layer, but not in the cells (*Ber. Deutsch Bot. Gesell.*, xii., 178 through *Journ. Roy. Mic. Soc.*, April).

Histology of Elder Root. Moeller draws attention to the histological characters of elder root. This root appears to be poisonous in its fresh, but not in the dry state. The distinctive characters of the powdered root are the wide bast fibres, the brown contents of the laticiferous tubes, which appear in the form of spheres, or drops, or in masses, and the fragments of wood with the cells of the medullary rays attached to them. These particulars permit of the powdered root being distinguished from belladonna; if the powder of the latter be prepared from the starchy autumnal root the size and character of the starch grains may also be utilised for the purpose of diagnosis (*Pharm. Post*, xxviii., 113).

Variability of Bacteria. A. Chauveau and C. Phisalix have made an interesting contribution to the study of variability and power of transformation in microbiology, by the discovery of a new variety of anthrax bacillus (*Bacillus anthracis claviformis*). They believe this is derived from virulent *B. anthracis*, though it possesses little or no toxic action, and they have not as yet been able to bring back the new variety to the original form.

It is obtained by inoculating the lymphatic ganglion of a guinea-pig with attenuated anthrax bacilli, and is found to retain in a very slight degree the immunising power of the attenuated culture of the original form (*Comp. rend.*, cxi., 801.)

Oil of Bay. Power and Kleber have examined this oil and separated from it eugenol, myrcene—a hitherto unknown terpene, chavicol, methyl-eugenol, methyl-chavicol, phellandren, and citral, the names of the constituents being arranged according to the relative amounts in which they occur. The specific gravity of the oil varies from 0.965 to 0.985 at 15° C., and is commonly above 0.970, and the amount of phenols present ranges between 60 and 65 per cent., being approximately in direct proportion to the specific gravity. The freshly distilled oil forms a perfectly clear solution with alcohol. It is suggested that the fact that the oil contains no pinene in connection with the specific gravity, may be utilised for the detection of adulterations with oil of turpentine or other oils containing pinene. If 10 C.c. of a suspected oil be taken and 1 C.c. slowly distilled off in a small fractionating flask, the distillate will contain most of the pinene that may be present. On adding to this liquid, in a test-tube, first 1 C.c. of amyl nitrite, then 2 C.c. of glacial acetic acid, and subsequently, whilst the tube is immersed in a mixture of ice and salt and constantly agitated, a mixture of equal parts of glacial acetic and concentrated hydrochloric acids (drop by drop so long as the liquid has a bluish coloration), the presence of pinene will be indicated by a white crystalline precipitate of pinene nitroschloride, $C_{10}H_{16}NOCl$. Ten per cent. of oil of turpentine in oil of bay may thus be detected. (*Pharm. Rundsch.*, xiii., 60).

Sawdust Absorbent Dressings. A. Neve, surgeon to the Kashmir Mission Hospital, India, strongly recommends the use of sawdust pads as a staple surgical dressing material. The sawdust is packed in muslin bags, and the pads are readily rendered either aseptic or antiseptic. In practice they are impregnated the day before use with a 1 in 2000 solution of mercuric zinc cyanide, or sterilised in a Cathcart's or Schimmelbusch's oven (*Lancet*, 3739, 1052).

Bread Substitute for Diabetics. Dr. R. T. Williamson has had prepared a bread substitute for diabetic patients, consisting of cakes prepared from aleuronat and coco-nut powder. Aleuronat is a yellowish powder containing 80 to 90 per cent. of vegetable albumin and only 7 per cent. of carbohydrates. To make it into cakes 2 ounces of desiccated coco-nut powder is mixed with a little water containing a small quantity of German yeast, into a paste which is kept for half an hour in a warm place. The sugar in the coco-nut is decomposed by fermentation, and the paste becomes spongy. Two ounces of aleuronat, one egg beaten up, and a little water sweetened with saccharin are now added, and the whole is well mixed into dough, which is then divided into cakes and baked in a moderate oven for twenty or thirty minutes. If desiccated coco-nut powder be obtained free from sugar, it is then only necessary to mix the whole of the ingredients at once without the intervention of yeast. The cakes are most palatable when newly made, and are improved by being buttered (*Brit. Med. Journ.*, 1791, 922).

THE SOCIETY OF DRUGGIST-APOTHECARIES IN EDINBURGH.

ARTICLES OF ASSOCIATION, A.D., 1785.

We, the persons subscribing, all druggists or apothecaries in Edinburgh, convinced that persons of our profession would derive many advantages from being associated together and having a mutual fund, have therefore voluntarily associated, and do hereby associate, unite, and constitute ourselves into a Society or body collective, under the title and denomination of the Society of Druggist-Apothecaries in Edinburgh, and in order to the establishment of the said Society and to its future regular management, we, the original constituent members, as well as those persons who may afterwards accede to or sign these presents of subsequent dates, do not only unanimously agree to and approve of the following resolutions, but bind and oblige ourselves (each for himself) to obey and conform to the same so long as they shall continue in force and unaltered by the Society in the manner to be hereinafter explained.

And, in the first place, with regard to the members of which the Society shall consist, it is agreed, *primo*, That no person shall be admitted into this Society but Druggists or Apothecaries by profession; *secundo*, That it shall be in the power of the Society, by regulations or bye-laws to be passed in the manner to be hereinafter explained, to require that intrants shall serve a regular apprenticeship, undergo examinations, or have such other qualifications as the Society at the time shall think proper; *tertio*, Every Druggist within Edinburgh or the liberties thereof, or in Leith, having the qualifications required by the Society for the time, may apply for admission, and at the next meeting subsequent to his application it shall be taken into consideration, and if there shall appear a majority or plurality of the members of the Society present at the meeting and qualified to vote in favour of the application, he shall be admitted a member upon his acceding to these presents, or granting and subscribing an obligation to comply with and obey the regulations of the Society then in force; *quarto*, if any member of the Society, after admission, shall refuse to obey the laws and regulations thereof, or shall be guilty of any delinquency, the Society shall be at liberty to fine, censure, or expel him. The power of inflicting a fine or censure shall be in the majority of the qualified members of the Society present at any meeting, and may be exercised in any form. Expulsion shall never take place unless when a regular accusation and complaint is made in writing at one meeting and found relevant to infer expulsion, and the member accused found guilty by the votes of two-thirds of the qualified members present at another meeting where there shall not be fewer members present than two-third parts of the whole Society.

In the second place, with regard to the meetings of the Society, it is agreed, *primo*, That there shall be held annually four general stated meetings, viz., on the first Monday of January, the first Monday of April, the first Monday of July, and the first Monday of October, commencing from the first Monday

of October seventeen hundred and eighty-five, and continuing thenceforth on the days aforesaid in time to come, at such hours and at such convenient places as the Society may from time to time appoint; *secundo*, Besides the above four quarterly stated meetings it shall be in the power of the President at the time, with the advice of a quorum of the Committee or Council aftermentioned, to call an extraordinary general meeting upon the occurrence of any business of importance which could not be delayed till a stated meeting; *tertio*, The whole members of the Society in Edinburgh at the time or within three miles thereof, and capable of attending business, shall punctually attend in person all and every one of the said stated or extraordinary meetings, under the penalty of two shillings and sixpence, to be forfeited and paid by each absent member to the Society *toties quoties*, the penalties to be levied at the meeting immediately posterior to their being incurred; *quarto*, That the members of the Society may have no excuse for non-attendance, the Society shall choose an officer, who shall be obliged to summon each member to attend, at least forty-eight hours before each meeting of the Society, stated or extraordinary, by giving or leaving for him a written or printed summons; *quinto*, No fewer than a majority or plurality of the Society for the time residing in Edinburgh, its liberties or Leith, and qualified to vote shall be deemed a quorum sufficient to constitute a general meeting.

In the third place, with regard to the office bearers of the Society, it is agreed, *primo*, That the office bearers shall consist of a President, a Vice-President, a Committee or Council of five members (of whom the President and Vice-President shall always be two, and of whom any three shall be a quorum), a Treasurer, and a Secretary or Clerk; *secundo*, These office bearers shall all, except the Secretary, be elected and chosen out of the members of the Society, by a majority of the votes of the qualified members present at the meetings held for their elections; *tertio*, the said whole office bearers shall be elected annually, the first election shall take place upon the first general meeting of the Society held after signing these presents, and the next at the general meeting held a full twelvemonth thereafter, and so on annually upon the same day in time to come; *quarto*, members when elected into their offices shall be obliged to accept of them under the penalty of one guinea, with these exceptions, that no member shall be obliged to accept for two years immediately succeeding each other nor for above two years out of every five years, and as the Treasurer is hereby required to find caution for his faithful management of the funds of the Society that no member shall be obliged to act as treasurer, unless two members with whom the Society shall be satisfied shall immediately upon his election declare themselves ready to join with him as cautioners to that purpose; *quinto*, Having accepted of their offices the members elected shall be obliged to execute and perform the duties thereof faithfully, under the penalty of ten shillings and sixpence sterling for each failure *toties quoties*; *sexta*, In the event of any of

the aforesaid offices becoming vacant the same shall, as soon as possible, be filled up by new elections, and in the meantime or in the absence of any of the office bearers, the Society may by a majority of votes choose one of their number to officiate, *pro tempore*, in his place; *septimo*, The duties and business of these different officers, so far as not fixed or ascertained by these presents, may be settled and pointed out by the bye-laws of the Society, to be made and passed in manner hereinafter explained.

In the fourth place with regard to the funds of the Society, it is agreed, *primo*, That the original constituent members shall be obliged immediately after signing these presents to pay to the Treasurer, to be elected by the Society, one guinea each towards raising a fund for the purposes of the Society, and every person to be admitted afterwards shall be obliged to pay to the Treasurer the sum of two guineas, or such other sum as shall be afterwards fixed, as entry money by the Society; *secundo*, The whole original members, as well as those who may be afterwards admitted, shall annually contribute and pay to the Treasurer for the time one pound sterling, and that by four equal portions or moiety, one whereof to be payable at each of the aforesaid stated meetings of the Society before mentioned, during the lives of the members and their continuing members of the Society, beginning the payment of the first moiety at the first meeting after the entry of each member, with a fifth part more of penalty in case of failure and interest from the time it is due until payment, provided always that it shall be in the power of two-thirds of the Society present at any general meeting to exempt from payment of said annual contribution any member who shall appear unable to pay the same through a misfortune or loss of business, but that only during the continuance of such inability; *quarto*, And for ensuring the more regular payment of all sums whatever due to the Society by members, whether entry money, contribution, money fines, or other sums, it is provided that no member that is in arrear or owing the Society any sum whatever shall be qualified to propose or make any motion, or to vote on any question whatever, nor be capable of being elected or holding any office therein, or of claiming or reaping any part of the benefits thereof, until the whole sums so owing shall be fully paid up, with this provision only that if a member or officer shall fall in arrear he shall hold his office till a new election take place, which it is hereby declared shall not be delayed beyond two general meetings after the member in office has fallen into arrear; *quinto*, It shall also be competent to the Society if the members in arrear continue so for the space of two years to expel them altogether, by which they shall forfeit all right in the Society, or its funds and the same shall accrue to the remaining members; *sexta*, The whole sums of money to be thus collected with the forfeitures and penalties and every other sum which may come into the hands of the Society or their Treasurer shall belong to the Society as a body, and be at their own absolute disposal, and shall be applied to the purposes of the Society; *septimo*, When the Treasurer shall have more

of the Society's money in his hands than will be necessary for answering immediate contingencies, he shall lend out the same at the sight of the aforesaid Committee or Council to such banks or banking houses as the Society may direct : and take notes for the same or bills payable to himself for behoof of the Society, and bearing such interest as can be procured ; *octavo*, But if the funds of the Society shall ever increase so that the Society shall think proper to accumulate into a capital sum or sums, then such capital sums shall be lent out in name of the Society and the securities therefor taken in favour of the President, Vice-president, Treasurer, and Committee or Council before mentioned for the time being, *reminatim*, or to any three of them (who shall be a quorum; the Treasurer while in office being always one and *sine quâ non*), and to their assignees as trustees for behoof of the members of the Society, to whom the said trustees shall always be liable and accountable *pro rata* for the whole acts and deeds in relation to these premises ; *nono*, The rights to all property to be acquired or purchased by the Society shall be taken and conceived in the same terms ; *decimo*, no part of the Society's moneys shall be lent at any time to any member or members thereof, nor shall members be received as cautioners with others thereof ; *undecimo*, None of the sums belonging to the Society excepting salaries or usual contingencies shall be paid away or lent out without a special resolution of the Society for that purpose.

In the fifth place, with regard to the objects and purposes of the Society and their mode of carrying on business in time coming, it is agreed, *primo*, That the object and purpose of this Society is the regulation of their trade concerns, and the uniformity of the retail prices, but not of the wholesale prices, which are hereby declared to be excluded, and also the management and disposal of their funds ; *secundo*, As from the nature of this business it must be continually varying, so no further regulations can at present be made about it, but it shall be in the power of all and each of the members, from time to time, to prepare such new regulations, laws, resolutions, or motions as he may think for the benefit of the Society ; *tertio*, Such proposals shall always be made in writing and presented to the Society at the meeting before they shall be decided upon ; *quarto*, If these proposals, motions, or questions shall be made with a view to repeal or alter any of the fundamental rules of the Society as laid down in these presents, they shall be rejected, unless there appear in their favour three-fourths of the whole members of the Society ; but if they are for carrying into execution the purposes of the Society in a consistency with these presents, if there shall appear a majority of the members present and qualified to vote at the meeting, when they are discussed, in their favour, they shall be passed into a bye-law and become binding on all the Society ; *quinto*, In the course of discussing all business the President shall have power to regulate the debates, and to impose fines for irregularities ; *sexto*, When the votes of the members present shall be equally divided, the President's vote shall be taken

and shall be decisive ; and lastly, WE, the Whole members of this Society, hereto subscribing Do Hereby Bind and Oblige ourselves strictly and punctually to fulfil, obey, and conform to the regulations, conditions, and provisions herein contained, and also to all such other regulations, bye-laws, orders, and resolutions of this Society as shall be made, agreed to, or enacted in the forms herein prescribed, and that according to the spirit and intention of the same. And that we may the more effectually bind ourselves to abide by and fulfil the intention of this Association, we do hereby (each for himself) give and grant full power, authority, and commission to the President and Secretary of this Society for the time being, for us and in our name, and for behoof of each of us to sign and subscribe in the sederunt books of the Society all such regulations, orders, bye-laws, or resolutions as shall be passed or agreed to in terms of these presents, or the regulations of the Society for the time ; Declaring hereby that the same being signed by the President and Secretary, shall render them as binding and obligatory on us and each of us as if we had each signed the same himself before witnesses, and with every other solemnity required by the law of Scotland to render Deeds obligatory, renouncing hereby all objections and exceptions to the contrary, and we consent to the registration hereof in the books of Council and Session or of any other competent Court that letters of horning on six days' charge, and all other needful execution may pass hereon as effects and thereto constitute * * * * * our Procurators.

In Witness Whereof these presents written upon stamped vellum by John Patison, Writer in Edinburgh, are subscribed by us as follows, viz. :— William Hutchison, druggist, Foot of Forester's Wynd, Cowgate ; James McDonald, druggist, West Bow ; Archibald Napier, druggist, Head of Forester's Wynd, High Street ; William Vivers, chemist, Netherbow ; Cumberland Moffat, druggist, Netherbow ; Kenneth Mackenzie, druggist, Head of Cant's Close, High Street ; William Kinnaird, chemist, Foot of Horse Wynd, Cowgate, John Moncrieff, apothecary, 17, North Bridge, Edinburgh ; George Gray, apothecary, Grass Market, opposite Corn Market (east end) ; James Maltman, druggist, Foot of Forester's Wynd, Cowgate ; Thomas Boog, apothecary, Head of Canon-gate ; James Gardiner, druggist, Paterson's Court, Lawnmarket ; William Dempster, apothecary, opposite Fountain Well, Canon-gate ; Robert Scott, druggist, High Street ; Alexander Reid, surgeon and apothecary, St. Patrick Square ; Peter Lyon, surgeon and apothecary, James' Court, Lawnmarket ; Ivie Campbell, apothecary, Bull Turnpike, at Edinburgh, the third day of October, one thousand seven hundred and eighty-five years, before these witnesses, John Stewart, vintner, Old Fishmarket Close, Edinburgh, and the said John Patison, Theatre Row, and by Samuel Stevenson, surgeon and apothecary, Leith Wynd, Edinburgh, the tenth day of February, one thousand seven hundred and eighty-six years, before these witnesses : John Watson, house painter, Hyndsford's Close, Canon-gate, Edinburgh, and James Spence, writer, Old Bank Close, High Street, Edinburgh, the place, date, witnesses' names, and designations being filled up by the said James Spence.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MAY 4, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 6, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brembridge, —17, Bloomsbury Square, London, W.C.

CRAM versus EDUCATION.

At a meeting of the College of Preceptors held last week, an important paper was read by Mr. G. HEPPEL, M.A., on the use and abuse of the term cramming. At the beginning of this the essayist quoted the late Dr. TODHUNTER, as saying that he thought it had been a grave error in discussions on examinations, instead of clearly stating what may be said to be their advantages or disadvantages, to diverge into abuse of an ill-defined phantom called cram. Now, the definition of the verb "to cram," as given in the 'New English Dictionary' runs thus:—"To prepare (a person) for an examination or special purpose, in a comparatively short time, by storing his memory with information, not so much with a view to real learning as to the temporary object aimed at." That is to say, cram on the part of a student is a mechanical operation, totally differing in its methods and aims from education, the end and aim of which is to train the mind in such a way as to enable the individual to apply his past experience to future advantage. The storage of any collection of facts in the mind may be defined as cram, which in this wider sense is perfectly justifiable on occasion, and since preparation for examination invariably involves the concentration of one's information on the necessary subjects, in such a manner as to have it available at a given time, it may not unreasonably be urged that such preparation for examination must in the very nature of things involve to a great extent a method of cram. If this be granted it becomes necessary to discriminate somewhat and not brand all cram alike, as evil in itself.

The worst form of cram is undoubtedly that by means of which a delusive show of knowledge is made to pass muster in an examination, as though

it were the outcome of a proper course of education. This is what is properly described by Dr. MURRAY, in a second definition of the verb—"To 'get up' (a subject) hastily for an occasion, without any regard to its permanent retention or educative influence." Experience has shown, however, that by choosing suitable individuals as examiners—not mere pedants or theorists, but persons with a knowledge of human nature as well as of the subjects in which they are assumed to be experts—such artificial profundity is easily exposed, and the borrowed learning fails to produce results satisfactory to the candidates. As the author of the paper already referred to remarks, the instructors must follow the lead of the examiners, and, if the latter examine badly, the teaching must deteriorate in order to meet their requirements. If they encourage cramming—using the word in its worst sense, as implying the temporary accumulation of a mass of more or less useless facts—then the tutors will resort to cram. "If it were the custom of the history examiners to set such questions as, 'On what day did Lord SUNDERLAND die? What was the state of the weather? Did it rain that afternoon?' I firmly believe the private tutors would use all their energies to devise some plan to meet the difficulty." In the same way encouragement is given to cram of an objectionable nature by the setting of such questions as, "Name all the plants you know in the genus 'Rubus'! Give a list of compounds derived from benzene! What tinctures are prepared with proof spirit?" When questions of this class are the rule at a given examination nothing is easier than for private tutors to prepare their pupils to undergo the ordeal with credit to both teachers and taught, and education properly so-called is at a discount.

Whilst, therefore, the essential difference between a thorough system of education and mere preparation for examination is very great, the fact must be recognised that the existing prejudice against cram is to some extent unfounded, and the method must be tolerated so long as examinations persist. Even when the previous course of training has been most thorough, a final course of cram is in most, if not all, cases found useful, and in many instances of real merit becomes an absolute condition of success, for without it the best trained man may find difficulty in concentrating his genuinely acquired knowledge for examination purposes, whilst his uneducated companion who has simply been crammed for a few weeks or months glibly furnishes replies to numerous questions, and may, perchance, by a stroke of luck manage to satisfy the examiners. There is one remedy, and one only, for this state of affairs, and that is to insist upon a satisfactory course of training being undergone prior to examination. No other plan is likely to remove the difficulty except to a very limited extent, and cer-

tainly no other means will avail to secure that candidates for professional positions shall have been properly educated, and not merely prepared for examination or "crammed." The medical profession has long since accepted this view of the situation, and, sooner or later, pharmacy must needs follow suit.

COD-LIVER OIL AND CHEMISTRY.

THE title of Dr. MÖLLER's book—Cod Liver Oil and Chemistry—leads one to wonder whether all chemical substances of pharmaceutical or industrial interest are destined to have books of 500 quarto pages devoted to them. It is to be hoped that in any case the present volume will not be taken as a type, for although monographs on special subjects are always welcome, it would be most undesirable to fill bookshelves with bulky volumes on malt extract and chemistry, BLAUD's pills and chemistry, pepsin and chemistry, and the like. Surely if Dr. F. PECKEL MÖLLER feels that he is inspired to write on cod-liver oil and chemistry, it would be both more satisfactory to himself and to his readers if his subject matter were placed in two separate covers, as it must be unusual to find readers who are interested in the new method of preparing cod-liver oil which PETER MÖLLER devised and in stereo chemistry, at one and the same time. Notwithstanding this criticism, it is only fair to admit that there is a very close relationship between cod-liver oil and chemistry, and pharmacists generally would no doubt be glad to have welcomed a book on the chemistry of cod-liver oil, as this subject has recently received much attention at the hands of chemists.

So far as it is possible to form an opinion from a careful review of this work, Dr. MÖLLER does not consider the chemistry of cod-liver oil to be that portion of the scope of his book upon which he is specially qualified to write, as the thirty odd pages devoted to the chemical constitution of the fats and active principles existing in cod-liver oil have been interpolated into the volume and are contributed by Mr. P. M. HEYERDAHL. It is these few pages which will be of interest to the readers of the *Pharmaceutical Journal*, as they form an admirable résumé of the work which has been done on this oil. Ever since WURZER in 1822 first noticed that it was possible to obtain from cod-liver oil an aqueous extract of a viscous yellow substance, acid in reaction and bitter to the taste, chemists have from time to time devoted their attention to this animal product with a view of ascertaining the nature of the various compounds which are present in it. Even at the present time there seems to be a difference of opinion as to what the essential ingredients to which its undoubted beneficial action in phthisis and other wasting diseases is due. HEYERDAHL, however, is of the opinion that the

active principle in cod-liver oil is the fat itself, and differs from CHAPOTEAUT, GAUTIER, and MOURGUES, who incline to the view that morrhual or the mixture of ptomaines in the oil confers upon it its peculiar beneficial properties. It seems difficult to believe that the fat *per se* in cod-liver oil is any better food-stuff than other similar glycerides existing in cream or other oil, but on the other hand it is hard to conceive that the wine of cod-liver oil in which all the fats have been carefully removed should have the same virtues as the oil itself. It would seem better to accept a compromise between these two views and to say that cod-liver oil is a valuable food-stuff in consumption, because some or all of the small quantities of compounds, other than fat, present in it facilitate the assimilation of the cod-liver oil fat. It ought to be easy to ascertain the actual facts, as it is firmly established that cod-liver oil contains from 95 to 98 per cent. of olein, palmitin, and stearin, and any oil containing 25 per cent. of stearin and palmitin with 75 per cent. of olein would represent the fats of cod-liver oil very closely. Such a mixture carefully tested clinically against cod-liver oil and the equivalent of morrhual would establish this much debated question.

As might be expected, Dr. MÖLLER has a very unfavourable opinion of the many substitutes which have been proposed, and even the fish oils, such as eulachon oil and dugong oil, are condemned because they are not liver oils, and because they are more viscous, but why viscosity should be a measure of its therapeutic value it is difficult to conceive. Amongst the proposed substitutes for cod-liver oil there is no mention of the viscous hydrocarbons derived from petroleum, which from time to time have been introduced as cod-liver oil substitutes. These might have rightly been adversely criticised as not being glycerides, and therefore not fat-formers in the true sense, but deserve mention in the author's category of substitutes. With regard to the refining of cod-liver oil, the author's well-known process is naturally advocated, and HEYERDAHL's researches lend support to the theory upon which it is based. It seems, however, strange that cod-liver oil should not owe its rancidity to the presence of free acids, but that the formation of hydroxy-acids is the true cause of the rancidity. The acetyl value of cod-liver oil is therefore the practical test according to Dr. MÖLLER as to the therapeutic and consequently commercial value of a cod-liver oil, and oxidation should be prevented as far as possible not only in its manufacture, but also in storing, and especially when in small quantities.

Having discussed cod-liver oil and its commercial preparation, the author devotes the second portion of the book to the consideration of what is called "the law of atomic linking, diagrammatically

illustrated." It begins with the interesting statement that "curiosity is our common inheritance from mother Eve," and finishes with the equally important conclusion that "there are still formidable difficulties to surmount, and many yet unborn theories will come and go before chemists, mathematicians, astronomers, and physicists shall agree on all points, and even then we shall still be far away from that ultimate simplicity which we shall never know—the truth." Between these two sentences is massed the whole of organic chemistry in a novel and startling form. Dr. MÖLLER gives a diagram of each substance which he thinks aids in the elucidation of the subject, but as he omits all general methods of synthesis and analysis, the book is little more than a hotchpotch of organic substances, incompletely described and indifferently classified. The names used are partly English and partly German, but it is impossible to give any adequate idea of the nature of the work without the illustrations, which constitute its one important feature.

ARGON AND THE PERIODIC LAW.

A POSSIBLE solution of the difficulty which is experienced in allotting a place to argon in MENDELÉEFF'S table, was suggested by Dr. BOHUSLAV BRAUNER at a recent meeting of the Chemical Society, in connection with his re-determination of the atomic weight of tellurium. After describing the abnormal results yielded by tellurium prepared in various ways, Dr. BRAUNER stated that he was inclined to believe that argon was one of a new group or mixture of elements—the "Argon Group"—coming between the last two groups of the periodic system, and observed that, if we assume what we know as tellurium to be a "mixture or alloy or compound" of the true tellurium with "argon No. 4" or "Triargon," it would consist of equal atoms of the two, its formula being Te_2A_2 , and its composition corresponding with the atomic weight, 127.71, which he has obtained.

ELECTROLYSIS AND CHEMICAL INDUSTRY.

ONE of the most striking aspects of the chemical industry of to-day, remarks the *Electrical Review*, is the encroachment of electrolytic upon the strictly chemical processes. In some branches, electrolysis is described as already confidently fighting for supremacy, whilst, in others, an invasion is threatened. Since, however, the minds of manufacturers are to-day more open to the reception of new ideas than they used to be, and they are willing to profit by experience from the many cogent object lessons they have received in the past, it is not anticipated that the fight will be carried on by them with the weapons of prejudice, and of that conservatism which is held to be characteristic of

the English as a race. As relevant to this question the following quotation from the chairman's address at the opening of the new session of one of the provincial sections of the Society of Chemical Industry, is of especial interest. "That there are scores of busy, clever, and eager brains working away, endeavouring to bring these processes (electrolytic processes of making chemicals) into successful operation is patent to us all, and it behoves us to prepare for the invasion of this inventor as for that of all other inventors, and when he has won his spurs and proved his case, to welcome him with open mind, and by timely enterprise to show that we willingly accept and can promptly profit by the invasion of the true and real inventor."

WEIGHTS AND MEASURES ACT.

A SELECT Committee of the House of Commons is now inquiring into the working of the Weights and Measures Act, and several leading pharmacists are amongst those summoned to give evidence. On page 986 we publish the gist of the evidence given by Mr. CHARLES UMNEY on Tuesday afternoon last, and this should prove of considerable interest to our readers as representing the position of leading wholesale drug houses in the matter. It is satisfactory to observe that, whilst Mr. UMNEY is of opinion that British trade suffers no disadvantage by the continued use of imperial weights and measures, he has also expressed his strong conviction that the metric system should be used in the next edition of the British Pharmacopœia if it is to possess the inter-colonial and international character that ought to be an essential of such a work.

EVENING MEETING IN EDINBURGH.

THE document described as "The Bond of the Society of Druggist-Apothecaries in Edinburgh," and reproduced at page 964 of this week's Journal, possesses an especial interest as throwing light on the conditions of pharmacy in the Scottish capital a century ago, and also indicating the steps that had been independently taken there to combine pharmacists into a properly organised body, long before the inception of the Pharmaceutical Society. As pointed out at the Evening Meeting, the old Edinburgh druggists appear to have been considered no whit less important than the apothecaries, and even to have been conceded precedence to some extent by the latter. Altogether, the document now brought to light by Mr. JAMES MACKENZIE is of great importance from a pharmaceutical and historical point of view. As usual, the papers read at the meeting were of considerable value and varied interest. Pressure on our space prohibits the whole of them being published this week, but the remainder will appear at an early date.

ANNUAL DINNER.

A FULL list of Stewards in connection with the Annual Dinner of the members of the Pharmaceutical Society and their friends will be found in the advertisement columns of this week's Journal. Other gentlemen desiring to act as Stewards should send in their names to the Secretary, Mr. RICHARD BREMIDGE, 17, Bloomsbury Square, W.C., without further delay. The Dinner takes place on Tuesday, May 21, and those purposing to attend should make early application to the Secretary for tickets.

Transactions of the Pharmaceutical Society of Great Britain.

EVENING MEETING IN EDINBURGH.

Friday, April 26, 1895.

MR. J. LAIDLAW EWING IN THE CHAIR.

The fourth evening meeting in Edinburgh of the present session was held in the Society's Hall, 36, York Place, on Friday, April 26, at 8.30.

The minutes of the last meeting having been read and approved, apologies for absence were intimated from Messrs. P. Boa, and J. Nesbit.

The following communications were then read:—

FERROUS PHOSPHATE.

BY GEORGE COULL, B.Sc.

Before proceeding to state the results of a few experiments, undertaken as indicated at our last evening meeting with a view to the preparation of ferri phosphas having a higher percentage of ferrous phosphate than the present Pharmacopœia demands, it may be profitable to give a short historical sketch of the compound as showing the gradual evolution of a pharmacopœial preparation and the length of time it takes to arrive at even approximate perfection.

Ferri phosphas was not official in the pharmacopœias of the London, Edinburgh, or Dublin Colleges; it was introduced into the first edition of the British Pharmacopœia in 1864, and has retained its place in each successive edition. Previous to 1864 it was official in the U.S.P., its first appearance being in 1840. It was then made by mixing solutions of sulphate of iron and phosphate of soda, decanting, washing with hot water and drying at a gentle heat (it is not stated how the washing is to be done). This manner of preparing it was continued till 1880, when the ferri salt became official, the name still being ferri phosphas. The process now was to dissolve ferri citrate in water, add sodium phosphate, dissolve, evaporate, and scale. This method is at present official with a slight change in the quantity of sodium phosphate ordered, and instead of being called as has been suggested sodio-ferri citro-tartrate, it is named ferri phosphas solubilis.

Unlike the Americans, we have adhered as far as we could to the ferrous salt. The formula for its preparation was the same in the 1864 and 1867 Pharmacopœias, acetate of soda being added to have acetic acid set free in place of sulphuric, on the assumption that the former had less solvent action than the latter on ferrous phosphate. In 1867 the temperature of drying was raised from 100° F. to 120° F., and a standard of ferrous salt fixed, this percentage according to the volumetric determination was 44.75 per cent. of anhydrous ferrous phosphate = 62.75 per cent. of the hydrated salt, $\text{Fe}_2\text{PO}_4 \cdot 8\text{H}_2\text{O}$. In the present Pharmacopœia it is defined as "Ferrous phosphate, $\text{Fe}_2(\text{PO}_4)_3 \cdot 8\text{H}_2\text{O}$, at least 47 per cent.; with ferri phosphate and some oxide," this percentage is equivalent to 33.5 per cent. of anhydrous phosphate. The sodium phosphate is slightly increased and sodium bicarbonate is used in place of acetate for the purpose

of neutralising the sulphuric acid set free. This valuable suggestion was due to Howie (*Ph. J.* [3], vi., 807), although Schweitzer (*Ph. J.* [2], i., 496) suggested the use of carbonate of soda as far back as 1860. This is our present position on the way to finality.

Let us now review the literature of the subject which, unlike that of spiritus ætheris nitrosi, vinum ipecacuanhæ, and perhaps a few others, is not very voluminous.

At the same meeting at which Schweitzer suggested the use of carbonate of soda, Gale gave a formula for syrupus ferri phosphatis, his process for the preparation of phosphate of iron was essentially the same as that in the earlier editions of the U.S.P., no allowance being made for the loss of phosphate through its solubility in sulphuric acid.

There have been the usual examinations of trade specimens with the suggestions which inevitably follow. In 1874, Druce (*Ph. J.* [3], iv., 729), examined ten samples, one of which, however, was arseniate, and another was made by himself and mixed with an equal weight of sugar *after drying* (my italics). He found this latter sample to be above the pharmacopœial standard as 104 is to 100. I may here interpolate in passing that this is a very unsatisfactory way of stating results, productive of some little trouble to those who wish to make use of the work done by others for purposes of comparison; they should be given as percentages of the substance that is to be determined in the sample, adding the percentages, if thought necessary, taking the pharmacopœial standard as 100. Now the standard at that time was 44.75 per cent. of anhydrous phosphate = 62.75 per cent. of hydrated salt, and consequently this sample contained 46.54 per cent. of anhydrous = 65.28 per cent. of hydrated ferrous phosphate. The sample was mixed after drying with an equal weight of sugar; it must, therefore, have contained before being diluted 93.08 per cent. $\text{Fe}_2\text{PO}_4 = 130.52$ per cent., $\text{Fe}_2\text{PO}_4 \cdot 8\text{H}_2\text{O}$, which I can hardly credit. The probable explanation of this is that the paper having been written before Howie called attention to the action of hydrochloric acid on sugar, in all likelihood heat had been employed to effect solution, hence this high result. In the *bond-fide* samples he found the strength to vary in percentage of the pharmacopœial standard from 2 to 100.1, these calculated into percentages of real phosphate are .895 to 44.79 per cent. of anhydrous = 1.255 to 62.81 per cent. of hydrated ferrous phosphate. The suggestion made is to mix the freshly washed precipitate with sugar, so that the powder dried at 140° might represent 50 per cent. of ferrous phosphate, and call it ferri phosphas saccharata.

Cleland (*Chemist and Druggist*, xliv., 277) found commercial samples to contain from 23.27 to 29.35 per cent. anhydrous ferrous phosphate, and makes the same suggestion that Druce made twenty years before, namely, to mix it with sugar and call it ferri phosphas saccharata. But in addition he would introduce several refinements, such as precipitating the phosphate in a saccharated solution, washing with a similar solution, and evaporating to dryness *in vacuo*.

Lothian and Hoseason in 1890 (*Ph. J.* [3], xxi., 511)

examined twelve commercial samples of ferrous phosphate. The average of anhydrous phosphate was 26.39 per cent.; the poorest sample contained only 9.84 per cent., and the best 44.75 per cent. The latter and one containing 34 per cent. were the only two which reached the official standard. They note that the samples which were bulky and greenish in colour showed a lower proportion of ferrous phosphate than those which were denser and of a more slate-blue colour; this I can fully corroborate. Their recommendation is to use hot concentrated solutions, so as to have the precipitate as dense as possible. This I cannot agree with here, although it is sometimes the correct thing to do; for example, in making the carbonates of magnesia. At the British Pharmaceutical Conference (1875) the President, in discussing Daniels' paper on the "Phosphate Syrups," said he mixed the solutions hot and boiled them, as he got a granular, easily washed precipitate in that way (it was not mentioned if the percentage of ferrous phosphate in the precipitate had been determined) and advocated the use of carbonate as giving better results.

The next paper calling for attention is one by Price in 1876 (*Ph. J.* [3], vi., 701), where it is first noted that there is a considerable loss of ferrous phosphate, even when using acetate of soda, and that the hot water used for solution causes slight oxidation of the sulphate of iron. His suggestion is to rather more than treble the quantity of phosphate of soda, and to use cold water for dissolving the salts, mix, heat gently for a few minutes, allow the precipitate to settle, throw on calico filter, and wash with cold water. The last and most important paper on the subject I shall refer to is by Howie (*Ph. J.* [3], vi., 804), read a few weeks after the one by Price. In an exhaustive communication to the North British Branch on "Phosphate Syrups," Howie goes very thoroughly into the chemistry of ferri phosphas. I may here state that I very nearly missed seeing this paper, and only alighted on it by chance after my plan of operations had been settled and my samples made.

Six commercial samples he examined contained 46, 46, 38.7, 36, 34.3, and 20.7 per cent. of anhydrous ferrous phosphate. The B.P. standard at that time being 44.75 per cent., the first two alone came up to it, although, according to the 1885 Pharmacopœia, they would all pass but the last one. He stated that the B.P. standard could readily be passed with proper manipulation, and showed a specimen containing 59 per cent. = 82.7 hydrated.

Briefly put, Howie found that sometimes a bulky precipitate was obtained, and at others the same chemicals and *seemingly* (my italics) the same manipulation produced a dense white precipitate, occupying much less bulk than the former. When cold water was used for solution the precipitate was bulky and greenish, with water above 180° F. the precipitate was bulky and, to some extent, gelatinous, and could not at once be washed by subsidence. If the temperature be about 130° F., and the soda be added to the iron, the precipitate will be nearly white and will subside rapidly, and it can be

thoroughly washed by decantation in a very short time. He thinks the limits of temperature for the formation of this granular precipitate to be from 100° to 135° F.

Therefore Howie recommended (in addition to the use of sodium bicarbonate already referred to) that boiling water be used to dissolve the salts, and that when the temperature has fallen to 130° F., the solution of mixed soda salts be poured into the solution of sulphate of iron with constant stirring. These suggestions have been adopted in the B.P., 1885, only the soda salts are directed to be added separately. He also recommended that the precipitate be washed by decantation, and that the whole operation be conducted rapidly. The facts upon which the order of mixing is suggested are that on pouring the iron solution into the solution of the mixed soda salts, he got a precipitate containing 32 per cent. anhydrous ferrous phosphate, while by adding the soda phosphate to the iron solution and then pouring in the bicarbonate solution, he got a precipitate of which 51 per cent. was anhydrous ferrous phosphate. There is no evidence in the paper that he tried the effect of adding the iron to the phosphate of soda and then pouring in the bicarbonate. He notes that the phosphate is best precipitated in an acid solution, and hence adds the bicarbonate last, but if instead of adding the iron solution to the mixed soda solution as in the first experiment (where the acid is neutralised as soon as it is formed, and hence the precipitation is conducted in an alkaline solution) he had added the iron to the phosphate and then poured in the bicarbonate, he would have got a still higher result, and the precipitate would have been formed in an acid solution.

It was, as previously stated, owing to recent batches of this varying from 47 to 70 per cent. of $\text{Fe}_2\text{PO}_4 \cdot 8\text{H}_2\text{O}$ that my attention was given to the subject. I was extremely astonished at getting 70 per cent., and thought at first a slip had been made somewhere, but repetition of the determination several times gave the same result, and when another lot gave 69.3 per cent. confidence in myself which had received a rude shock was again restored.

The object of my experiments was to ascertain whether washing by decantation was more advantageous than washing on a calico filter, whether the temperature of the solutions had any effect on the oxidation of the precipitate, and whether adding the iron to the soda would result in giving a higher percentage of ferrous salt.

As I stated above, I was not aware of Howie's recommendation to wash by decantation (although it is the method I always employ), still, the work does not go for nothing, as it is useful in fully confirming him on that point. The range of temperature, 100°–130° F., appeared too great, and an attempt was made to fix the most suitable one. The idea of trying the effect of adding the iron to the soda was the result of considering how the scale compounds and some other iron preparations are made. In the case of ferri et ammonii citras, ferri et quinine citras, ferrum tartaratum, ferri peroxidum hydratum, and liquor ferri acetatis fortior, preparations where ferric hydrate is

formed by the action of an alkali on the persulphate, we are in each case explicitly told to add the iron solution to the alkali.

Attfield says in his manual in discussing the scale compounds that this mode of procedure is to obviate the formation of ferric oxysulphate. It seemed probable, therefore, that there was any danger of a ferric salt becoming oxidised by being acted on in a certain way, there would be more chance of a more readily oxidisable ferrous salt being oxidised by being treated in a precisely similar manner. It is satisfactory to know that the following experiments fully bear out this view.

Six samples of ferri phosphas were accordingly made, the conditions being varied in each case. The following applies to all the samples:—They were made at the same time, B.P. quantities being employed, they were washed for the same length of time, and were all free from sulphate, the percentage of ferrous phosphate in them was determined with volumetric solution of potassium bichromate freshly made from a recrystallised salt.

When the washing of those that were done on calico was completed, they were simply tied up in the filter and hung in a drying room, where a thermometer placed alongside showed that the temperature was usually about 90° F., it never rose to 100° F. Those washed by decantation were transferred, when the last wash-water was siphoned off from the pottles they were washed in to calico strainers, and when drained were tied up and dried in a similar manner. These were also diluted after precipitation with a considerable quantity of water, about one gallon for each. Further details are given in the table and following remarks:—

No.	How washed.	Temp. of solutions.	How mixed.	$\frac{N}{10} K_2Cr_2O_7$ required for $\frac{1}{2}$ Gr.	Fe_2PO_4 per cent.	$Fe_3PO_4 \cdot 3H_2O$ per cent.
1	On calico	130° F.	Soda to iron	C.c.		
2	"	100° F.	" "	19.7	35.26	49.45
3	"	110° F.	Iron to soda	20.8	37.23	52.21
4	By decantation.	130° F.	Soda to iron	24.9	44.57	62.50
5	"	100° F.	" "	22.6	40.45	56.73
6	"	110° F.	Iron to soda	24.5	43.85	61.49
	Standard in 1867 Pharmacopœia			26.1	46.72	65.51
	" 1885				44.75	62.75
					33.50	47.00

In preparing No. 1 the B.P. directions were exactly followed, the temperature of the solutions before admixture being 130° F. No. 2 was prepared in a similar manner, but the temperature of the solutions was allowed to fall to 100° F. before they were mixed. In the case of No. 3 a pint of water at 110° was used to dissolve the sulphate of iron, the phosphate of sodium was dissolved in a pint and a half of hot water, when the latter had cooled to about 110° the temperature of the former solution was brought by the addition of half a pint of water of suitable temperature to 110°, the ferrous sulphate was then added to

the sodium phosphate, and finally the sodium bicarbonate dissolved in a little tepid water was poured in. It was washed with cold water.

Nos. 4, 5, and 6 were prepared as Nos. 1, 2, and 3 respectively, but washed by decantation.

There was a marked difference in the appearance of the precipitates while being washed on calico. No. 1 was bulky and gelatinous, and the exposed surface was always of an emerald green colour, while the bulk of the precipitate was of a dirty greenish-white shade. It would not mix well with the wash water owing to its gelatinous nature.

No. 2 was bluish on the surface and bluish-white underneath, it was less bulky than No. 1, and more easily diffused through the wash-water.

No. 3 appeared to be more granular or crystalline than the other two; it was also the densest, and soon became dark blue throughout. It was easily washed with cold water.

The appearance of the lower portion of the precipitates could be seen more readily in those samples that were washed by decantation in a bottle.

When precipitated and diluted, No. 4 settled the most slowly; the precipitate appeared greenish, with a slightly yellow tinge.

No. 5 settled more quickly than No. 4, the precipitate was distinctly greenish.

No. 6 subsided the most rapidly, and the colour of the precipitate was pale blue.

All three gradually darkened during the washing. A fresh quantity of water having been added to them at night and allowed to settle till next morning, I took the opportunity of determining roughly the relative bulk of the three precipitates. They were all in twelve pint pottles of same height and diameter. Precipitate No. 4 measured 2½ inches in depth. With the aid of one of Aspinall's show-cards, I ascertained that the exact shade of the precipitate was sky-blue with a layer of emerald green on the top. No. 5 measured 1½ inch, the mass of the precipitate was a shade darker than No. 4, while the top layer was like that on No. 6, but a trifle lighter. No. 6 measured 1¼ inch, the precipitate was powdery, and appeared bluish, with a darker layer of slate-blue on the top.

The appearance of the samples after drying is also rather interesting. They were all hung up to dry at the same time, and kept in the drying room for the same period, with the exception of Nos. 1 and 4, which required a day more than the others before they were considered dry, and even then No. 1 was hardly quite dry.

This extra time required by Nos. 1 and 4 is owing to the gelatinous nature of the precipitate, which clung most persistently to the adherent moisture. When dried these two were in the form of lumps, necessitating the use of a mortar before they could be sifted. The others were in the form of a fine dry powder, especially Nos. 3 and 6, which did not even require to be sifted.

From the specimens on the table it will be seen that No. 1 is green in colour and No. 6 dark blue, the others being lighter shades of blue than No. 6. It

may be noted that Nos. 2 and 4 have almost the same colour, and similarly Nos. 3 and 5 are almost alike. The yield in the case of Nos. 5 and 6, namely $1\frac{1}{2}$ of ferri phosphas from 3 of ferri sulphas, is what I almost always get in actual practice. I have here a sample that was made before the six just mentioned. I meant to prepare them one at a time, but when the appearance of this one was seen, it was deemed advisable to get them all made at the same time. I was under the impression that it had been overheated, but this could not have been the case as it was never above 100° F. It is, as you may observe, a very pale shade of green, and before being rubbed up and sifted it consisted of hard knots of various sizes; it contains only 11.63 per cent. of anhydrous ferrous phosphate. As this sample was a considerably longer time in the drying-room than the others, it must necessarily have been this extra exposure that caused the oxidation.

The above results then which are strictly comparable among themselves, show:—(1) That decantation is superior to washing on calico. (2) That prolonged exposure to the air even at the moderate temperature of 90° to 100° F. has a strong oxidising action on the phosphate. (3) That 130° F. is certainly too high for the solutions to be before mixing. (4) That the range of temperature in the B.P. directions is too great, so that a uniform preparation is not always obtained, and (5) That, all other conditions being the same, a higher percentage of ferrous phosphate can be obtained by adding the ferrous sulphate to the sodium phosphate. Had I known that Howie recommended rapidity of manipulation I would have taken pains to hurry matters, in order to get results higher than I did, which I am sure can with care be obtained. But my manner of operating may be of advantage in this, that it shows how, without any special precautions in this respect, ferri phosphas can be made to attain even unto the standard laid down in 1867.

I would therefore recommend (1) That the present proportions in the formula be retained, being almost theoretically correct. (2) That boiling water be not used to dissolve the ferrous sulphate owing to its oxidising action, but water at about 110° F. be employed, the temperature of the solution being adjusted to that before admixture with the phosphate (as a corollary, the solution of sulphate of iron in the appendix should be made with water recently boiled and cooled). (3) That the ferrous sulphate solution be added to the phosphate, and then the solution of bicarbonate poured in. (4) That after precipitation the mixture be considerably diluted with water. (5) That washing by decantation be adopted. (6) That the maximum temperature of drying be lowered to 100° F., as in 1867. (7) That it be enjoined to conduct the whole process as rapidly as possible, and (8) That the standard be raised to at least 60 per cent. of hydrated ferrous phosphate, $\text{Fe}_2\text{PO}_4\cdot 8\text{H}_2\text{O}$.

Mr. Dorr said they were much indebted to Mr. Coull for this interesting and elaborate paper. If he were disposed to be critical, there was one sentence that

struck him as open to remark. He did not think the analogy between the formation of oxy-salts of ferric salts and the oxidation of ferrous salts would hold good. It was not the same thing.

The next communication was on—

THE SOCIETY OF DRUGGIST-APOTHECARIES IN
EDINBURGH, 1785.

BY JAMES MACKENZIE, F.S.A. (SCOT.)

Recently there was sent to me a bookseller's sale list containing notice of a document described as "The Bond of the Society of Druggist-Apothecaries in Edinburgh," and bearing the date 1785. I have a distinct recollection that in a casual conversation about the year 1862 the late James Gardner, of 58, George Street, mentioned to me the existence of some such society in Edinburgh at an early period. I took steps to see the document, and as one of the signatories was James Gardner, the father of James Gardner, of George Street, who founded the business in 1778 in the Lawnmarket, it occurred to me that probably this was the society mentioned in 1862. It would appear that the document which has come to light so unexpectedly, and which I now produce, written and signed upon what is termed "this sheet of stamped vellum," was sold at an auction sale along with a great many other effects, and thus came into the hands of the bookseller from whom I obtained it. The document is written by John Patison, who was a well-known writer in Edinburgh at that time, and a year afterwards, in 1786, an additional clause is added by James Spence, writer, Old Bank Close, High Street. It is highly probable that, following the usual practice of those days, John Patison, and afterwards possibly James Spence, acted as Secretary to the Society, and this bond would be preserved in the office of either the one or the other and probably cleared out, many years afterwards, along with other old papers. I have made search and it does not appear ever to have been registered in the court of session as provided for in the bond, but that was a very frequent occurrence in regard to societies of this kind. I have been able to trace each of the eighteen persons who originally signed the document as well as the witnesses who attest it, and their addresses are appended.

The names and addresses of those who sign the bond (which is reproduced at page 966) are verified by the Edinburgh Directories of the period. To those of us who are members of the Pharmaceutical Society and reside in Edinburgh, this document has a special interest, proving the advanced state of pharmacy as carried on in our city, and the aims and thoughts which occupied the minds of the men who represented our calling at so early a period. For some account of the position of pharmacy in Edinburgh, I would refer you to a paper read by me at an evening meeting in Edinburgh in 1871, entitled "Pharmacy in Edinburgh in the Olden Times" (*Ph. J.* [3], vol. ii., p. 414).

In process of time the art of pharmacy was left in the hands of the druggists, a class of men who, though there was no rule, were generally those who

had served a regular apprenticeship of not less than five years. I submit a copy of the indenture usually employed, dated Perth, May 25, 1720. In this case the master was a "chyrurgeon-apothecary." In 1785 there existed in Edinburgh a class of men known as apothecaries, who I take to have been such as had been indentured to a surgeon-apothecary, paying probably a higher fee, but who did not differ from the druggist in so far as the sale of drugs was concerned. No examination was compulsory, and it was the ability to produce a completed indenture of apprenticeship which constituted the certificate of competency in those days. We have a side-light thrown on the condition of things by a description of the mode in which a diploma was obtained at the Surgeons' Hall about ten years later than this, as given in the following words: "In 1786 I applied at the Surgeons' Hall for examination in order to obtain a diploma. I was told they examined students once a month when more than one applied. Five students appeared for examination, and remained in the waiting-room till called in singly. After being questioned for about the space of ten to fourteen minutes, he was asked to retire, but immediately recalled, when he returned to his fellows to say he had been accepted."

The relative position of the druggists in 1785 is evident by the fact that they are placed first in the new Society, while the bond itself is interesting evidence of the growing desire to advance pharmacy beyond a point which had yet been thought of, and is, so far as I can discover, the first of the kind existing in our land.

It is also worthy of notice in passing that at the first meeting held in Edinburgh, along with friends from London, in 1851, to consider the formation of a Society for like purposes, which we now know as the Pharmaceutical Society of Great Britain, Mr. James Gardner was present at that meeting; he was the son of the Mr. James Gardner who signed the bond and had been apprenticed with his father at the little shop at the head of Paterson's Court, Lawnmarket, who would no doubt refer to the Society of Druggist-Apothecaries existing in Edinburgh, he being a member of this older Society; and it is a curious circumstance that the North British Branch of the Pharmaceutical Society was modelled upon the same lines; indeed, it is questionable if the Pharmaceutical Society was not shaped after this pattern, and that Mr. Jacob Bell himself discovered in this a new "northern light." For every principle of the present Society is to be found in this one, so much older, alike in its unity, training, and examination, trade interests, and regulation. The office bearers are an exact copy, and its aims identical. I am inclined to think that at the time when some of our friends in London began their reform on our North British Branch of the Pharmaceutical Society, had this document been discovered before then, some of us who had a hot hand in that fight, which has turned out so well for all parties, would have stood upon our prerogative and showed that our office-bearers were practically a continuation of an older society, and our answer to all attempts at change

would have been what Dr. Chalmers is credited with saying on another occasion, "Retract? not a hair's breadth."

It may also interest some to know that in 1774 there were about twenty druggists in Edinburgh, apart from the apothecaries and surgeon-apothecaries so general at that time in this city. These chiefly clustered round the High Street, Cowgate, and Canongate, nor need we be surprised at this, as the well-to-do citizens lived then in that locality. But great changes took place towards the close of last century, when many removed to the new town, or northern portion of the city. The very few shops in the old locality which remain may have said of them, "I alone am left to tell the tale."

It is no great stretch of imagination to suppose that these friends of pharmaceutical reform convened their meetings in the house of their friend, John Stewart, vintner, Old Fishmarket Close, which would be one of the best inns in the city at that time, and a regular place for meeting on such occasions. Indeed, such an inn retained a high reputation in this close till within recent years, when it was closed. The lawyer who drew the bond, Mr. John Patison, was a man of note in his day.

Little can be gathered now as to the druggists themselves. I find that there were some of them who took part in the public business of the city. That they were men of good position and character we have no doubt. There is still a trace of some of their business. Mr. John Moncrieff being so worthily represented in the same shop by Messrs. J. F. Macfarlan and Co.

Mr. Scott left the High Street for the South Bridge, and known long after as the firm of Scott and Orr, still represented by Messrs. Symington and Fraser. While Mr. Gardner has his name before us in the well-known firm of Gardner and Ainslie.

I find that there were others in business who, for some reason, did not join the Society. One in the Lucken Booths round St. Giles Church, named James MacCaulay, the following advertisement, cut from the *Edinburgh Advertiser*, of 1797, shows the last of his business:—

TO SURGEONS AND APOTHECARIES.

THE WHOLE MEDICINES in that Shop lately possessed by Mr. James MacCaulay, druggist, Lucken-booths, Edinburgh, together with upwards of £200 Sterling of additional articles, which have been commissioned within these few weeks, are now selling off far below prime cost, for **READY MONEY** only. Also, a considerable assortment of Glass, Shuttles, and other apparatus for Druggists and Chemists. As the whole must positively be sold off before the term of Whitsunday next, great bargains may be expected, and it is well worth the attention of any person who proposes commencing business in that line, as they may have not only the whole Medicines and Apparatus, but also a lease of the Shop.

Not to be repeated.

And now, in conclusion, I think we are warranted in saying that we are glad to have this additional light cast upon the pharmacists of our old city, who were moved by so laudable a desire to improve the whole surroundings of their daily occupation, and to raise the business of pharmacy at a time when such a task was much more difficult than in our day. I think

we may well feel proud of those men, and it is our duty to hand down their names and conduct to the generations that are to follow us.

The CHAIRMAN said they were greatly indebted to Mr. Mackenzie for his interesting account of old Edinburgh and the production of this ancient document for their inspection. He had had the privilege of reading the document carefully, and he was much struck by the prescience of these former pharmacists of Edinburgh. Some of the things they sought after were still matters for discussion, among them such as for instance the power to expel offenders from their ranks. The regulation of prices was one also with which most of them would sympathise. The idea of a fine for non-attendance at their meetings would be an excellent means of securing a large attendance. He would re-echo Mr. Mackenzie's concluding sentences. They should all feel proud of the position their forefathers occupied and endeavour to hand down to their successors the worthy traditions of which they were the heirs.

Mr. MACLAREN said it was very interesting to note how history repeated itself. By this communication he had been reminded of a meeting held in a hotel seventy-seven years afterwards in 1862, at which Mr. James MacKenzie, then of 52, North Bridge, was in the chair, and at which the Association of Assistants, known as the Wilsonian Association, was formed. Mr. MacKenzie was elected the first president on the motion of Mr. G. H. Laird, seconded by Mr. R. S. Brown, now secretary to the Grand Lodge of Freemasons, Edinburgh. Mr. MacKenzie was the first president, and he (Mr. MacLaren) was the last. On receiving notice of this meeting, he had examined some old papers and found the old minute book of the Wilsonian Association, which he had now much pleasure in handing over to the library of the Society in Edinburgh.

Mr. DOTT said he noticed a remark by Mr. MacKenzie that this Society had been incorporated. He would like to know in what way that had been done.

Mr. RUTHERFORD HILL said this was an interesting and important contribution to the history of pharmacy in this country. They had not been able to discover the sederunt book mentioned in the document, and could not tell how long this society had existed, or what kind or amount of work it had done. At the same time the significance of its formation was considerable as an indication of the state of matters in Edinburgh at that time. In 1794 a Pharmaceutical Association composed of apothecaries was formed in London for the express purpose of exterminating the druggists, whom they regarded as bitter enemies and intruders. It was not till 1802 that the apothecaries and druggists of London were able to coalesce and frame a joint petition against the oppressive proposals of the medical authorities. Evidently in Edinburgh, so early as 1785, the relationship between apothecaries and druggists was of a much happier kind, and the relative importance of the druggists was shown by the fact that the first

person who signed this document belonged to the latter class.

Mr. MACKENZIE, in reply to Mr. DOTT, said he used the word incorporated in a literary sense. There was no evidence of a legal incorporation.

(To be continued.)

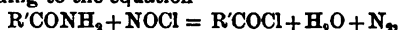
Proceedings of Societies in London.

CHEMICAL SOCIETY.

A meeting was held on Thursday, April 25, the newly elected President, A. Vernon Harcourt, F.R.S. in the chair. The following papers were read:—

THE ACTION OF NITROSYL CHLORIDE ON AMIDES.
BY PROFESSOR TILDEN, F.R.S., AND DR. M. O. FORSTER.

In continuation of their study of the reactions of nitrosyl chloride with organic bodies, the authors have investigated its reaction with amides, and find as a general rule that the reaction proceeds as follows:—the amide is converted into the corresponding acid chloride by double decomposition according to the equation—



where R' is a radical as methyl, etc. Water, however, hydrolyses acid chlorides, forming the acid and hydrogen chlorides, but if the nitrosyl chloride be used in excess, this secondary reaction does not occur. The action of this reagent on oxamide ($CO \cdot NH_2$)₂ is exceptional, since all attempts to bring about the reaction have failed, and it is suggested that this may be due to the fact that oxamide is really a closed chain compound containing pentad nitrogen according to the accompanying

formula. Prof. Sakurai (*Proc. Chem. Soc.*, 1894, 90) has recently urged the adoption of the formula next shown for glycocine (*Erlenmeyer and Sigil. Ann.*, 176, 349), thus viewing it as an internal ammonium salt with analogies to betaine.

With nitrosyl chloride, however, glycocine undergoes the general reaction, and yields chloroacetic acid, thus acting as an amide:—

$CH_2 \cdot NH_2 \cdot COOH + NOCl = CH_2 \cdot Cl \cdot COOH + H_2O + N_2$
If glycocine were a closed chain compound, as suggested above, nitrosyl chloride could only react after breaking down the ring, and it does not thus react with an analogous compound with a closed chain, viz., hippuric acid. Glycine must therefore be regarded as amido-acetic acid.

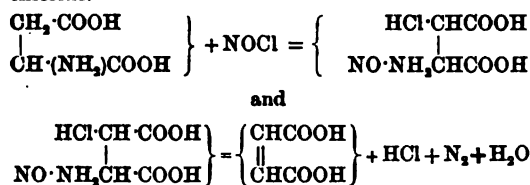
Hippuric Acid.

THE ACTION OF NITROSYL CHLORIDE ON ASPARAGINE AND ASPARTIC ACID; LEVO-ROTATORY CHLOROSUCCINIC ACID.

BY PROFESSOR TILDEN, F.R.S., AND H. J. MARSHALL.

The action of nitrosyl chloride on the amido-acid and corresponding amide of succinic acid was now investigated. If levo-rotatory asparagine ($C_4H_7 \cdot NH_2 \cdot COOH \cdot CONH_2$) is heated with liquid nitrosyl chloride, a crystalline solid is obtained (M.Pt. 172°), but a better method of preparation is to dissolve the asparagine in concentrated hydrochloric acid and pass

gaseous nitrosyl chloride through the solution, when a precipitate is formed, which after filtering off is found to be fumaric acid, and from the filtrate, chlorosuccinic acid (M.Pt. 174°) is obtained. It was found that both asparagine and aspartic acid yielded fumaric acid, and the amount formed depended on the temperature at which the reaction occurred. The fumaric acid is probably formed by the formation of an additional compound, and then splitting off of nitrogen, water, and hydrogen chloride.



The chlorosuccinic acid is formed by the general reaction, and is lævo-rotatory to a corresponding degree to the dextro-rotatory acid previously described ($[\alpha]_D = \pm 20.7^\circ$).

ON A PROPERTY OF THE NON-LUMINOUS ATMOSPHERIC COAL-GAS FLAME.

BY L. T. WRIGHT.

The ordinary non-luminous gas flame can be separated into two flames by means of the apparatus described by Smithells (*J. C. S.*, 1892, lxi., 204). In order to study the properties of the inner flame, the author uses a long combustion tube with a supply of air and gas at one end, the flame is ignited, and then the inner flame can be led down the tube by heating with a bunsen flame and moving the flame slowly along the tube, when the inner flame follows the bunsen like a needle a magnet. With the flame in this position the products of combustion of the inner flame were examined, and it was found that using a mixture of 23 per cent. of coal-gas and air that the combustion is more complete, according to the velocity of the gas supply. It was also found that the surface of the flame does not increase with the velocity, although the outer flame does so increase; the inner flame is, however, the hottest. Sometimes the inner flame begins to vibrate as the velocity of the gas supply increases, and this may start an explosive wave, thus causing fatal results.

DIORTHO-SUBSTITUTED BENZOIC ACIDS.

BY J. J. SUDBOROUGH, PH.D.

Meyer and Sudborough (*Ber.*, xxvii., 1580, 3146) have previously shown that diortho-substituted acids of the type (where R may be Br, Cl, CH₃, COOH, NO₂) do not yield esters by the general method of passing hydrogen chloride through an alcoholic solution of the acid. The esters can, however, be prepared by other general methods, as the reaction of the silver salt and alkyl iodide. The acids of the higher homologues, as C₆H₂·R·R'·CH₂·COOH (1, 2, 3), however, yield esters by treatment with hydrogen chloride in alcoholic solution. A large number of the acid chlorides, the



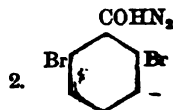
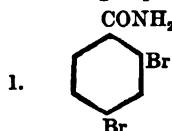
isomeric mono-, di-, tri-, and one tetra-brom-acid chlorides were prepared, and the conditions of hydrolysis studied. It was found that, as a general rule, the ortho-compounds were hydrolysed with difficulty when water was used as the hydrolysing agent, and that the meta- and para-compounds were more easily hydrolysed. When the hydrolysis was effected by pure sodium hydrate, the same result was obtained, the ortho- and particularly the dibromo-compound in the ortho position being most stable, and only hydrolysed with difficulty. Similar experiments with the dinitro-acid chlorides did not yield satisfactory results owing to other changes. Meyer states that the ortho-compounds in the mono-substituted ethers are formed more slowly than the isomeric meta- and para-compounds, and are more slowly hydrolysed.



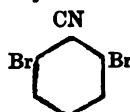
HYDROLYSIS OF AROMATIC NITRILES AND ACID AMIDES.

BY J. J. SUDBOROUGH, PH.D.

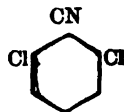
For the preparation of the acid chlorides mentioned in the preceding paper, it was necessary to first prepare the corresponding nitriles, and these were prepared by Beauveault's method, by diazotisation by Sandmeyer's method. In the preparation of these compounds two intermediate acid amides were formed, and the action of hydrolysing agents noted. Of two isomers of formula C₆H₂·Br·Br·CONH₂, it was found that hydrolysis and subsequent formation of the acid was effected by 80 per cent. sulphuric acid with the isomer (1), containing one halogen in the ortho position to the CONH₂ group, but that when they (2) were both in the ortho position to the acid amide group no hydrolysis occurred.



Two exceptions were also found of nitriles where hydrolysis was not effected by sulphuric acid, viz.:



and

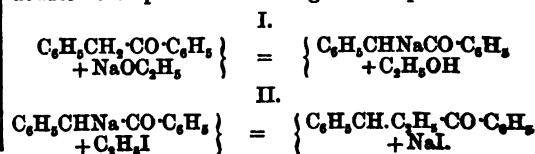


the 1, 2, 3 dibromo-benzo-nitrile, and 1, 2, 3 dichloro-benzo-nitrile.

ACTION OF SODIUM ETHYLATE ON DEOXYBENZOIN.

BY J. J. SUDBOROUGH, PH.D.

It is found that when sodium ethylate reacts with deoxybenzoin (phenyl-benzyl-ketone) a sodium compound is formed, which, with alkyl iodide, undergoes double decomposition according to the equations—



When nitro-benzene is used in place of deoxybenzoin it is found that one nitro-group in tri-nitrobenzene is easily acted on by sodium ethylate yielding an azo-compound, but no such reaction occurs with sodium methylate.

The following papers were taken as read:—"A Constituent of Persian berries," by A. G. Perkin and J. Geldard, "Potassium Nitrosulphate," by Professor Divers, F.R.S. and T. Haga. "The Milk of the Gamoose, II.," by H. Droop Richmond.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of this Association on April 25, the following paper was communicated:—

ESSENTIAL OILS IN THEIR RELATION TO THE BRITISH PHARMACOPEIA AND TRADE.

BY JOHN C. UMNEY.

(Continued from page 952.)

Coriander Oil.—No essential oil official in the British Pharmacopoeia has been more adulterated during the past two years than that of coriander. The abnormal price of the seeds during last year being to a great extent the cause of this. With a more abundant crop of seed, the quality of the oil has improved, although such change may also be attributed to the readiness with which such sophistications were detected.

The principal adulterant of the Continental distilled coriander oil has been orange oil, but in one sample examined the adulterant was found to be turpentine. These samples, bearing the label of their distillers, have been carefully preserved, and their characters are included in a table with the pure oils to show their gross adulteration.

The English and pure German samples examined showed only the slightest variations, both being readily soluble in three volumes of alcohol of 70 per cent., and possessing a specific gravity of from .870 to .885 at 15° C., these being principally the requirements of the United States Pharmacopoeia. Neither of the adulterated samples answered the former requirement, whilst the oil adulterated with orange oil examined had a specific gravity of only .864 at 15° C.

The optical rotations of the pure English and German distilled oils examined have been from +7 to +14, whilst the oils adulterated with orange oil have had much higher rotations—up to +24—and the turpentine-adulterated oil was found markedly lævo-rotatory. The characteristic viscosity of the oil is much lessened also by the two adulterations mentioned, and is sufficient in itself to cause suspicion.

The annexed table indicates the characters already alluded to, whilst it will be noted in the case of the pure oils 50 per cent. distils between 190–200° C., consisting largely of coriandrol, which boils between 194 and 198° C.

From the above it is suggested that the oil should answer the following requirements:—

Specific gravity.—.870–.885 at 15° C.

Solubility.—In three times its volume of alcohol of 70 per cent.

Rotation +6 to +14.

Not less than 45 per cent. should distil between 190 and 200° C.

Dill Oil.—This oil, which is not official in either the United States or German Pharmacopoeias, is somewhat extensively employed pharmaceutically in this country, and is in far greater demand than many of the other essential oils official in the British Pharmacopoeia.

The samples examined show very considerable variation, and in order to make accurate comparisons of them it was found necessary to distil some English fruit obtained from plants grown in Lincolnshire.

This oil was found to have a specific gravity of .9148 at 15° C., an optical rotation of +75.25, and to yield on fractionation the following percentages:—

Below 185° C.	8 per cent.
185–210	28 "
210–220	12 "
220–230	50 "
Above 230	2 "

Carvol, which boils at 224–226° C., is therefore present to the extent of 40 to 50 per cent.

These figures are very different from those obtained from a sample of German distillation, which had a specific gravity of .9002 at 15° C., an optical rotation of +70.25 in 100 Mm. tube, and yielded the following percentages on fractionation:—

Below 185° C.	26 per cent.
185–200	27 "
200–220	25 "
220–230	17 "
Above 230	5 "

It is necessary to call attention to the high percentage of low boiling terpenes in this oil and also to the small percentage of carvol contained in it, as evidenced by the small proportion boiling between 220 to 230° C. The possible abstraction of a portion of the carvol from this oil and increase in relative proportion of the other constituents has been referred to under caraway oil.

It is interesting to put on record the examination of a sample of oil of English distillation, from East Indian fruits—doubtless the product of *Poucedanum* (*Anethum*) *graveolens*—which possessed the following characters:—

Specific gravity.—.9486 at 15° C.

Optical rotation.—+47.5.

Below 185° C.	8.5 per cent.
185–210	35.0 "
210–220	7.0 "
220–230	10.5 "
230–250	17.5 "
250–280	18.0 "
Above 280	8.5 "

The proportion of carvol is therefore very small indeed, whilst the fraction boiling from 250–280° C. has a specific gravity of 1.078 at 15° C., to which the high gravity of the oil is due. Schimmel and Co. have observed the separation of a body heavier than water in the distillation of a sample of oil from these

Coriander Oils.

Description.	Rotation in tube of 100 Mm.	Sp. Gr. at 15° C.	Solubility in 70 p. c. Alcohol.	Under 190° C.	190–200° C.	Above 200° C.
1. German	+12.25	.8729	1 in 2	38 p.c.	50 p.c.	Residue 12 p.c.
2. English	+8.75	.8794	1 in 2	80.4 p.c.	53 p.c.	" 10 p.c.
3. German	-7.5	.8728	Not soluble in 1 in 30	74 p.c.	20 p.c. (190–193)	" 6 p.c.
4. German	+24.5	.8640	Not soluble in any proportion	51.7 p.c.	37 p.c.	" 11.3 p.c.

fruits. The principal constituents of the oils from English and German fruits are nearly identical and similar to those of caraway, the percentage of carvol, however, falling lower than in that oil. The aroma of this oil is somewhat modified by the presence of small quantities of other bodies, and is preferred for sweetness to that of caraway, although doubtless its carminative action is less marked, owing to the smaller proportion of carvol it contains.

It will probably be held desirable on the former account to retain this oil in a new British Pharmacopoeia, in which case the following are suggested as characters and tests.

The oil distilled from English or German fruits, specific gravity .915 to .925 at 15° C. Not more than .15 per cent. should distil below 185° C., and not less than 40 per cent. above 220° C. Dextro-rotatory to the extent of not less than +7.0 in a 100 Mm. tube.

Eucalyptus Oil.—The description of this oil contained in the B.P., 1885, viz., distilled from the fresh leaves of *E. globulus*, *E. amygdalina*, and probably other species of eucalyptus, has been the means of introducing into British pharmacy a great variety of oils differing very markedly in physical characters. This wide difference in substances answering to one generic name, "eucalyptus oil," has led to considerable difficulty in the handling of this oil, as by far the greater proportion of it is used as a convenient prophylactic against influenza, etc., by the public, who must of necessity be ignorant of the possible differences that genuine oils may possess. The oils, for medicinal use, principally met with in commerce during the past few years have been:—*Globulus* oils of Australian, Tasmanian, Spanish and French origin, and *amygdalina*, *dumosa*, *oleosa* (*oneorifolia*) and, latterly, *odora*, distilled in Australia.

Out of a great number (nearly 100) of samples examined during the past four years, only two were found to be adulterated, the substances employed being in one case petroleum and in the other camphor oil, from which the greater part of the saffrol had been removed. The specific gravities cover a wide range—the lowest being a sample of "amygdalina" oil, .8623 at 15° C., the highest being a sample of Spanish *globulus* oil .9293 at 15° C. The optical rotations vary immensely, being in a tube of 100 Mm. as much as -41.75 in the case of one "amygdalina" oil examined, whilst in the case of some "globulus" oils +17 has been the rotation observed. In the finest *globulus* oils, both French and Australian, the rotation observed has been very slight, from +1 to +4, the sample richest in eucalyptol being +1.25. The percentages of eucalyptol present vary considerably, one distilled in the month of October in the South of France, and from which no fraction had been removed, containing none, whilst the highest—a sample of "oneorifolia" oil—contained 64 per cent. The percentage of eucalyptol appears, moreover, to vary very considerably according to the time of the year at which the oil is distilled, a sample of French *globulus* oil, distilled in the spring in the same district, yielding as much as 60 per cent. These percentages are possibly somewhat lower than might be obtained by the process, which has been patented for manufacturing purposes by Faulding, and consists of the separation of the eucalyptol as phosphate; as a means for the exact assay of eucalyptol value this process has not afforded me satisfactory results. Many samples of commercial eucalyptol examined by this method have been found to contain considerable proportions of the other constituents of the natural oil.

Dr. Attfield, speaking at the evening meeting of the Pharmaceutical Society (*Ph. J.*, December 15, 1894, p. 507) on this subject observed, "Pharmacists and chemists have done even more than could

have been expected of them in connection with eucalyptus oil, they have gone ahead of the therapeutists, and the next movement ought to be made by the medical pharmacologists," and this accurately sums up the present position of our knowledge of this oil. What remains to be decided by them is therefore:—

1. Has eucalyptus oil any medicinal value as a prophylactic against "influenza" malaria, or as an antiseptic?

2. If value exists in any such direction, to what constituent of the oil is it to be attributed?

3. If attributed in the main to "eucalyptol," is it advisable to introduce that pure substance into a new edition of the British Pharmacopoeia?

Until these or similar questions are answered, it seems undesirable to suggest the inclusion in the new British Pharmacopoeia of the oil of any particular varieties or to frame any sufficiently comprehensive "characters and tests." It may be noted that in the United States Pharmacopoeia the oils of *globulus*, *oleosa* and "some other species" are official, the majority of "amygdalina" oils being excluded by the wording of the nitrite phellandren test, whilst in the German Pharmacopoeia eucalyptus oil is unofficial. It may be noted also that in the recommendations of the Victorian branch of the British Medical Association,* the "amygdalina" variety is omitted under "oleum eucalypti" and the requisition is also added that the oil "should not give the phellandren reaction."

Fennel Oil.—The two principal varieties of this oil met with in trade are known respectively as those of "bitter" and "sweet" fennel respectively. The latter commands a much higher price than the former, and is that usually employed in pharmacy.

It is official in the U.S. and German Pharmacopoeias, and although unofficial in the B.P., is in greater demand than many essential oils that find a place in that work.

The specific gravity of this oil is stated by both the United States and German Pharmacopoeias to be not less than .960 at 15° C., whilst reference is made in the former to the solidification of the oil at between 5° and 10° C., but "occasionally," is added, "it remains liquid at a considerably lower temperature."

For the purposes of this note, I have distilled a sample of oil from seeds obtained by way of Marseilles, and made careful comparison of its principal characters with those of a twice rectified sample of German distillation, the results being tabulated below. It may be noted that only the former solidifies at a temperature of 10° C. The fractionation of both samples which shows considerable discrepancy, and may be due to the German oil being distilled from any other variety of seed, appears to indicate the presence of considerable proportion of the body described as liquid anethol, (B.P. about 225 to 226° C.), although the highest fraction (230 to 235) in each case solidifies on cooling, showing also the presence of crystallisable anethol, the boiling point of which is 234° C.

Description.	sp. gr.	Optical rotation	Under 220° C.	Fractionation. 220-225	225-230	Above 230° C.
Own distillation.....	.9694	+ 16.5	11.6	16.6	63.2	8.5
German " " ..	.9767	+ 6.75	82.0	23.0	35.5	9.5

Bitter Fennel Oil.—The price of the oils met with in trade under this name affords a good indication of their value. The examination of one of these oils has been conducted, the admixture of a considerable pro-

* See *Pharmaceutical Journal*, xxv., p. 359.

portion of turpentine being evidenced by the specific gravity rotation and results obtained by fractionation.

Specific gravity.—8888 at 15° C.

Optical rotation.—-3.75.

Fractionation: Below 175° C. 76 per cent.

175-205 10.8 "

Above 205 13.2 "

The characters and tests of the U.S. Pharmacopœia appear to be those therefore of a good fennel oil, the specific gravity of not less than .960 being the most important requirement, whilst the optical rotation of the oil, viz., from +6 to +20 in a 100 Mm. tube might also be added.

Juniper Oil.—This oil, which has for many centuries been held to be of medicinal value, is one which varies considerably in character, due possibly to some extent to the condition of the berries from which it is distilled, and also to the age of the oil.

The article on "Oil of Juniper" in the series of communications on "The Turpentine of Resinous Products of the Conifers," by Dr. Julius Morel (*Ph. J.* [3], viii., 886), contains considerable information about the distillation and physical character of this oil, and shows no great discrepancy with our knowledge of its constitution at the present time.

The British Pharmacopœia adopts the views put forward by Morel, in requiring that the oil "shall be distilled from the full-grown green unripe fruit of *Juniperus communis*," which, according to that writer, yield a larger percentage of volatile oil and of lighter specific gravity. The United States and German Pharmacopœias, however, make no special requisition as to the condition of the berries for distillation, the latter giving no specific gravity, whilst the former states from .850 to .890 at 15° C.

A sample distilled over two years since from ripe berries was found to have a specific gravity of .8961 at 15° C., whilst freshly distilled oils varied between .8653 and .890 at that temperature.

The specific gravity of the oil varies according to the relative proportions of pinene and cadinene, its principal components, which have a specific gravity of .858 and .926 at 15° C., respectively, but the conditions on which the variation in proportions depend cannot be said to have been determined with certainty.

The following figures were obtained by fractionation of a freshly distilled oil from dried berries, which had a specific gravity of .8745 at 15° C.:

155-160° C. (principally pinene) ...	31.1 p. c.
160-180	14.4 "
180-210	16.6 "
210-265	12.2 "
265-280 (principally cadinene) ...	14.0 "
Above 280	11.7 "

A sample of twice rectified oil had a specific gravity of .8633, and contained 16 per cent. boiling above 265° C.

The optical rotation of this sample was -6.25, whilst that of the old sample previously referred to was -0.5.

All the oils were readily soluble in four times their volume of equal parts of alcohol 92 per cent. weight, rectified spirit and alcohol absolute.

It is questionable, therefore, whether in the new edition of the British Pharmacopœia the statement as to the condition of the berries for distillation should not be omitted, whilst the following characters and tests might be included:—

Specific gravity.—.865—890 at 15° C.

Optical rotation.—Not exceeding -10° in 100 Mm. tube.

Solubility in alcohol.—Should be soluble in four times its volume of a mixture, equal parts of rectified spirit and absolute alcohol.

Juniper Wood Oil also is largely used in this country, but although possessed to a trifling extent of the aroma of the berry oil, its use should be discoun-

tenanced. The following characters and percentages obtained on fractionation indicate that the oil shows but slight difference to oil of turpentine:—

Specific gravity.—.8645 at 15° C.

Rotation.—20.5 in a tube of 100 Mm.

155-160° C. 52 per cent.

160-170

Over 170

Lavender Oil.—It cannot be said that the investigations of Bertram and Walbaum (*Journal für praktische Chemie*, 1892, p. 590) and Semmler and Tiemann (*Berichte*, 1892, p. 1180) have led to a complete elucidation of the relation between the chemical constitution and aroma value of English and French lavender oils. These researches have led to attempts to base the value of lavender oils on the percentages of esters, viz., linalyl acetate, linalyl butyrate, and geranyl acetate, which the oils contain; it is found, however, that the results obtained by such ester determination are at complete variance with all hitherto accepted opinions of the value of the chief commercial varieties of oils so far as delicacy of aroma, and consequently, perfumery value is concerned. It seems probable, therefore, that the presence of free linalool, cineol, and possibly other bodies considerably modifies the aroma and thus renders the determination of the value, based on the ester percentage, of doubtful accuracy. There can be no question, however, as the results which follow indicate, that as a means of comparison of the purity of oils of the same class it is of considerable value, more especially as indicating the admixture of oil, from *Lavandula spicata* ("aspic" or "spike") which is most common in the cheaper grades of French oils.

English Lavender Oils.—Those examined have a specific gravity of from 885 to .900, at 15° C., and include samples distilled in the Mitcham district from the year 1884 to 1891 inclusive. Although the oils of earlier distillation possess the highest specific gravities, this change does not appear to affect the sweetness of the oil, the odorous constituents of the oil being presumably unaltered. All the samples examined dissolve readily in two to three volumes of alcohol of 70 per cent. strength, the rotations varying between -7 and -9 in a tube of 100 Mm.

The percentage of total esters contained in Mitcham oils is stated by Schimmel and Co. to be about 7 per cent., but I have found as much as 9.3 per cent. in one sample distilled at Ewell, Surrey, in 1891. By fractionation a considerable proportion of cineol was obtained from this oil. The result of an examination of this oil is included in a table showing a comparison of various types of lavender oil.

French Lavender Oils.—The specific gravity of the genuine French oils appears to vary within very narrow limits, viz., from .884-894, the finer qualities being distilled from the lavender grown at high altitudes (4000 feet) and free from admixture with oil of Lavender "aspic." The poorer qualities distilled from lavender growing at lower altitudes more often possess a higher specific gravity, due to the presence of "spike" lavender, the oil of which has a higher specific gravity than pure lavender oil, and will be subsequently referred to. The optical rotation is, moreover, affected by such admixture, for whilst the rotation of a fine quality pure French lavender oil is usually from -6 to -7.75, that of pure "spike" is from +1 to +4. Mixtures of lavender and "spike" oils therefore usually possess very slight rotatory power, sample No. 4 on appended table being probably a mixture of these oils in nearly equal proportions.

As previously mentioned the ester percentage affords an excellent means of comparing lavender oils of the

same class. As moreover, "spike" oil contains practically no esters, this determination, combined with the other physical characters already alluded to, shows almost conclusively when admixture of the two oils has been practised.

The highest percentage of ester obtained in examination of many samples of the finest French lavender oil has been that included in the table, viz., 37.1, but larger percentages, up to nearly 40 per cent., have been obtained. I cannot endorse the opinion of those who maintain, allowing their sense of smell to be biased by their chemical knowledge and determination of that which constitutes a part only of the odorous constituents of lavender oil, that the Mitcham oil "enjoys an undeservedly high reputation, and that as regards aroma it cannot compete with a fine French distillate." (Schimmel and Co., report, October, 1894.)

The ester percentage in sample No. 4, the rotation and gravity of which has already been noted as indicating a mixture of about equal parts of lavender and spike oils, is only 15.4 per cent. All of these oils dissolve readily in twice to three times their volume of 70 per cent. alcohol (by volume).

Spike (Lavandula spica) Oils are largely used in this country for veterinary purposes and in soap perfumery, and for that reason, as well as to indicate their bearing on the purity of commercial lavender oils, the results of the examination of two typical samples, one pure and the other grossly adulterated, has been appended to my note on this subject.

Lavender Oils.

Oil	Sp. gr. at 15° C.	Optical rotation in 100 Mm. tube.	Sol. in alcohol of 70 p.c. strength.	Ester percentage calculated as allyl acetate.	
English (Mitcham).	8637	-8.0	1 in 2½	9.8 p.c.	Pure
French, I., from high-altitude lavender	8896	-7.5	1 in 2	37.1 "	Pure
French, II.	8879	-6.75	1 in 2½	32.5 "	Poor quality
French, III.	9017	-1.75	1 in 2½	15.4 "	Mixed with "spike" oil
<i>"Spike" Oils.</i>					
French, I.	9052	+0.25	1 in 1½	Practically nil	Pure
French, II.	8774	-21.25	Not sol. 1 in 100	Nil	Nearly all turpentine

It will be observed that in the case of the pure oil the specific gravity is higher than that of lavender oil, whilst the optical rotation is in the opposite direction. It is readily soluble in alcohol of 70 per cent., the ester percentage being practically nil. The impure oil (No.

2) consists almost wholly of turpentine, 88 per cent. boiling below 180° C., and is, of course, far less soluble in alcohol of 70 per cent.

I would suggest, therefore, that in the case of this oil (as well as that of peppermint) the requirement "distilled in Britain" be adhered to, the following characters and tests being added:—

Specific gravity from 885–900 at 15° C.

Optical rotation.— -6 to -10.

Dissolves in three volumes of alcohol of 70 per cent. (by volume).

Mustard Oil.—The essential oil "distilled with water from black mustard seeds" is the only one contained in B.P., 1885, to which a boiling point is ascribed, viz., about 298° F. (147° 8 C.), this character being certainly the last one would of necessity adopt for examining the purity of the oil on account of the difficulty of condensing its penetrating vapour.

Two varieties of the oil are met with in trade, viz., the "natural" oil and the "synthetic" oil, the latter being at the present time about 20 to 25 per cent. lower in price than the former, although such difference varies considerably. Notwithstanding that the natural oil consists almost entirely of allyl-iso-sulphocyanate, the actual percentage of which it readily determined by the United States Pharmacopoeia process, the "synthetic" oil has not been included in that work.

A sample of natural oil examined had a specific gravity of 1.021 at 15° C., was optically inactive, and distilled entirely between 147° and 152° C. Three grammes yielded, when heated with ammonia in alcoholic solution, as detailed in the U.S. and German Pharmacopoeias, 3.247 grammes of thiosinamine (allyl-thio-urea), equivalent to 92.4 per cent. of allyl-iso-cyanate present in the original oil.

A sample of synthetic oil had a specific gravity of 1.020 at 15° C., was optically inactive, and distilled almost entirely at about 149° C., and indicated 92.9 per cent. of allyl-iso-sulphocyanate by the United States Pharmacopoeia thiosinamine process. The range of specific gravity of the British Pharmacopoeia, viz., from 1.015 to 1.020, is too narrow, that of the German Pharmacopoeia being 1.016 to 1.022, whilst this has been further extended in the United States Pharmacopoeia to 1.018 to 1.029 at 15° C. The German Pharmacopoeia requires that the first and last fractions of the oil on distillation shall correspond with the specific gravity of original oil, which test for the presence of alcohol, petroleum, etc., has been adopted by the United States Pharmacopoeia. This test and the others contained in that work might be advisedly adopted in a new British Pharmacopoeia.

Lemon Oil.—The commercial value of the two principal varieties of this oil imported into this country vary, the Palermo essence commanding a higher price by about 20 per cent. than that from Messina.

Lemon Oils.

P.	Specific Gravity at 15° C.	Fractional Distillations.						Residue.	Rotation.	Aldehyde. Per cent.	Remarks.
		Below 178° C.	173-175°C.	175-178°C.	178-185°C.	185-194°C.					
1. Palermo (1894)	8598	36 p.c.	25 p.c.	16 p.c.	8 p.c.	2 p.c.	13 p.c.	+49.5	5.2	Impure	
2. " (1893)	8588	42 "	14 "	16 "	11 "	12 "	5 "	+51.0	4.5	Pure	
3. " (1895)	8582	21 "	29.1 "	21 "	14.4 "	6 "	8.5 "	+60.0	6.8	"	
4. Messina	8572	35 "	21 "	21 "	18 "	4 "	11 "	+61.5	7.2	"	
5. Reggio	8588	25 "	25.2 "	17.6 "	18 "	6.6 "	8.4 "	+60.75	6.6	"	
6. Messina	8571	18 "	82 "	26 "	16 "	3 "	6 "	+60.5	6.6	"	
7. "	8587	20 "	28 "	14 "	17 "	9 "	12 "	+68.5	7.3	"	

Such difference does not exist on the Continent, the Messina oil being usually employed in Germany, where its principal use is for perfumery, whilst in this country the Palermo essence is preferred for the manufacture of aerated beverages, an industry which consumes by far the greater proportion of lemon oil in England.

The principal physical characters of the pure oils vary within the narrowest limits, and the determination of the specific gravity and optical rotation afford valuable preliminary tests for the purity of the oil.

The United States Pharmacopœia gives as limits of specific gravity .858 to .859 at 15° C., and optical rotation not less than 60° to the right in 100 Mm. tube, whilst the German Pharmacopœia contains no definite requirements for either of these characters.

The finest oils of trade are well within these limits, but many inferior oils, the specific gravities of which are as much as .863 at 15° C, must be regarded with suspicion, and their optical rotation usually falls considerably below +60°. It is possible, however, by a judicious mixture of turpentine and orange oils to produce an adulterant having the requisite optical rotation, viz., +60 to +63, but fractionation reveals what the polariscope is unable to disclose—the point at which the oil begins to boil being lowered by the presence of pinene, the principal constituent of turpentine, which boils under 160° C., whilst limonene, the lowest boiling constituent of the pure oil, boils at about 175° C.

An even more conclusive means for the detection of such admixture is that suggested by Schimmel and Co., which consists in a comparison of the rotations of the lower and higher boiling fractions, which should not show more than a difference of 2°.

The body to which oil of lemon owes its particular aroma is an aldehyde, citral, to which considerable attention has been called both scientifically and commercially during the past year or more, but although oils have been sold in some quarters according to their citral percentage, the process by which such value has been determined has not been published, and therefore its accuracy or otherwise cannot be commented on.

The determination of the aldehyde constituents of lemon oil by an adaptation of the method employed for the determination of cinnamic aldehyde in cassia oil, viz., by shaking the oil with strong boiling solution of bisulphite of sodium, and measuring the non-aldehyde constituents, has been found to yield useful comparative results.

It was found by this process that an oil which was stated to contain 7.26 per cent. of citral, yielded 92.75 per cent. of non-aldehydes, whilst after admixture with an equal volume of oil of turpentine, the non-aldehydic constituents were raised to 96.4. It will be noted that the oils, numbered 1 and 2 respectively, whose optical rotations and fractionation figures indicate unmistakable adulteration, yield very low aldehyde percentages.

The aldehyde separated from oil of lemon was found to possess a specific gravity .8952 at 15° C., was optically inactive, and boiled between 223° and 228°.

From the above the accuracy of the tests of the U.S.P. for a pure oil is established, and it is suggested, therefore, that the tests of that work be included in the new British Pharmacopœia with the possible addition of the requirement that not more than 30 per cent. should distil under 172° C., the rotation of such fraction not to vary more than 2° from that either of the original oil or its higher fractions.

(To be continued.)

Provincial Transactions.

LIVERPOOL CHEMISTS' ASSOCIATION.

A general meeting was held at the Royal Institution on Thursday evening, April 26, Mr. John Smith, President, in the chair. There was a good attendance.

Dr. Symes mentioned that many members of the Literary and Philosophical Society of Liverpool were desirous, in connection with the centenary of Lavoisier, of raising some memorial to that eminent scientist, but that it could not be done from the funds of their society alone, and that Dr. Nevins was willing to receive contributions to the fund which it was proposed to raise.

A resolution was proposed by Dr. Symes, and seconded by Mr. A. C. Abraham, "That an invitation be extended to the British Pharmaceutical Conference to hold their meeting in 1896 in Liverpool." The resolution was most heartily supported and adopted by the meeting, which had been convened by circular addressed to every chemist in the Liverpool and Birkenhead districts. A committee was appointed with Dr. Symes as chairman, and Messrs. T. H. Wardleworth, and H. O. Dutton as secretaries.

The following papers were then read:—

NOTE ON THE RELATIVE ALKALOIDAL VALUES OF THE LEAFLETS AND LEAF-STALKS OF JABORANDI.

BY M. CONROY.

Jaborandi as imported consists of leaflets and leaf-stalks, and as the stalks constitute no inconsiderable portion of the bulk, it was thought desirable to ascertain what alkaloidal value they possessed. Consequently, a selection of leaflets and leaf-stalks was made from the same bale for analysis. These were ground into No. 40 powder and exhausted by percolation with proof spirit containing 0.5 per cent. of hydrochloric acid. The percolates were evaporated to soft extracts. The yield of extracts, calculated as dried at 212° F., was, from the leaflets, 22.35 per cent., and from the stalks 20.3 per cent. The quantity of alkaloid was determined by taking a quantity of each of the extracts equal to 100 grains of the leaflets and stalks, and proceeding as follows:—

The extract was dissolved in half a fluid ounce of water, and well shaken up with two successive quantities of chloroform to remove chlorophyll, etc. The aqueous solution was then rendered alkaline by adding solution of sodium carbonate, and the alkaloid washed out by chloroform in the usual way. From this, the alkaloid was removed by dilute hydrochloric acid, and the chloroform treatment repeated, which gave the alkaloid in a very pure state.

The yield of alkaloid from the leaflets was 0.76 per cent., and from the stalks 0.37 per cent. From this it will be seen that the alkaloidal value of the stalks is practically one-half that of the leaflets.

In the remarks which this note elicited some interesting information was given upon the condition of jaborandi as imported, and the strength in alkaloid of different species.

NOTES ON ADULTERATED ACETIC ACID.

BY M. CONROY.

This sample of acetic acid came under my notice some time ago. It is the commercial kind known as 1·040, which should contain 29 per cent. of absolute acetic acid. Complaint was made by a user that it was weak, and that more had to be used than formerly. On examination the specific gravity was found to be exactly 1·040 at 60° F., but on titration with decinormal soda, the strength was found to be 24·5 instead of 29 per cent. From this it was evident that the specific gravity was a fictitious one, and that something had been added of a non-acid nature. On evaporating 100 grain measures, a solid white crust was left, weighing 1·87 grain, which was found to be sodium acetate. Thinking that this impurity might be accidental, a further supply was ordered from the same makers without comment.

This was some weeks afterwards, but on examination the same adulterant was found to about the same extent and the specific gravity exactly 1·040. These makers paid particular attention to the specific gravity, and I have not met with the same exactitude in the acid of other makers which was genuine. Now, seeing that commercial sodium acetate is dearer than 1·040 acetic acid, at first sight it appears strange why it should be used as an adulterant, but when we find that a solution in water containing 13·4 per cent. of commercial sodium acetate has a specific gravity of 1·040, we see at once how the thing is done. A solution of commercial sodium acetate of this strength would be worth about one-sixth the value of 1·040 acetic acid, and this sample of acetic acid contained 16 per cent. of the solution. I bring this matter forward because I have reason to believe that this sophistication is still practised and buyers are satisfied if specific gravity is correct. It will also serve as a testimonial to the ingenuity of the makers of this particular acid.

From the discussion it was evident that the unreliability of specific gravity as a test of the acid strength was well known, though it did not appear that the presence of sodium acetate had been previously noted.

NOTES FROM THE DISPENSING COUNTER UPON
SOME B.P. PREPARATIONS.

BY H. O. DUTTON.

In working with the Pharmacopœia, a point which strikes our attention is the different systems employed in writing down the recipes. In some cases we find definite quantities of all the different ingredients given, resulting in products containing nondescript quantities of active ingredients. In others [we have the finished product given in quantity by weight, and in other cases the active and principal ingredients given in definite quantities, and the solvent or diluent ordered in sufficient quantity to produce so much by measure. To my mind, as a dispenser, the last system is by far the best, and might with advantage be considerably extended so as to embrace almost all the fluid preparations. If this were done, it would be the

means of avoiding many little errors which have crept into the book.

Under most of the drugs and chemicals used we are given their strength in the different preparations into which they enter, and these figures are often confusing and require re-calculating in almost every instance when a dispenser wishes to know the proportion in a certain measure. Tables of strength to be of practical value, I think, should be given in every case in the lowest figure, that is, 1 of the drug in so many minims or grains, or fluid ounces, and ounces. The parts and fluid grains system is not a success. The book itself proves that it is very easy to make mistakes in this matter. Take page 67; under atropine it states that the ointment is 8 grains in 1 ounce, but the recipe for that ointment orders 1 ounce of benzoated lard, 8 grains atropine, and $\frac{1}{2}$ fluid drachm spirit of wine. Under sulphate of atropine it states that the liquor of that salt is 1 in 100 fluid grains, and under acetate of morphine the same strength for the liquor is given. In the former case, turning to the recipe, we have 990 minims of camphor water ordered to be used, while to make the latter only 978 minims of the three fluids are ordered, and no allowance made for the slight contraction between the spirit and water. If, as I take it, the alkaloids do not increase the bulk to anything like the extent of 10 minims or 10 fluid grains, the resulting solutions are not 1 in 100, either by weight, measure, or part.

Then, again, working from the directions for the preparation of the different recipes, in many instances they are not what we might consider models of the best method of procedure; some are unnecessarily prolix, while others leave much to the imagination. Take a class of preparations, for instance the syrups. With the exception of three or four, these all entail the solution of sugar at the time of making, and in the directions to do so we have the following rather indefinite means ordered to effect it, viz., heat, a gentle heat, and a little heat for most of them; while for syrup of tolu steam or water-bath heat, and in the case of syrup of poppies we are not even told to dissolve the sugar at all, merely to add it to the remaining liquor, after distilling off the spirit and evaporating to two pints. To make the simple preparation glycerin of carbolic acid we are given two processes, one of which is quite unnecessary.

Glycerin of Alum. — As both the potash and ammonia alums contain nearly half their weight of water, and the continued heating to effect solution drives the whole or part of this water away, according to the heat employed, the resulting solution is stronger than intended, and unless made up to weight with a sufficiency of water to allow for the loss, I have found it to be liable to crystallise out. That it may be due to this may be proved, I think, by the fact that the ammonia alum (which contains the greater proportion of water, viz., 432 in 906, against 432 in 948 in the case of the potash alum) is the more soluble in glycerin of the two salts.

Lin. camph. co. is an example of my contention in regard to inaccurate or inconsistent statements. There is no allowance made for the space occupied

by the camphor and oil of lavender, and the contraction on mixing the spirit and ammonia is not sufficient to make the liniment 54½ grains of camphor in the fluid ounce, as stated under the heading of camphor. The product is about 22 fluid ounces, using B.P. quantities.

Liquors of the Chemical Salts, Acetate and Citrate of Ammonia, etc.—These diluted solutions are principally made up to a definite measure, and where impossible, as in the case of liquor calcis saccharata, a statement of s.g. ensures accuracy. As a dispenser, using the measures at present in vogue, that is, divided into 5 minims and multiples, I think that for the diluted solution of acetate of ammonia the strength 1 in 5 is somewhat inconvenient in many dilutions. One in 4 or 1 in 6 would be much more practicable, as the concentrated solution is the best form in which to preserve it. As it is usual, I think, to dilute it down at the time of dispensing a prescription, this means taking 12 minims and multiples of 12 for every drachm, instead of, as in the case of liq. ammoniæ citrat., 15 and multiples of 15, which are marked upon our measures and are readily and accurately gauged. I cannot see any particular reason why the two solutions should not be of the same dilution.

The present form for liq. bismuthi when first introduced gave rise to considerable discussion as to its keeping qualities. I made a sample substituting 1 drachm of glycerin for 1 drachm of water per fluid oz. of the solution, and found it to keep perfectly for years, but as this would hardly have been a legal substitution, another method which I have tried is to make it of double the bismuth strength, diluting when dispensing. This answers perfectly well and I get a solution colourless and almost neutral as the Pharmacopœia orders. In passing I may state that I have found citrate of bismuth an unstable salt, becoming very acid to test paper when kept for long. Of the mixtures there is only one written in the manner usually seen upon prescriptions, viz., mist. ferri aromat., in which the peppermint water is ordered in sufficient quantity to make up to 1 pint.

In the case of mist. senna co., the intention evidently was to produce 1 pint of mixture, as under sulphate of magnesia, the B.P. says 1 in 5. In writing down the recipe, however, the fact that the salt contains nearly half its weight of water must have been forgotten, and as a definite quantity, 15 fl. ozs., of infusion is ordered to effect solution, the product is 22½ fl. ozs. about, leaving the sulphate 1 in 5½. As it is usual and proper I think to send this out bright, I think it might be ordered to be filtered. Syrup ferri iodidi is an unsatisfactory process for several reasons. One method I have found to work well, enabling me to send it out uncoloured and freshly prepared, which also can be applied to so small a quantity as 4 fl. ozs., is to make it upon the lines of the syrup ferri subchlor of the Appendix, combining 2 drachms iodine with 1 drachm iron, in the presence of 3 or 4 drachms of water, filtering this through a small cone of paper into 3½ fl. ozs. of simple syrup, and washing flask and filter with sufficient water to make up to 4 fl. ozs.

Syrup. ferri phosph. is a tedious and troublesome process; it is liable, unless carefully done, to considerable loss of phosphate in washing, and to oxidation during that process, and working in large quantities takes a deal of washing to get rid of sulphate. The solution of the phosphate for syrup would be better prepared by dissolving the metal in the acid on the plan of the Extra Pharmacopœia and B.P.O.

The hard and soft paraffins make a very satisfactory basis for ointments, much more so, in my experience, than the ung. simplicis, the latter becomes very granular after keeping, and I think that ung. hydrarg. ammoniati would be much improved if ordered to be made with these instead of with simple ointment as at present. It would be a good addition to the list of ointments if one for ung. petrolei—1 hard and 2 soft paraffin—were added. This consistency is easily worked, and for such ointments as ung. sulph. iodidi, where a softer basis is ordered, can be readily dispensed without heat by using the proportion of this containing the required quantity of hard paraffin, and diluting down with a sufficiency of soft paraffin to bring up to weight. The directions for preparing ung. chrysarobin would be improved by adopting the directions for ung. pot. sulphurata, i.e., rubbing the chrysarobin down, and adding the melted lard gradually, also a statement as to the length of time to maintain the "moderate temperature" might be given.

Among the tests for rectified spirit I would suggest that there might be added after "remains clear when diluted with water" the words, "and does not darken in colour on the addition of liquor of ammonia." I have met with samples which have done so, and I find that Squire states that it is generally considered to be due to the presence of tannin. This may not be of importance in many instances, but is fatal to the appearance of tinct. quiniæ ammoniata.

In conclusion, gentlemen, in these few notes I have endeavoured to make out that the directions for making, as a part of the B.P., are worthy our attention, and that in many instances they might be much improved, also that a system of making up to a definite quantity, more particularly in the case of fluids, might with advantage be extended to the mixtures, glycerins, etc., etc.

An interesting discussion followed the reading of this paper.

The President approved of the recommendation, that syr. ferri phos. should be made by direct action of the acid upon the iron, but found that a more stable preparation is made without heat. Mr. Conroy believed that the colour produced by ammonia in some rectified spirit is due to the German practice of coating the insides of casks with glue, which is partly dissolved by the spirit. Mr. T. F. Abraham hoped that in the next pharmacopœia the one per cent. solutions would be made one grain (weight) in 100 minims. Mr. A. C. Abraham pointed out that whatever was the intention, syr. ferri phos. of the Pharmacopœia contained both ferrous and ferric phosphate, and that a syrup prepared as Mr. Dutton approves would not have exactly the same medicinal properties.

THE SOLVENT ACTION OF PEPSIN ON ALBUMIN WITHOUT HEAT.

BY J. T. HORNBLOWER.

In determining the solvent power of pepsin I usually make four or five mixtures of water, 1 oz.; albumin, 100 grs., and acid hydrochlor., 5 min., as prescribed in the B.P., and then add pepsin in varying proportions to see the smallest quantity that will dissolve 100 grs. of albumin; not always throwing away the contents of the bottles as soon as the test was finished. I have many times noticed that a mixture containing much (perhaps $\frac{1}{4}$ or even $\frac{1}{2}$) undissolved albumin would in the course of a day or so become quite clear, showing that time, apart from temperature, was no inconsiderable factor. It then occurred to me that it might be useful to see the effect of pepsin on the albumin without heat. I accordingly made three mixtures as mentioned before, and added 2, 1 and $\frac{1}{2}$ grains of pepsin respectively; the result was complete solution in about 24, 48 and 72 hours, showing that the time taken for the solution was proportional to the quantity of pepsin present. Another sample of pepsin (using 2 grains) dissolved the albumin in about nine hours, though in each case the bulk was dissolved much sooner, as the solvent action on albumin is usually determined with a certain amount of heat. I thought it might interest some members to know (if the fact is not already known) that there is a not inconsiderable action without it; and, too, one might imagine there would not be much, seeing that pepsin in its normal condition always acts at 99° or so. The only practical deduction I can at present see to be drawn from this is, that when testing a sample of pepsin, and more especially when judging the value of different samples simply by the solvent action on albumin, that, as the action is always going on, it is absolutely essential to make any comparisons directly the allotted time for testing has expired.

Mr. Hornblower's communication produced an excellent discussion, in the course of which Mr. A. C. Abraham suggested that Mr. Hornblower should continue his investigation with the object of producing, if possible, a process for determining the solvent power of pepsin in the cold.

Correspondence.

[Letters should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.]

LIQUOR AURI ET ARSENII BROMIDI.

Sir,—An error has crept into the eighth edition of the 'Extra Pharmacopœia' on page 83, which I wish to correct. The amount of Clemens' solution, about equal to 3 grains of oxybromide of arsenium, should be 192 minims, instead of double that quantity—384 minims, as printed. The formula should thus read:—Bromide of gold, 1½ grain; oxybromide of arsenium, 3 grains (= Clemens' solution, 192 minims); distilled water to 1 ounce. Dose, 5

to 10 minims. The preparation has been recommended by Dr. E. A. Wood, of Pittsburgh, U.S.A., for various neurotic affections. The arsenical compound is given in different formulas as bromide of arsenium and oxybromide of arsenium. The former is insoluble without decomposition, and the latter is indefinite; two formulas are given for it in Watts' 'Dictionary.' Solutions of either oxybromide are generally found to be incompatible with the tribromide of gold, producing a colourless liquid with reduction to metallic gold. I have found by using Clemens' solution, which contains a definite quantity of metallic arsenium with some bromine in combination, an equivalent to the solution of two metallic salts can be prepared stable. The 'National Formulary, U.S.' has, I notice, altered the proportion of arsenic contained in Clemens' solution. This there contains about 1 per cent. of arsenious acid; the formula generally adopted in England makes it about 1 in 87½. May I ask your readers who have bought early copies of the 'Extra Pharmacopœia' to make the above correction?

W. MARTINDALE.

New Cavendish Street, W.

EARLY HISTORY OF PHOSPHORUS.

Sir,—In my possession is a curious old work on chemistry, published by Nicholas Lemery, M.D., in 1686. He refers to the "hermetick phosphorus of Balduinus" as a mixture of chalk and the acid spirits of aqua fortis, which makes it lucid. Strange he does not mention Brandt, but says, "Kunkelius, a Saxon, has written very well upon it and worked to good effect." "Daniel Kraff, a German, is the first inventor of phosphorus from urine; he gives it the consistence of a paste or liquor, as he pleases." Again, "The Honorable Mr. Boyle, of London, to whom all the ingenious have so much obligation, put forth a treatise in English three or four years ago, called 'Noctilucæ Aeriæ,' full of an abundance of experiments and most curious remarks which he has found upon this phosphorus." He speaks of the "Bolonian stone" being one of the first artificial phosphori known, but that the author, who lived in a town of the same name in Italy, was dead and left no knowledge of his secret. From his description of it, it would seem to be a sulphide, probably of barium or some such substance.

30, Trinity Street, S.E.

H. SKINNER.

THE ATOMIC THEORY.

Sir,—The two letters and foot-note in the Journal of last week convey all the information I desire, or can expect. I have fallen on evil and scientific days and am behind the age. Alas! in the rosy morning, when the laws of chemistry were imparted to me, Dalton's theory—beautiful in its simplicity, was explained in my 'Attfield' as an expedient to reason from (the relative weights of elements being absolute), and the brick-and-mortar building-up of molecules was carefully discriminated against. I prefer the old way, and will remain for the present content with my ignorance and unbelief; that is flat. Moreover, though not claiming to be wise or learned, or seeking to screen myself under the ægis of philosophy, a hard and cruel logic plays the policemen with me, in a constant 'Move on there; you can't stop here!' So, as I lack the power of imagination sadly, the only expedient I can think of is to dissolve the atom and get through it that way. I will doubtless gravitate to atoms some time, but meanwhile I do not look upon them as true grit. My obligations to both gentlemen.

Glasgow.

ALEX. LAING.

Notes and News.

STAMP COLLECTING AND DISEASE.—According to the *British Medical Journal*, it is desirable that stamp collectors should guard against the possibility of importing the germs of various inoculable diseases from their native haunts abroad. Dr. Unna has recently had under his care a case of "piedra," a disease of the hair peculiar to Columbia, South America, in which black gritty particles, consisting of the closely-packed spores of a special fungus, form on the hair shafts, and give off an objectionable acid smell. The patient had never been near Columbia, but often received letters from there, and was in the habit of detaching the stamps by soaking them in water. Probably, therefore, he communicated the disease to his beard by means of his wet fingers.

LONDON CATALOGUE OF BRITISH PLANTS.—The ninth edition of this useful book has just been published by George Bell and Sons, London, for Mr. F. J. Hanbury, and now deals with 1958 species, in addition to a large number of varieties. A detailed notice of the work will appear in the *Journal* later.

ROYAL PHOTOGRAPHIC SOCIETY.—This Society has instituted a series of "photo-mechanical" meetings on Tuesday evenings. Persons interested from a trade point of view or otherwise are invited as well as members.

INSURANCE AGAINST ACCIDENTS IN THE PHARMACY.—Some time ago in a French pharmacy, salt of sorrel was inadvertently supplied to a customer instead of seidlitz salt. As a result, the person taking it died, and the proprietor of the pharmacy was condemned to pay 500 francs as compensation, in addition to an annuity of 150 francs to each of the four orphans of the deceased, until they attain their majority. The *pharmacien*, however, was assured in the *Société mutuelle d'assurance contre les accidents en pharmacie*, and in consequence the penalty has been paid for him, and he is reimbursed all the expenses he had incurred. The Society is said to be in a prosperous condition, some two hundred persons being insured, and [it is gradually, though slowly, increasing in numbers.

EXPLOSION OF CARBON DIOXIDE CYLINDERS.—The *Scientific American* reproduces some photographs taken by a pharmacist of Lebanon, Pa., after a fire at a bottling works in that town, accompanied by the explosion of some carbonating cylinders. The first cylinder that exploded in consequence of the heat had the bottom blown out. It then passed through the side of the building and across the street into a double frame dwelling house, where it did great damage before emerging in the yard behind. Another cylinder was turned completely inside out, and blown a short distance outside the building, whilst a third one was recovered uninjured.

PUBLIC ANALYSTS IN AUSTRALIA.—The *Australasian Journal of Pharmacy* announces that the Board of

Public Health has consented to recognise as eligible for the post of analyst under the Colonial Health Act all persons who have passed the final examination of the Melbourne College of Pharmacy, and have undertaken for a further period of twelve months at the College certain courses of practical instruction, and been awarded certificates of proficiency in the subjects, including simple and complex qualitative and quantitative analysis, including qualitative and quantitative analysis of water, beverages, and foods.

THE SUMMER HOMES OF THE SEA-BIRDS.—An interesting article on this subject has been contributed to *Nature Notes* for April by Mr. W. J. C. Miller, Registrar of the General Medical Council.

ROYAL GARDENS, KEW.—The second part of the useful official guide to the museums of economic botany at Kew has now been published, and deals with the monocotyledons and cryptogams. It is sold at the Gardens at an exceedingly modest price (4d.), and will be found of great assistance to visitors who take an intelligent interest in the exhibits.

ORIGIN OF THE WORD "ARSENIC."—A correspondent of the *Academy*, dealing with this subject at considerable length, sums up by assuming that the Greeks, as early as the fifth century B.C., borrowed, perhaps from the Persian, a word to which they gave the form of *σάβδαρον*, and applied it to the red sulphuret of arsenic or realgar. Six centuries later, "Dioscorides—wishing, perhaps, to find another word for the yellow sulphuret of arsenic or orpiment (which had, possibly, up to that time been included in the term *σάβδαρον*), and finding in some other language, perhaps Arabic, a word with this meaning, viz., *zarnik* (or *azzarnik*), in which he discovered some resemblance to *ἀρσενικός* = "male" (as a form of *ἀρσενικός*)—boldly adopted this latter word, and gave it a new meaning." It is pointed out that the curious part of the matter is that, if this view is correct, *σάβδαρον* and *ἀρσενικός* would both appear to have been taken from the same Oriental word, modified somewhat, perhaps, both in form and in signification in the course of centuries, and in its passage from one Eastern language to another.

MICHIGAN STATE PHARMACEUTICAL ASSOCIATION.—The record of the proceedings of this Association at its last annual meeting, held at Detroit, Michigan, forms a handsome quarto volume of over 100 pages, which is illustrated by numerous portraits of past and present officers.

CHEMISTS' CO-OPERATIVE SOCIETY.—What the *Financial Times* refers to as "another case of wholesale centralisation," the formation of a limited liability company to purchase and run nearly eighty retail pharmacies (see p. 986), is not favourably viewed by the daily press generally, one paper remarking that there is something about the company "which is not altogether attractive," and concluding with the statement that "one cannot avoid the feeling that the venture is one which cannot be recommended as an investment that is likely to prove satisfactory."

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

WEIGHTS AND MEASURES ACT.—At a meeting, held on Tuesday last, of the Select Committee of the House of Commons (Sir H. Roscoe, Chairman) in reference to the application of the Weights and Measures Act to the trading in substances used in medicine, Mr. Charles Umney, of the firm of Wright, Layman, and Umney, wholesale druggists and manufacturing chemists, of Southwark, London, gave evidence. Referring to drugs of vegetable and chemical origin, he stated that, so far as vegetable drugs were concerned, the port of London was the market of the world almost for such imports. Most of the drugs that reached London passed into the hands of the East and West India or other dock company, and were weighed or measured by imperial weights and measures only. Notwithstanding that these drugs were disposed of at public auction and to buyers who largely represented countries in which the metric system only was in vogue, still, so far as he had learned, no objection had ever been raised to the use of imperial weights and measures in such weighing or in rendering account sales, and, in his opinion, as British trade was at no disadvantage by the continuation of these weights and measures, it was undesirable to discontinue their use.

Drugs of chemical origin were produced in England to some considerable extent (many of such being also used in the arts) but the great variety of medicinal substances were produced on the Continent of Europe, and notably in Germany. If a manufacturing chemist in England required the prompt despatch of chemicals from Germany he was generally supplied with such from stock, and in all probability weighed by metric weights; on the contrary, if he gave instructions that his chemicals should be specially weighed by imperial weights, such instructions would be as easily followed, and the authorities in Germany would offer no objection to the use of British weights. In selling drugs in England avoirdupois weight was used, in dispensing medicines troy weight was used, but in exporting medicines to some parts of the world, notably Spanish South America, it was required that orders should be filled by metric weights and measures only. As far as he (Mr. Umney) understood the present Weights and Measures Act, metric weights could only be kept in a laboratory for scientific purposes, or in a warehouse for checking the accuracy of the weight of goods imported, and so soon as the metric weights were used for weighing goods passing outwards, the use of such weights was illegal. This, he thought, was most objectionable, and a great hindrance to export trade. As hon. sec. of a club representing the leading wholesale druggists of England, he had in his hand letters showing that his *confères*, both in London and Liverpool, view the working of the present Weights and Measures Act, if strictly enforced, as a great impediment in the conduct of their export business.

As a member of a committee recently appointed by the Pharmaceutical Society of Great Britain to aid the General Medical Council in the production of an Imperial Pharmacopœia, Mr. Umney also stated that in his opinion, if a revised Pharmacopœia was to be possessed of that intercolonial and international character that ought to be an essential of such a work, the metric system of weights and measures was an absolute necessity in its issue, and in adopting such a system for setting out the formulæ by which medi-

cines were to be compounded they would only be following every European nation (including Russia) and also the United States of America, Japan, etc. Mr. Umney further gave it as his opinion that a pharmacist of any nationality could with a prescription before him in metric weights and measures decipher it not only with mental ease, but with greater safety to the public than if the weights and measures of the prescription were indicated by the British system. He thought the adoption of the system for general trade purposes (other than medicines) must necessarily be gradual, but that with the better education of the rising generation in the simplicity and advantages of the system a more speedy adoption would come about.

CHEMISTS' CO-OPERATIVE SOCIETY.—The *Financial Times* refers to another case of wholesale centralisation which is now before the public. The Chemists' Co-operative Society, Limited, proposes to take over no less than seventy-six selected businesses of chemists and druggists and to run them from one centre on the co-operative principle, and has entered into a contract under which it is to acquire immediately forty businesses as going concerns. Of the seventy-six concerns, twenty-five will be in London, and fifty-one in the provinces, "so that the enterprise," remarks our contemporary, "will certainly be spread wide enough to come in for extensive patronage from the public if well managed. Besides, it is proposed to gradually acquire other shops as opportunity offers, and to open various fresh establishments and a laboratory and warehouse." It would seem that the *Financial Times* young man has had at one time or another to pay more than he thought enough for his humble seidlitz powder or ounce of salts, for he continues in a pathetic vein: "If the Chemists' Co-operative Society enables the public to get good drugs and medicines below the present exorbitant charges, it will not have lived in vain."

CO-OPERATIVE CHEMISTS.—There is something about the Chemists' Co-operative Society, Limited, which is not altogether attractive. The buying up of a larger number of retail establishments with the idea that they can be worked very cheaply under one management and thereby be made to yield a handsome profit on very big purchase prices, is an old one. It has often been attempted. Has it ever succeeded? We can confess that at the moment we cannot call to mind a single instance in which it has. The notorious Bread Union was a device of the kind, and we know what came of it. The profit estimates in this Chemists' Company are very loose and unsatisfactory. A number of establishments are to be purchased which have been making for their proprietors an average profit of £300 a year each. Are they likely to be worked by a manager for much less in the future? If not, where will the profit come from? The accountant's certificate says that it was not the practice at these shops to take stock! Consequently the profit statement must be largely one of estimate. Altogether one cannot avoid the feeling that the venture is one which cannot be recommended as an investment that is likely to prove satisfactory.—*Sun*.

THE CHEMISTS' CO-OPERATIVE SOCIETY, LIMITED.—With a capital of £200,000 this company has been formed to carry on the business of wholesale, retail, manufacturing, and export chemists and druggists. The capital is £200,000, divided into £100,000 Seven per Cent. Cumulative Preference shares of £1 each and £100,000 ordinary shares of £1 each. For the life of me I cannot see what inducement is held out to investors to place their money into a concern like

this. From the prospectus it appears that the company will immediately acquire forty establishments of chemists and druggists, all going concerns. Well may it be said the businesses are going—at a good price—so good that I should advise my readers to wait for something else.—*Truth*.

AN ALLEGED BOGUS DRUG COMPANY.—At the Exeter Bankruptcy Court on Saturday, April 27, before the Official Receiver (Mr. T. Andrew), the first meeting of the creditors of William Dale Bayliss, of 50, Union Street, Torquay, chemist and druggist, trading under the style, firm, or company of the "Bayliss Drug Company, Limited," was held.—Debtor, whose statement of affairs showed assets amounting to £217 10s. 10d., liabilities, £947 16s. 3d., and deficiency £729 17s. 5d., attributed his failure to over-stocking and pressure by creditors, and further says: "On February 26, 27, and 28 last the Sheriff held a sale of a portion of the stock-in-trade at the suit of Sanger and Sons for a debt of £192 and costs. The sale realised (including £4 taken from the till) £240 or thereabouts. This sum is still in the hands of the Sheriff, but as an issue is now before the court, I do not carry same out as an asset, neither do I schedule Sanger and Sons' debt as a liability."—The Official Receiver's observations were as follows: In December, 1893, the Bayliss Drug Company, Limited, was formed, consisting of the debtor and six other members of his family. In February, 1895, Messrs. Sanger and Sons obtained judgment against this company, and the Sheriff levied and sold for £192 and costs. A provisional order under the Companies Act was made, but not in time to dispossess the Sheriff, whereupon certain creditors filed a petition in bankruptcy against Bayliss individually, alleging that the Bayliss Drug Company was a bogus affair, although duly registered. An *interim* receiving order was made, and the Official Receiver claimed the proceeds of the sale in the hands of the Sheriff. The Sheriff thereupon interpleaded, and the Master directed an issue to be tried by jury, the question being whether these proceeds belonged to the Bayliss Drug Company or to the debtor Bayliss personally. The County Court judge holds that the company was a bogus affair, and for the benefit of Bayliss only, and made a receiving order accordingly. But what the result of this action may be it is impossible to say, and more especially because the question raised is unique. The sum which the debtor says he invested in this business was £500 in cash and three bills of exchange for £100 each. The books of account purported to be the books of the company." The usual order was made.

ROYAL SOCIETY SOIRÉE.—The first soirée of the Royal Society was held at Burlington House on May 1, a month earlier than usual, and the exhibits were as numerous and interesting as on any previous occasions. There was an electrical furnace, used for the melting of such obstinate metals as chromium, titanium, and platinum, some of which require a heat of from 2500 to 3000 degrees centigrade. Professor Roberts-Austen explained that the furnace consisted of a fire-clay case lined with magnesia, and contained a magnesia crucible. Messrs. Johnson, Matthey, and Co. exhibited specimens of the six metals which compose the platinum group, a platinum nugget of 158 oz. and a palladium ingot of 1000 ozs. being the largest ever produced. There were also a rhodium ingot, osmium melted and sponge, ruthenium melted by the electric arc, and a pure iridium rolled sheet. Professor Ramsay showed spectra of argon extracted from air,

and a mixture of argon and helium extracted from cleveite. Mr. Norman Lockyer showed a photographic spectrum of Orion, taken with a six-inch telescope, and enlarged twelve times.

Mr. W. N. Shaw showed by means of glass globes and an apparatus which produced a mixture of two currents of air at different temperatures, how clouds could be formed with a whirling movement analogous to a cyclone. In another globe the formation of cloud of the quiet fog type was effected by a sudden expansion of air, causing depression of temperature equivalent to an elevation of 10,000 feet. A mechanical device for correcting temperature was shown by Dr. John Shields, and Dr. J. Norman Collie introduced a new and simple form of barometer, in which a minimum of mercury is used. It can be stored away in a drawer on its side or upside down without risk, is extremely accurate, and does not easily get out of order. Sir B. W. Richardson's electrical cabinet embodies a light with reflector for illuminating the throat, an electric cautery, etc., etc. It can be moved from bed to bed as required, and the current may be supplied from the main by which most large hospitals are now lighted. Mr. R. E. Crompton showed the latest form of his "potentiometer" and simple forms of platinum thermometers for use with it. Professors W. M. Hicks and J. A. Fleming also exhibited instruments, Dr. Hopkinson a large electro-magnet, Professor Ewing a magnetic tester, Major Holden, R.A., an optical electric meter, and Major Carden, R.E., specimens of the deposit or incrustation on the insulators of the electric light mains at St. Pancras, in which metallic sodium and potassium were found.

In natural history a number of interesting objects were exhibited. Some spotted potato slices in glass cases, arranged by Mr. W. T. Burgess, impressed visitors with the constant risks to which they are exposed by flies carrying infection. House-flies were shown walking over slices of sterilised potatoes, and in other cases the disagreeable results of their wanderings were represented by colonies of microbes. Professor V. B. Lewes exhibited acetylene for illuminating purposes; Dr. Gustav Mann, microscopic specimens of nerve cells; and Mr. R. E. Crompton, apparatus showing the application of electricity to trade and domestic purposes. On the ground floor, also Lord Armstrong illustrated the results of recent experiments on the electric discharge also, the demonstrations being made by means of a powerful electric lantern and a number of beautiful slides.

INFLUENCES OF TRADES ON FACES.—A curious paper, remarks the *Daily Telegraph*, is contributed to the new number of "Blackwood's," by Dr. Louis Robinson on the influence of trades on faces. It is pretty generally agreed that association with horses gives a person a horsey look; but it appears that circus-riders and ring-masters are exempt from the general rule, because with them the horses are regarded as mere "properties," and their minds are occupied solely with the achievement of certain feats to the satisfaction of the public. Dr. Robinson takes as types professional musicians, priests, actors, actresses, and blacksmiths, and shows how their pursuits induce strongly-marked facial expression. Even the style of hair which has become associated with musicians is not altogether dependent on fashion, but is evidence of trophic changes resulting from mental habits. The growth and vitality of the hair are profoundly influenced by emotions. Priests cannot change their priestly countenance if they wished. For some mysterious reason the subcutaneous tissue over the cheekbones and under the jaws of the cleric's face gets an undue supply of nourishment, which leaves distinctive marks, while

the consciousness of a share in the Apostolic legacy gives a muscular set to the lips. Dr. Robinson goes on to discuss the other classes mentioned in the same strain, and he ends by saying that the aim of the paper is to aid those who are endeavouring to place physiognomy on a sound basis. The task is a difficult one, because in the course of the article he admits that not only may the organic part of a man show every sign of guilt when there is no guilt, but only temptation; but it may even go further, in attaching a slanderous libel to the countenance, owing to the interlocking mechanism of emotion, passion, and nutrition.

LEICESTER BACTERIOLOGICAL INSTITUTE.—According to the prospectus of this Institute, it has been formed with a view to provide medical men in the Midlands an opportunity for carrying on original research in connection with the etiology of disease. A laboratory has been provided and fitted up by Messrs. John Richardson and Co., Leicester, Limited, and placed under the control of a council, appointed by the Leicester Medical Society. The objects for which this Institution is established are:—

1. To investigate the means for preventing and curing the various infectious and other diseases, and to provide a place where original research work may be carried on for this purpose.
2. To provide instruction to medical men and advanced students in bacteriology.
3. For the diagnosis of disease by means of Bacteriological and other processes.
4. To prepare, supply, and test any protective or curative material.

The important part now played in the etiology of infectious diseases by micro-organisms renders it necessary that the busy medical man should be kept in touch with the advancement of this comparatively new development in scientific medicine, and it is partly for this reason that this Institute has been founded, with the hope that help in this direction may be given to those seeking it, the terms of which are herein set forth. The isolation of the special micro-organism in certain infectious diseases has greatly advanced our knowledge, and has led to a new and more satisfactory method of treatment. The diseases of cholera, typhoid fever, diphtheria, anthrax, rabies, pleuropneumonia, tubercle, and the antiseptic treatment of wounds are amongst those which have lately been investigated, with the result that many hitherto obscure points have been cleared up.

The laboratory has been licensed under Act 33-40, Vic. Ch. 77, and for the use of the laboratory, microscopes, reagents, etc., apparatus, incubators, and all necessary material, subject to the control of the director, a fee of £7 7s. per annum will be charged. Any properly qualified person can make special arrangements with the Director for work extending over shorter periods; classes will be held, consisting of a course of lectures during the winter session; and the staff of the laboratory undertakes bacteriological and microscopical examinations of discharges or morbid growths. Further information may be obtained of the Director, J. Andrew Turner, M.B., D.P.H., Camb., Bacteriological Laboratory, Stanley Road, Leicester.

METHYL SALICYLATE has been found in *Gaultheria procumbens*, L.; *G. punctata*, Blume; *G. leucocarpa* Blume; *G. leichenaultii*, D.C.; *Betula lenta*, Willd.; *Polygala senega*, L.; *P. alba*; *P. vulgaris*; *P. depressa*, Wender; *P. calcarea*, F. Schulz; *Monotropa hypopitys*; *Laurus benzoin*; *Spiraea ulmaria*, L.

Polsoning Cases and Inquests.

Sulphuric Acid.—George Cole, aged 64, died on Wednesday, April 17, in the Southern Hospital, Liverpool, from the effects of sulphuric acid, self-administered. Verdict: "Suicide whilst temporarily insane."

Laudanum.—James Shepherd, aged 67, died on Sunday, April 21, at 6, Derby Row, Newton-le-Willows, from the effects of laudanum, self-administered. Verdict: "Suicide whilst temporarily insane."

Mercury.—Joseph Williams, aged 57, died on Thursday, April 13, at Herbert Cottage, Llanwarne, from the effects of mercury, self-administered. Verdict: "Suicide whilst of unsound mind."

Laudanum.—David Bryon Cole, aged 25, died on Tuesday, April 23, at Charlotte Street, Fitzroy Square, London, from the effects of laudanum, self-administered. Verdict: "Suicide whilst of unsound mind."

Strychnine.—At the inquest held on the body of Robert Pollitt Rawsthorne (see *ante*, p. 957), on Friday, April 19, Dr. G. Patrick said he had made a post-mortem examination of the body, and had found there were all the symptoms of strychnine poisoning. The coroner observed that the sooner the law with regard to the sale of poisons was altered the better, and said he had often had to complain of the many facilities open for getting poison, as if a man was wishful of putting himself out of the way he could easily do it. Verdict: "Death was due to strychnine poisoning, the deceased suffering from temporary insanity at the time."

Laudanum.—Catherine Sinclair or Sim, aged 40, died on Tuesday, April 23, at 61, Dale Street, Glasgow, from the effects of laudanum, self-administered.

Oxalic Acid.—A lance-corporal in the 2nd Scots Guards, named Macdonald, died on Thursday, April 25, at the Chelsea Barracks from the effects of oxalic acid, self-administered.

Prussic Acid.—William Hudson, aged 56, died on Wednesday, April 24, at 184, George Street, Glasgow, from the effects of prussic acid, self-administered.

Laudanum.—Ellen Price, aged 30, died on Wednesday, April 24, at Northenden, from the effects of laudanum, self-administered. Verdict: "Suicide whilst in a state of unsound mind."

Oxalic Acid.—Frank Sanders, aged 26, died on Friday, April 26, at 26, New Street, Exmouth, from the effects of oxalic acid.

Carbolic Acid.—William Webb, aged 47, died on London Fields on Thursday, April 25, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Laudanum.—William George Chandler, aged 41, died on Sunday, April 28, at Whetstone, near Leicester, from the effects of laudanum, self-administered. Verdict: "Suicide during temporary insanity."

Sulphuric Acid.—Annie Mayle Cottrel, aged 2 years, died at Douglas, from the effects of sulphuric acid. At the inquest held on Tuesday, April 30, a verdict of 'Accidentally poisoned' was returned.

Patent Office Business.

APPLICATIONS FOR PATENTS.*

- No. 7633.—Pneumatic truss for rupture belt. April 17, 1895.
 No. 7695.—Improvements in and connected with the sterilisation and preservation of milk, cream, and other fluids. April 17, 1895.
 No. 7706.—Improvements in the treatment of cod-liver oil. April 17, 1895.
 No. 7710.—Preserving perishable articles. April 17, 1895.
 No. 7741.—Improvements in closing devices for bottles. April 18, 1895.
 No. 7776.—A new or improved nasal respirator or inhaler. April 18, 1895.
 No. 7780.—Improvements in or appertaining to devices for drawing corks, compressible stoppers, or the like. April 18, 1895.
 No. 7837.—An improved apparatus for electrically heating liquids. April 19, 1895.

PATENTS PUBLISHED APRIL 20.

Vanillin (Abel, C. D., communicated from Haarmann and Reimer).—The inventors slowly add iso-eugenol to a cold solution of sodium peroxide, and warm the mixture until the "iso-eugenol-sodium" at first separated has dissolved, and the action by which the iso-eugenol is oxidised to vanillin has finished. From the solution the vanillin is separated and purified as usual. The oxidation might be effected by means of peroxide of hydrogen, manganese, barium, or lead. The iso-eugenol may be prepared by heating eugenol with a strong solution of an alkaline hydrate, as described in the specification No. 17,547 (1890) of De Laire. No. 11,952 of 1894.

Trusses (Strauss, A.).—Relates to trusses for exomphalus or umbilical hernia or other ruptures, and consists in using a pad which fits within the "gate" of the rupture, but is not actually attached to the belt which secures it in place. For this purpose the pad is carried by an india-rubber or other disc backed with a woollen fabric, and bearing on, but not attached to, a smooth plate forming the front of the belt. The latter thus holds the pad in position, but adjusts itself to the movements of the body. No. 12,089 of 1894.

Milk product (Wetter, J., communicated from Hentschel, L.).—Comprises the production from cream, of a semi-solid food containing all the fat, albumin, casein, and sugar of the cream. In preparing it cream is beaten up into a froth and heated by a current of dry air until sufficiently dry to be kneaded into shape for sale. The product has the taste and odour of milk, shows no fatty globules under the microscope, is capable of forming a milky emulsion with water, and does not melt at the temperature of boiling water. No. 146 of 1895.

Dental Clamps (Richter, R.).—Relates to the securing of the wads which are employed for keeping teeth dry during the operation of filling, and consists in fitting the clamps now in use, with platinum or other wire bows or hooks, and bent, pointed wire shanks which pierce and hold the wads. No. 2141 of 1895.

Tooth brushes (Thompson, W. P., communicated from Brock, J.).—The portion carrying the bristles is arranged crossways at one end of the handle to permit of readily cleansing the teeth both vertically and horizontally, and a small "round arched" brush is formed at the other end of the handle for cleansing the backs of the teeth. No. 4865 of 1895.

BITTER ALMOND OIL oxidises, with formation of benzoic acid, unless it be kept in full bottles or have 10 per cent. of alcohol added to it, according to Schimmel and Co.

HOUSEHOLD OR CLOUDY AMMONIA is made by dissolving ammonium oleate in liquid ammonia. The process is patented and the name is copyright.

Technical Notes.

SOLUBILITY OF SULPHATE OF LEAD.—Messrs. Gladstone and Hibbert found that sulphate of lead is about equally insoluble in dilute sulphuric acid, and in dilute acid mixed with sodium sulphate. This conclusion is confirmed by the following note of an experiment by Mr. P. W. Burman:—"Dissolved a small quantity of litharge in a warm, strong solution of caustic soda, which was allowed to cool and then filtered. This clear solution was then exactly neutralised with dilute sulphuric acid, phenolphthalein being used as the indicator. This solution, together with the precipitated lead sulphate, was divided into two portions, which were set aside for the precipitate to partly settle. One portion was repeatedly filtered, a portion of the filtrate being each time tested with SH_2 , when on each occasion it gave a distinct brown coloration. The other portion was acidified with sulphuric acid till it contained about 10 per cent. of free acid, and was then subjected to the same treatment of filtration and testing with SH_2 , with the result that the brown coloration was even more marked than before, and was constant in depth after each filtration." It is known that sulphate of lead is not absolutely insoluble, even in pure water.—*Electrical Review*.

FERRICYANIDE OF POTASSIUM AS AN OXIDANT.—Experiments are being made with a view to utilise this oxidant in electro-chemistry. It is not at first sight obvious how this substance, which contains no oxygen, can act as a powerful oxidant; nor is the matter made quite clear when it is pointed out that free alkali must be present to render its oxidising power available. The explanation is that ferricyanide of potassium has a great tendency to become ferrocyanide by appropriating additional atoms of the alkaline metal contained in caustic potash, water and free oxygen being liberated.—*Electrical Review*.

SACCHARIN IN BEER.—Saccharin gives a distinct fluorescence when solutions containing it are treated with sulphuric acid in the presence of resorcin, and this reaction serves as an excellent test for the substance. It is found by Gaultier, however (*Zeit. für anal. Chem.*), that a similar result is obtained with the resin of hops, so that for the detection of saccharin in beer, it is necessary to evaporate the liquid to a syrupy consistence, acidulate with a few drops of hydrochloric acid, and add alcohol of 94° to precipitate dextrins, then decant the alcoholic solution, evaporate again to a syrupy consistence, and agitate with ether. The ethereal extract obtained on evaporation, which contains the resin of hops and any saccharin present, is treated with boiling water which dissolves the latter only, and the residue left on evaporation is then easily detected by its characteristic sweetness.

NOVEL ANTISEPTICS.—Several of our most powerful and popular antiseptics, e.g., carbolic acid and nitrate of silver, lose part of their effect when admixed with substances containing albuminoids, because they coagulate the albumin and are precipitated with them. The result is that we have to apply an excess of the antiseptic, which means waste, and which may be objectionable in so far as such more concentrated solutions may prove corrosive or toxic. Under these circumstances a discovery made by the *Chemische Fabrik auf Aktien*, late E. Schering, Berlin, has a wider interest. There are certain organic bases, in themselves poisonous to the lower organisms, which, when combined with these antiseptics, prevent coagulation of the albumin, and, moreover, render the agent more effective. These bases, ethylenediamine and its derivatives, contain compounds

* From the *Illustrated Official Journal (Patents)*.

derived from the chlorohydrines, etc., are all highly alkaline, and capable of dissolving the membranes of some bacilli, hence their increased efficiency. The mode of preparation is simple. About 10 lb. of the base are dissolved in 500 lb. of water, and the antiseptic, freshly distilled cresol, for instance, gradually added. Creosote and other antiseptics require a little more of the base. To prepare the silver compounds, we proceed in a similar way, starting from phosphate or nitrate of silver, or other organic silver salts, or even the chloride of silver. These novel silver compounds dissolve mucus, and may be diluted according to requirements; they are thus very convenient for use. Among the antiseptics which may be treated in this manner are carbolic acid, cresol, thymol, naphthol, guaiacol, creosote, etc.—*Engineering*.

Photographic Notes.

Colouring Photographs.—Hector Kraus thus describes a process recently patented in Germany. The pictures are coloured from the back. The colouring permits the finest details, in regard to light and shade, while the brilliancy of the colours and the effects produced perfectly harmonise with the general tone of the photograph itself. The colours employed for this purpose are aniline colours, which are dissolved in water or alcohol, and the solution, which can be made either warm or cold, must be as concentrated as possible. Numerous experiments have shown that certain aniline colours, dissolved in water or pure alcohol, give the desired results, while other colours require a solution, in a mixture of alcohol and acetic acid, in order to be utilised for this purpose. The number of aniline colours which can be produced in this manner is, of course, unlimited. Those colours dissolved in alcohol, or in a mixture of alcohol and acetic acid, must be kept in well-stoppered bottles, so that they keep as long as possible the capacity of penetrating into the paper or other material. In order to use the prepared colours they must be diluted with a medium, consisting of pure alcohol, or alcohol mixed with acetic acid. This medium makes it possible for the artist to weaken the different colours more or less, and thus to produce darker or lighter tints, besides, it increases the penetrating capacity of the colours. The photographs, no matter on what paper or by what process they are made, are coloured before they are mounted, without undergoing any previous preparations. It is only necessary that the print is flat, without creases or other defects. The print is placed on a retouching frame, or a similar apparatus, on which it can be seen by transmitted light, then the colours are applied with the brush, on the back of the print, and diluted with a certain quantity of the medium. It is only necessary to keep exactly the contours, or different outlines of the pictures. The colours possess an extraordinary penetrating capacity, and enter at once into the paper, for which they possess a great affinity. It is, therefore, very easy to control the progress of the work, and to apply the colours within the limits where they are necessary. The liquids which have served for the preparing of the colours evaporate very quickly, and only the colouring matter itself remains in the paper. By turning over the print it can be observed how the colours appear on the front, and it is possible to exactly judge the effect produced by the colours, and, if necessary, to strengthen them by the application of further tints. After the picture is coloured to satisfaction it can be mounted and burnished like any other photograph; small high lights and finishing touches, such as jewellery or other small details, can afterwards be applied with ordinary body colours on the front side of the picture.—*Photographisches Archiv*, through *Photography*.

New Remedies.

[The notes given under this heading for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

PHENOL, CHLORAL AND IODINE IN ALOPECIA ARATA.—Rub in once a week until marked dermatitis appears a mixture of equal parts of carbolic acid, chloral hydrate, and tincture of iodine (*Therapeut. Monats.*)

FERRIPYRIN AS A STYPTIC.—Dr. Witkowsky describes ferripyrin as a powerfully astringent styptic, but free from any irritant action on the skin or nasal mucus membrane. Pledgets of wool saturated with an 8 to 20 per cent. solution are applied to the bleeding surfaces, or it may also be used as a snuff or powder. For injections in gonorrhoea a solution of 1 to 1½ per cent may be used (*Therapeut. Monats.*).

STRYCHNINE IN SNAKE BITE.—The fallacy of the employment of strychnine as an antidote to snake-poisoning has been fully established in India by Surgeon-Lieutenant Elliot, who reported the results of his experiments before the South Indian Branch of the British Medical Association. He and all those who spoke at the discussion of the paper agreed that strychnine was calculated to be extremely dangerous, and only to add further agony to the unfortunate patient without affording any relief (*B. M. J.*, April 20, 1895).

OXYGEN IN TREATMENT OF WOUNDS.—Dr. G. Stoker gave a demonstration of some remarkable results that he has obtained by treating suppurating wounds, ulcers, lupous and tuberculous sores, by surrounding them with an atmosphere of pure oxygen, by means of rubber bags. Not only does the oxygen appear to cause rapid healing of old-established wounds and sores, but it almost immediately alleviates pain (*Med. Press*, April, 1895).

COMPOUND SULPHUR DRESSING FOR WOUNDS.—The following is an excellent substitute for iodoform for dressing wounds: Camphor in powder, 1 part; sub-nitrate of bismuth, 1 part; sulphur, 6 parts (*Mod. Med.*, January, 1895).

HYDROCHLORATE OF PHENOCOIL IN MALARIA.—Dr. Ribet reports very favourably of the employment of phenocoll hydrochlorate in malarial fevers. It may be given either in cachets or, preferably, in solution in a little sweetened water. The daily dose for an adult is 2 grammes, for a child, ½ gramme, which should be given in fractions five hours at the most or at least three hours before the expected febrile attack (*Revue de Thérapeutique*, February 1, 1895).

BROMETHYL-FORMINE IN EPILEPSY.—Bromethyl-formine is given to epileptic adults in cachets, in doses of 1 gramme which may be repeated two to eight times a day without producing bromism. For children the following mixture is preferable:—Bromethyl-formine, 10 parts dissolved in water 10 parts, then add syrup of orange 90 parts (*Les Nouveaux Remèdes*).

OX-BILE IN TYPHOID.—Summa finds ox-bile to be a physiological antiseptic, also an antipyretic, exercising a tonic action on the heart, diminishing the pulse rate, but increasing their strength and raising the blood-pressure. It also increases the peristaltic action of the bowels. The author has treated beneficially twenty-five cases of typhoid with this remedy (*Saint Louis Med. and Surg. Journ.*).

OIL OF PEPPERMINT IN THE TREATMENT OF PHTHISIS.—Carasso recommends the use of oil of peppermint in pulmonary tuberculosis, both by means of inhalations and by internal administration of the oil combined with creosote. He states that thirty-seven cures were effected in forty-four cases. The regimen consists in the persistent inhalation, day and night, of the vapour of the oil by means of a respirator composed of a fold of lint, which is moistened every three or four hours with 4 or 5 drops of peppermint oil. During the day a tablespoonful of the following mixture is taken every three hours:—Pure beech-wood creosote, 8 parts; rectified spirit, 500 parts; glycerin, 250 parts; chloroform, 20 parts; oil of peppermint, 8 parts. Shake before use (*Il Faro Med.*, after *Revue de Thérapeutique*).

CITRIC ACID IN URETHRITIS.—Dr. Perlessier employs injections of citric acid in one per cent. solution, and also washes the urethra with a more dilute solution of 8 parts in a 1000 or 1500 parts of water by injecting 1500 grammes directly into the bladder. The former method of urethral injection is repeated six times daily, and the cure is completed about the tenth day. The method of washing is practised once daily and the cure takes place in four or five days (*Rev. Internat. de Méd.*, after *Rev. de Thérap.*, February 1).

ZINC IN CHOREA.—Morain orders zinc oxide in the form of pills combined thus:—Oxide of zinc, 1 gramme; extract of belladonna, 20 centigrammes; castor, 2 grammes; asafoetida and extract of valerian of each 4 grammes. Mass and divide into sixty pills. From two to four to be taken in the course of the day. Valerianate of zinc he gives thus:—Valerianate of zinc, extract of hyoscyamus, subnitrate of bismuth, of each 5 grammes. Mass and divide into thirty pills, of which from three to six are to be taken daily (*Revue Inter. de Méd. et de Chir. Prat.*, April 10, 1895).

Trade Marks Applied For.*

No. 185,976.—CHEMICAL SUBSTANCES used in manufactures, photography, or philosophical research, and anti-corrosives, but not including caustic soda, and not including any goods of a like kind to caustic soda.—Colthurst and Harding, 11, Queen Victoria Street, London. March 5, 1895. Words: "Stormy petrel," and device of same.

No. 185,666.—CHEMICAL SUBSTANCES used for agricultural, horticultural, veterinary, and sanitary purposes.—Richard Walmsley Harrison, 48, 50, and 52, Darwen Street, Blackburn. February 15, 1895. Word: "Hoixioh."

No. 185,667.—CHEMICAL SUBSTANCES used for agricultural, horticultural, veterinary, and sanitary purposes.—Richard Walmsley Harrison, 48, 50, and 52, Darwen Street, Blackburn. February 15, 1895. Word: "Nixin."

No. 185,668.—CHEMICAL SUBSTANCES used for agricultural, horticultural, veterinary, and sanitary purposes.—Richard Walmsley Harrison, 48, 50, and 52, Darwen Street, Blackburn. February 15, 1895. Word: "Sixis."

No. 186,138.—CHEMICAL SUBSTANCES prepared for use in medicine and pharmacy.—Cressel John Portway and Lewis Robert Portway, 1, Cargreen Road, South Norwood, London, S.E. March 12, 1895. Word: "Sanjana."

No. 185,933.—LINED AND OTHER OILS included in Class 4, and turpentine.—Griffiths, Knight and Co., 50 and 51, Ford Street, Liverpool. March 1, 1895. Device: Pictorial representation of Ajax and the words "Ajax Brand." The essential particular is the device.

No. 185,883.—PERFUMERY (including toilet articles, preparations for the teeth and hair, and perfumed soap).—William Mottram, 95, Fleet Street, London. February 28, 1895. Word: "Ogo."

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

MARKING INK.

[846.] An extract from cashew nuts (cardol) is used to prepare a marking ink that does not require heating, and others are made with aniline blacks. There are many varieties of these, soluble in water and spirit respectively, and lack of success in their employment is frequently due to the use of improper material. Water-soluble "nigrosin" is a very good black for the purpose, and a formula given in the 'Era Formulary' is as follows:—Aniline black, 60 gr., strong hydrochloric acid, 60 m., alcohol, 6 dr. Dissolve and add hot solution of gum, $1\frac{1}{2}$ dr., in water, 3 oz. Cardol for marking ink is extracted by treating the fruits with a mixture of ether, 3 parts and methylated spirit, 1 part, allowing the greater part of the solvent to evaporate, or distilling it off, and treating the residue with an alkaline liquid, preferably lime water. The preparation is next reduced to the consistence of an ink, and is then ready for use. The following formula, from the *Western Druggist*, is for a silver ink which may possibly answer either with or without heating:—Dissolve silver nitrate, 7.75 Gm. in aq. dest. 23 C.c., and gradually add ammonia (10 per cent.) 15 C.c., or enough to redissolve the brown precipitate. Then dissolve sodium hydrate, 5 Gm., and gum acacia, 7.75 Gm. in aq. dest. 24 C.c., and mix with the first solution. Heat gently for ten minutes, and finally dissolve in the mixture water-soluble aniline black, 3.75 Gm.

ACID-PROOF CEMENT.

[847.] A cement, which is said to form a satisfactory coating to vessels intended to contain strong sulphuric or nitric acid, can be prepared, according to a French technical journal, by mixing powdered asbestos, 2 parts, with barium sulphate, 1 part, and sodium silicate (50° B.), 2 parts. For weaker acids silicate of 130° B. may be employed, whilst a mixture of asbestos, 1 part, sand, 1 part, and sodium silicate, 2 parts, is said to be preferable for warm nitric acid.

TO STRENGTHEN GELATIN.

[848.] Formic aldehyde solution (30 p.c.), added to gelatin solution (5 p.c.) in the proportion of 0.25 C.c. to .50 C.c., converts the gelatin into an insoluble and infusible jelly. With a smaller proportion of the formic aldehyde solution (0.05 to 0.025 C.c.) the jelly remains fusible, though it is more tenacious and resistant, and on drying is insoluble in warm water; with proportions varying from 0.01 C.c. downwards, the jelly, whilst very tenacious, is both fusible and soluble in warm water. An English patent (No. 4696, of 1894) has been taken out by E. Schering, of Berlin, for the addition of formic aldehyde during the manufacture of size and glue, and for other purposes.

ARSENIC IN DENTISTRY.

[849.] The following formula for an arsenical application is found by Dr. Johnson (*Dental Review*) to give successful results whenever used:—Mix arsenious acid, 20 parts, with cocaine hydrochlorate, 25 parts, and sufficient lanolin to make a paste.

PHOTOGRAPHIC VARNISH.

[850.] A photographic varnish may be prepared from gelatin by soaking strips of the latter in chrome alum solution (10 p.c.) for three or four days, then washing well and dissolving by the aid of a gentle heat in an equal weight of strong acetic acid diluted with twice its weight of water. On applying this varnish the film formed on drying is insoluble in boiling water.

* Compiled from the *Trade Marks Journal*.

Obituary.

On April 21, Charles H. Lockwood, Chemist and Druggist, Ossett. (Aged 46.)

On April 28, Professor Thiersch, the eminent German surgeon, died at Leipzig, at the age of 73. He was born at Munich in 1822, and after studying in his native town lived successfully in Berlin, Vienna, and Paris. After being Demonstrator of Pathological Anatomy at Munich for some time, he was appointed Professor of Surgery at Erlanger in 1854, and proceeded to Leipzig in 1867. During the Franco-Prussian war he was attached as Senior Surgeon to the 12th Army Corps. He had written numerous standard works on cholera, embryology, and other medical subjects.

On April 24 Professor Karl Ludwig died at Leipzig. As the *Standard* remarks, by the death of Professor Ludwig, Germany has lost one of her most eminent naturalists and physiologists. There is (says our Berlin correspondent) hardly any province of physiology in which he did not make important discoveries. To Helmholtz, Du Bois-Reymond, Brücke, and to him belongs the honour of having banished the doctrine of vitalism from German science. Some of his investigations were of vital importance to medical and natural science. His discoveries regarding the circulation of the blood and the fluctuations of pressure in the vascular system, resorption and the beginnings of the lymphatic vessels, the exchange of gases and the determination of the expansion of the gases of the blood, and assimilation in muscles in action and at rest, are among the finest achievements of modern physiology. By the invention of the "Kymographion" he created the graphic method, which is used not only in physiological research, but also in hospitals. He was born on December 29, 1816, at Witzzenhausen, in Hesse, studied at Marburg and Erlangen, and established himself as a private lecturer at Marburg in 1842. In 1846 he was appointed Extraordinary Professor of Comparative Anatomy there, and in 1849 ordinary Professor of Anatomy and Physiology at Zurich. From there he was called, in 1855, to the Josephinum (the former training academy for Army surgeons), in Vienna, as Professor of Physiology, and in 1865 to the University of Leipzig. There he worked as a teacher and investigator for thirty years, with rare acceptance and success, and the number of his hearers was uncommonly great. The physiological Institute of the Leipzig University, built under his direction, was the first of its kind, and has served as a model for many others. His principal work is his 'Compendium of Human Physiology' ('Lehrbuch der Physiologie des Menschen'). Since 1866 he has edited a periodical entitled 'Investigations of the Physiological Institute at Leipzig' ('Arbeiten aus der physiologischen Anstalt zu Leipzig').

CASIOR OIL extracted from the seeds by means of carbon bisulphide has been found (*Apoth. Zeit.*) to cause silver to blacken.

CARVESTRENE is a new terpene, discovered by Baeyer. It is prepared from dihydrocarvone, is optically inactive, boils at 178°, and yields inactive halogen compounds. Presumably it is the optically inactive modification of sylvestrene.

CARBON MONOXIDE is found by N. Gréhaud (*Comp. rend.*) to be produced as one of the products of combustion in the electric arc, and, in confined spaces, has caused illness among the workmen employed at electric light stations.

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

* Queries will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

ANSWERS.

ALFRED GREEN.—The book is published by Young J. Pentland, 11, Teviot Place, Edinburgh, at 6s. 6d.

D. HOOPER.—Nothing definite appears to be known concerning the origin of the word. In Murray's 'New English Dictionary' the following occurs:—"Calliatur or Calestour.—In *Calliatur* ('s) wood, a dye-wood from the Comorandel coast, identified by some with red sandal wood. 1687 *Lond. Gaz.*, No. 2269/2. Of *Calestours Wood*." It may be that the possessive form given by Murray indicates derivation from a proper name. The 'Century Dictionary' says, "Sometimes confounded with red sandal-wood."

PHARMACIST.—Your inquiry should have been addressed to the Editor. A frequent source of trouble in making the ointment is the presence of cotton-seed oil as an impurity in the olive oil used. The temperature should also be carefully regulated. If vaselin be used, you will have an intensely acid preparation totally different from what is required. You will probably find also that the acid liquor tends to separate.

CORRECTIONS.

FIRST EXAMINATION.—The REGISTRAR asks us to point out that the figures in the final column on page 944 were disarranged in making up the page last week. The number of candidates who failed at Southampton was 4, at Worcester 1, and York 7.

REVIEW.—The name of the publisher of Muskett's 'Prescribing and Treatment in the Diseases of Infants and Children,' on page 952, should have been given as Young J. Pentland, Edinburgh and London.

Publications Received.

[Publishers are requested to state the price of books sent for review.]

THE LONDON CATALOGUE OF BRITISH PLANTS. By FREDERICK J. HANBURY. Part I. Ninth edition. Pp. 50. Price 1s. (George Bell and Sons, London 1895.) From the Author.

THE SUMMER HOMES OF THE SEA-BIRDS. By W. J. C. MILLER. Pp. 5. Reprinted from *Nature Notes*.

ANATOMISCHER ATLAS DER PHARMAKOLOGIE UND NAHRUNGSMITTELKUNDE. By Drs. TSCHIRCH and OESTERLE. Parts 6 and 7, 1s. 6d. each. (Williams and Norgate, London.) From the Publishers.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Bird, Braithwaite, Dutton, Ettles, Gerrard, Hill, Hindle, Holloway, Hooper, Laing, Macartney, Martin, Miller, Moffatt, Pratt, Shapley, Skinner, Thompson, Turner, Umey, Will, Worth.

ANNUAL REPORT OF THE COUNCIL.

The fifty-fourth financial statement now submitted is sufficiently explanatory to render any detailed reference to the various items of account unnecessary. The special payment of £2000, on account of the extension of the Society's premises in Edinburgh, has been made out of revenue of the year.

Examinations. The number of candidates who presented themselves for the First examination during 1894 was 1541, an advance of 52 on the number recorded in the preceding year. The percentage of rejections, which was 50·37 in 1893, rose to 51·13, but is still below the average for the past five years. For the Minor examination, 1410 persons came before the Boards of Examiners, (970 in London, and 440 in Edinburgh,) and 886, or 62·83 per cent., failed. The percentage of failures is the highest for this examination in recent years.

The number of candidates for the Major examination has not increased, 147 persons having been examined last year, as against 152 in 1893. The percentage of failures was nearly 50 per cent.

At the last appointment of the Boards of Examiners, certain changes in their constitution came into operation which will it is hoped prove beneficial. The members of the Boards are now only eligible to hold office continuously for a period of four years, and teachers of Chemistry and Botany have been appointed members of the Boards as examiners in those subjects. The Council has been fortunate in obtaining the services of Professors Percy Frankland, McLeod, Reynolds Green, and Mr. Seward, on the Board for England and Wales, and Professors Geddes and Gibson on the Board for Scotland.

The Government Visitor, Dr. Stevenson, in his report on the examinations in London for the year ending March 31, 1895, refers specially to the number of failures in the First examination as indicating that the majority of the candidates have had a very defective preliminary education. He considers the examination by no means a severe one for youths, but remarks that, unfortunately, many of the candidates appear to be young men already engaged in the business of pharmacy. With regard to the changes in the *personnel* of the Board, Dr. Stevenson expresses the opinion that the introduction of those engaged in teaching chemistry and botany is likely to work well and to the advantage of candidates, since there is no one so well fitted to examine and gauge the knowledge of students as he who is engaged in teaching.

Libraries and Museums.

A considerable increase is to be noted in the use made of the Library in London by members and associates who are unable from various causes to personally visit the Library. The outward carriage of books is paid by the Society, and the Librarian's account for transmission of books is thus to a large extent a measure of the value of the Library to those connected with the Society. It is, therefore, satisfactory to learn that the amount paid during 1894 on this account was the highest for the past four years. The Council has by purchase of current books, and in other ways, endeavoured to keep the libraries of the Society well

abreast of pharmaceutical and scientific progress, and its efforts have been supplemented by donations of books and periodicals from public scientific bodies at home and abroad, as well as from private individuals. By the rearrangement of rooms in Edinburgh consequent upon the completion of the Society's new Hall and Laboratories, the somewhat limited library and museum accommodation will be extended.

In the Museum in London arrangements have been made to accommodate the largely increased number of medicinal plants in the Society's Herbarium. A complete catalogue of the Herbarium, including the indigenous British plants, has been prepared, and will probably be ready for distribution at the beginning of next session. It has become evident, however, that no catalogue, unless issued at very short intervals, can keep pace with the rapid growth of the Museum, and it is therefore proposed to issue, as an appendix to the existing catalogues, an annual "Museum Report," in which a full list of the donations of the current year will be given, together with explanatory notes and bibliographical references concerning them.

School.

The 53rd Session of the Society's School was opened on October 3, 1894, by an address to the students of the School of Pharmacy and their friends, by Mr. Walter Hills, a member of the Council. Mr. Hills chose for the subject of his address the influence of the Society on pharmaceutical and chemical education in Great Britain during the past fifty years. Among those present at the meeting were Sir Richard Quain, F.R.S., President of the General Medical Council, and Sir A. B. Garrod, F.R.S., both of whom expressed their appreciation of Mr. Hills' remarks.

Evening Meetings.

The evening meetings of the Society in London have been efficiently maintained during the past session, and most of the sciences allied to pharmacy are embraced in the series of papers read thereat. Botany was represented by Professor J. Reynolds Green, Sc.D., on "The Nervous System in the Vegetable World," and by a paper on the Dipterocarpaceæ by one of the Society's most distinguished Corresponding Members—Sir Dietrich Brandis, K.C.I.E., F.R.S. Professor Greenish contributed to the histological knowledge of *ipecacuanha* root, and Mr. E. M. Holmes gave valuable notes on "Eucalyptus Oil" and "Opoponax." Mr. J. C. Umney also reported on the characteristics of a false Buchu. In chemistry Dr. Paul and Mr. A. J. Cownley detailed the results of their investigations on the chemistry of *ipecacuanha*; and the paper by Mr. R. A. Cripps on "Standardised Preparations of Belladonna," concluded the work for the session.

In Edinburgh a useful series of papers has been provided, the contributors being Dr. Stockman, Messrs. Boa, D. Brown, D. Rainey Brown, Coull, Cowie, A. J. Dey, Dott, J. T. Fraser, W. I. Glass, Lunan, Lyon, Maben, Mackenzie, Stephenson, and W. Swan.

Reference was made in the last Pharmacopœia Revision. Report of the Council to the probable issue of a new British Pharmacopœia, and it was intimated that the co-operation of the Pharmaceutical Society in the compilation of that work would again be invited by the Medical

GENERAL

FINANCIAL

Receipts.

								£	s.	d.	£	s.	d.
Balance January 1st, 1894:—	London and Westminster Bank:—	Current Account	..	..	..	..	..	1478	11	4			
		On Deposit	..	..	..	..	..	2000	0	0			
	In Treasurer's Hands	..	..	..	..	..	..	98	15	11			
	In hands of Chairman of Executive (Scotland)	..	..	..	..	..	..	60	0	1			
											3637	7	4
Interest on Investments:—	Dividends and Ground Rents	..	..	..	..	..	..	187	17	4			
	Rent of 15, Bloomsbury Square	..	..	..	..	..	..	201	6	6			
											389	8	10
Subscriptions:—	1898 Members, Pharmaceutical Chemists	..	..	..	..	..	..	1467	18	0			
	608 „ Chemists and Druggists	..	..	..	..	..	..	688	8	0			
	1594 Associates in Business	..	..	..	..	..	..	1673	14	0			
	980 Associates not in Business	..	..	..	..	..	..	498	15	0			
	815 Students..	..	..	..	..	..	..	427	17	6			
								4701	7	6			
	19 Life Subscriptions	..	..	..	..	..	..	199	10	0			
	Fees paid upon restoration to the Society	..	..	..	..	..	..	7	15	0			
											4908	12	6
Examination Fees:—	1680 First Examination	..	..	..	..	..	..	3028	13	0			
	1 Modified „	..	..	..	..	..	..	1	1	0			
	1499 Minor „	..	..	..	..	..	..	6388	17	0			
	151 Major „	..	..	..	..	..	..	420	1	0			
								9788	12	0			
	Fees for Restoration to the Register	..	..	..	..	..	..	13	18	0			
	Registration Fees as Chemists and Druggists	..	..	..	..	..	..	22	1	0			
											9824	6	0
Journal:—	Advertisements and Sales..	..	..	..	..	..	..	..	..	..	8597	1	1
Register:—	Sales to the Government ..	..	..	..	..	..	..	147	10	0			
	Sundry Sales ..	..	..	..	..	..	..	11	10	0			
											159	0	0
Calendar—	Sundry Sales	..	..	..	..	..	..	..	..	..	28	16	0

£22,544 6 9

FUND.

STATEMENT FOR 1894.

Expenditure.

	£ s. d.		£ s. d.	
Annuity:—Mr. Elias Brombridge	..	..	400	0 0
Carriage of Books and Parcels	..	..	17	18 6
Certificates of Death	..	..	19	8 2
Evening and other Meetings	..	..	50	8 8
Examiners, Boards of—	<i>England and Wales.</i>		<i>Scotland.</i>	
Fees to Examiners	1526	11 0	670	19 0
Fees to Superintendents—First Examination	220	10 0	83	1 6
Hire of rooms for conducting First Examination	74	9 0	7	18 6
Travelling Expenses	188	18 6	63	3 6
Refreshments for Examiners	53	18 5	41	6 1
Apparatus, Drugs, and Chemicals for Examinations and sundry charges in connection therewith	237	2 9	54	9 8
	2251	9 8	870	18 8
	<i>(England and Wales)</i>		2251	9 8
			8122	7 11
Fees to the College of Preceptors	..	..	208	9 0
			8325	16 11
Fixtures and Fittings	..	..	87	17 6
Furniture	..	..	2	18 6
Gas, Water, Coal, Cleaning Materials, etc.	..	..	390	1 2
House Servants—Wages	..	..	278	8 8
Journal:—Salaries, Paper, Printing, Commission, Contributions, Reporting and Sundry Charges	..	..	5068	6 3
School of Pharmacy:—Emeritus Professor Bentley	..	..	25	0
Stipends of Professors of Practical Chemistry, Chemistry, Botany, and Materia Medica, and of Lecturer on Practical Pharmacy	..	..	600	0 0
Subscription to Royal Botanic Gardens	..	..	21	0 0
Lecturers' Assistants	..	..	111	8 4
Apparatus, Chemicals, and Specimens for Lecture Classes, Prize Medals, Certificates, etc.	..	..	78	0 8
Printing and posting prospectuses	..	..	40	12 10
			850	16 5
Law Costs—Balance of Account	..	..	779	4 6
Library:—Librarian's Salary	..	..	250	0 0
Purchase and Binding of Books	..	..	92	5 9
Librarian attending Meeting of the Library Association	..	..	10	10 0
Printing Catalogue	..	..	171	2 0
			523	17 9
Museum:—Curator's Salary	..	..	400	0 0
Assistant's Wages	..	..	46	16 0
Curator Attending Museums' Association Meeting	..	..	10	10 0
Specimens, Bottles and Sundries	..	..	103	15 6
			561	1 6
Expenses in Scotland:—Assistant Secretary—Salary	..	..	200	0 0
Taxes	..	..	84	8 10
Travelling Expenses—Members of Executive	..	..	39	18 6
Fuel, Light, Water, Cleaning, Service and Miscellaneous Expenses	..	..	216	8 8
Conversations at opening of New Examination Rooms	..	..	58	5 9
			544	1 9
Society's House in Edinburgh:—New Examination Rooms and Hall—Paid on Account	..	..	1961	15 0
Postage:—General	..	..	235	12 5
Journal (Cost of transmission to Members, Associates and Apprentices)	..	..	763	8 6
			999	0 11
Provincial Education—"Plymouth, Devonport, Stonehouse, and District Chemists' Association"	..	..	20	0 0
Register—Printing and Publication	..	..	173	8 6
Rent, Taxes and Insurance of Plate Glass	..	..	753	14 0
Repairs and Alterations	..	..	855	2 9
Stationery, Engraving, Printing, and Office Expenses	..	..	368	2 4
Calendar—Printing and Publication	..	..	116	5 7
Salaries:—Secretary and Registrar, and Clerks	..	..	1525	15 0
Research Laboratory	..	..	400	6 0
Cost of Materials supplied to the Jacob Ball Scholars	..	..	10	0 0
Herbarium and Council Medals, and Sundries	..	..	7	1 2
Travelling Expenses—Council and Committees	..	..	437	18 7
Refreshments for Council	..	..	50	5 5
Balance, December 31, 1894:—London and Westminster Bank	..	..	1890	15 4
In Treasurer's hands	..	..	23	17 4
In hands of Chairman of Executive (Scotland)	..	..	45	8 0
			1963	0 8
			222,544	6 9

AUDITORS' REPORT.

We, the undersigned Auditors, have examined the accounts of the Pharmaceutical Society of Great Britain, as presented in the Financial Statement, Benevolent Fund and Orphan Fund Accounts, and find them correct. We have inspected the Deeds relating to the House Property and Ground Rents named below, and also find that there were standing to the account of the Society at the Bank of England, and in the hands of the Society's Bankers, on the 31st December, 1894, the following, viz:—

		£	s.	d.	£	s.	d.
General Fund	2½ per cent. Consols				1,000	0	0
	Freehold Ground Rents at Paddington Green, London, W., cost	5,551	5	6			
	House in Edinburgh, cost	1,931	10	0			
	" " Additional Building, cost	1,961	15	0			
	Leasehold Premises:—Galen Place, cost	10,606	10	2			
	" 15 and 16, Bloomsbury Square, cost	9,527	5	3			
					29,578	5	11
					30,578	5	11
Benevolent Fund	2½ per cent. Consols			1050	0	0	
	Freehold Ground Rents at Strawberry Hill, cost.	1,020	12	6			
	Freehold Ground Rents at Battersea, cost.	12,213	0	0			
	Freehold Ground Rents at Broomwood Park Estate, cost	7,454	7	10			
	Freehold Ground Rents at West Kensington, cost.	5,809	2	1			
	St. Paul, Minneapolis and Manitoba Railway 4½% Bond				26,497	2	5
					100	0	0
					27,647	2	5
Orphan Fund	2½ per cent. Consols				355	0	0

March 26th, 1895.

EDWARD N. BUTT
S. LLOYD STACEY
CHARLES UMNEY
FRANCIS YATES

} Auditors.

The following Securities were also standing to the credit of the Society on December 31st, 1894:—

Pereira Memorial Fund	} 2½ per cent. Consols			100	0	0
Bell Memorial Fund				2,080	0	0
Hanbury Memorial Fund				400	0	0
Redwood Memorial Fund .	Great Indian Peninsula Railway Stock			400	0	0
Hills Prize Fund . . .	Russian Bonds			318	8	0
Manchester Pharmaceutical Association Scholarship Fund	Manchester Ship Canal Co. 4½% Debentures	700	0	0		
	2½ per cent. Consols	52	4	6		
				752	4	6

Council. The official invitation has been received, and at the Society's Council Meeting in February a Pharmacopœia Committee was appointed to assist the Committee of the Medical Council in carrying out the work in connection with the new edition of the Pharmacopœia. The following were appointed:—The President, Vice-President, Dr. W. Inglis Clark, Messrs. Ekin, Walter Hills, Martin, Martindale, Charles Umney, with Professor Greenish as Secretary to the Committee.

Council. The constitution of the Council has not been much altered during the year.

Mr. T. P. Gostling was elected in May in place of Mr. Marshall Leigh, who did not offer himself for re-election; and the vacancy occasioned by the resignation of Mr. A. C. Abraham has been filled by the election of Mr. W. Warren. The Council has also to record with regret the resignation of Mr. Richardson on account of ill health.

Research. The Annual Report of the Research Committee was presented to the Council in May.

Legal. When the last Annual Report was submitted allusion was made to several important law cases which were then pending. Particular interest attached to the appeal in the Edinburgh High Court of Justiciary. The appellant, who was the unregistered assistant of a medical man keeping an open druggist's shop, sought to reverse a judgment of the Sheriff's Court by which he was convicted of a breach of section 15 of the Pharmacy Act, 1868. The case for the appellant was argued before a full sitting of the Court, comprising the Lord Justice-General, Lord Justice-Clerk, Lord Adam, Lord Kyllachy, Lord Kincairney, and Lord Stormonth-Darling. The appeal was dismissed, the Court following the decision given in the English Courts in the case of this *Society v. Wheeldon*.

As a consequence, the words "any person who shall sell," in section 15 of the Pharmacy Act, 1868, have now received the same interpretation in Scotland as in England.

In the case of the *Society v. Armson*, in which the defendant, a grocer, was convicted for the sale of a proprietary preparation containing one-tenth of a grain of morphine to the fluid ounce, the Court of Appeal confirmed the decision of the Court of Queen's Bench, and of the County Court Judge.

As illustrating the difficulties experienced by the Council in its efforts to secure obedience to the law, reference may usefully be made to the case of the *Society v. Hornsey*. The defendant, a watchmaker and jeweller, was proceeded against under section 15 of the Pharmacy Act, 1868, for illegally keeping open shop for the retailing of poison, and evidence was adduced of his having sold a preparation of corrosive sublimate. The Exeter County Court Judge gave verdict for the defendant, however, on the ground that "open shop" in the Act meant an open chemist's shop, and that defendant had not kept such a shop. The principle involved seemed to the Council so important that an appeal was by their instructions immediately lodged against His Honour's judgment. On the matter coming before Justices Cave and Wright, in the Queen's Bench Divisional Court, the appeal was allowed, their lordships agreeing that the defendant by using a shop for retailing poison

to any member of the public who might ask for it was keeping an "open shop" within the meaning of the Pharmacy Act, 1868.

In the matter of patents the Council has been kept carefully apprised of the nature of medicinal preparations which have passed the Great Seal. In four instances the Society has been successful in securing the revocation of patents granted in respect of preparations containing scheduled poisons. The procedure in the Chancery Court involves heavy expense to the patentees, as well as to the Society, and it is hoped that a knowledge of this fact may render proprietors of nostrums less eager to resort to the Patent Office with their preparations.

Pharmacy Bill. The Council after earnest consideration has decided that it is hopeless to go to Parliament in the present

state of public business, and resolved not to introduce any measure this session. It should be clearly understood, however, that it is not intended to abandon the effort to obtain further powers, but merely to postpone the attempt until there is a more reasonable prospect of success than exists at present.

Weights and Measures. A communication has been received from the London Chamber of Commerce directing attention

to the present state of the law relating to weights and measures, and asking the Council's support to a Bill drafted by the Chamber to remedy the defect. The Council resolved to support the measure, which had for its object the removal of the restriction prohibiting wholesale druggists and others from using metric weights and measures. Subsequently the Bill was referred to a select committee of the House of Commons, and the Council has made an application to be allowed to give evidence before that Committee. The President and Mr. Martindale have been appointed to represent the views of the Council on the subject.

North British Branch. The report of the Executive of the North British Branch was submitted to the Council at its last meeting, and gives details of the work carried out by the Executive during the past year.

New Premises in Edinburgh. The additions to the Society's premises in Edinburgh, necessitated by the continual growth of the work in Scotland, were completed last autumn, and the new examination hall and laboratories were formally opened at a *conversazione* and reception, which was held at 36, York Place on November 30, by the President and Council, assisted by Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch. A full description of the additional accommodation provided is recorded in the *Pharmaceutical Journal* of December 1. Since the official celebration of their completion, the new premises have been used for the January and April examinations and the evening meetings. The satisfaction afforded by the result is valuable testimony to the care and forethought with which the Executive—under the able guidance of its Chairman—has carried out the work entrusted to its charge. The laboratories are well adapted to the requirements of the examinations, and the Society now has ample scope for efficiently carrying on its work in Scotland.

**Benevolent
Fund.**

The Council regrets to have to report a slight diminution in the annual income from subscriptions to this Fund. In 1893 the sum received amounted to £1712 18s. 6d.; last year it was £1702 19s. 7d. This is not a large falling off, but it would seem that the generous policy hitherto pursued of granting relief beyond the limit of strict solvency in expectation of increased support from chemists and druggists is one that cannot be followed in future without grave anxiety. The total amount spent in relief during 1894 was £2743 4s.—only £2 less than in the previous year. Four additional annuitants were elected in December last, and the list now comprises forty-six names. The payment of annuities involves an annual charge of about £2200, and represents, at 3 per cent., the product of a capitalised sum of more than twice the amount now standing to the credit of the Fund. It is evident that in order to continue its good work, the Fund must either receive augmented support from the trade or restrict the grants of assistance to deserving applicants. In donations and legacies the Council has to acknowledge the receipt of £752 5s. during 1894, and feeling as it does the urgent and growing necessities of the Fund, it ventures to express the hope that this form of benevolence may commend itself to those who have prospered in pharmacy.

**Orphan
Fund.**

The income of this Fund from subscriptions is practically the same as in 1893. The interest from investments is sufficient to maintain in the London Orphan Asylum the child elected "Hills" orphan in June, 1893.

Obituary.

The death-roll includes the names of Professor F. A. Flückiger, an Honorary Member of the Society, and joint-author, with the late Daniel Hanbury, F.R.S., of 'Pharmacographia'; Professor Jean Bommer, of Brussels, and Magister Andrew Ferrein, of Moscow—Corresponding Members. Also of Edward Horner, J. Beech, Wm. Hooper, and Wm. Darling—Founders of the Society; W. D. Savage—a former member of the Council; and the following Local and Divisional Secretaries of the Society:—J. Sadleir, Gloucester; J. Martin, Motherwell; W. Smyth, Merthyr Tydfil; R. Parkinson, Liverpool; W. Dyer, Halifax; R. Griffith, Slough; A. Seath, Dunfermline; G. Pattison, Central Finsbury; F. T. Silvers, Camberwell; E. L. Hickey, Chelsea; and R. O. Fitch, South Hackney. The Benevolent Fund has lost a generous supporter by the death of Mr. S. M. Burroughs.

PHARMACOPŒA NORVEGICA.*

EDITIO TERTIA, 1895.

The new Norwegian Pharmacopœa which comes into force on January 1, 1896, is written in the vernacular, whilst the Pharmacopœa Suecica, editio septima, 1888, like the second edition of the Norwegian Pharmacopœa, 1870, and its addendum, 1879, is in Latin. The Pharmacopœa Danica, editio tertia, is in Danish, so that the project suggested a few years ago for a "Northern Pharmacopœia" for the three states—Denmark, Norway, and Sweden—appears to have been dropped.

The names of the preparations are Latin, and the principles upon which they are based are the same as those adopted for the previous edition.

The strength of the acids has been fixed, as in the second edition, somewhat empirically; acetic, hydrochloric, and nitric acids contain 25 per cent., dilute hydrochloric, dilute sulphuric, and phosphoric acid 10 per cent. of the corresponding anhydrides. This edition of the Norwegian Pharmacopœa, like the second, is peculiar in directing bitter almond water and kermes to be artificially produced by admixture.

For only a few drugs, as cinchona bark, opium, have methods of assay been adopted; no extracts are directed to be assayed or tested qualitatively for alkaloid or glucoside.

Several extracts which in the German Pharmacopœa are soft, in the Norwegian are dry, as for instance gentian, belladonna, henbane (the latter two with addition of sugar of milk).

An important change has been made in the maximal doses; these in the second edition were given in drops for all fluid preparations, whilst in the third edition they are uniformly stated by weight. The majority are identical with those of the German Pharmacopœa.

The following details of tests and formulæ, some of which were included in the second edition of the Norwegian Pharmacopœa, will probably be of interest.

ÆTHER SPIRITUOSUS CAMPHORATUS (camphor drops).—Camphor, 15; ether-alcohol, 85.

AQUA AMYGDALÆ AMARÆ is prepared by mixing 50 parts of hydrocyanic acid (2 per cent.), 4 of oil of bitter almonds (free from hydrocyanic acid), 146 of spirit, and 800 of water; contains 0.1 per cent. of hydrocyanic acid.

AQUA CHLOROFORMI.—Chloroform, 1; water, 199.

AQUA CINNAMOMI SPIRITUOSA.—Oil of cinnamon, 2; dilute spirit, 499; water, 499.

AQUA AROMATICÆ EXTEMPORANÆE.—Ethereal oil, 1; hot water, 999.

AQUA ROSÆ.—Otto of rose, 1; hot water, 4000.

COLLODIUM ELASTICUM.—Collodium, 99; glycerin, 1

DECOCTUM CHINÆ ACIDUM.—Cinchona (succirubra) bark, 20; dilute (10 per cent.) hydrochloric acid, 3; water to produce 200 of strained liquid.

DECOCTUM CHINÆ CUM SENECA.—Cinchona bark, 7; senega root, 3; water to produce 100.

ELECTUARIUM APERIENS.—Bitartrate of potassium, 6; powdered senna, 14; purified tamarind pulp, 30; syrup of manna, 50.

EMPLASTRUM ADHESIVUM.—Lead plaster, 80; yellow wax, 10; mastiche, 10.

EMULSIO CAMPHORÆ.—Powdered camphor, 1; mucilage, 40; water, 159.

EXTRACTUM BELLADONNÆ (extractum atropæ).—Powdered belladonna leaves are exhausted with dilute spirit, the tincture evaporated to dryness, and the residue mixed with one-third of its weight of sugar of milk. (Extract of henbane is prepared in a similar manner.)

* Translated from the *Pharmaceutische Centralhalle*.

FERRUM REDUCTUM should show 88 per cent. of metallic iron when tested in the following manner: 0.5 gramme reduced iron is mixed in a flask with 2 grammes of iodine, 1.5 gramme of iodide of potassium, and 30 grammes of water; after a time the liquid is filtered off and should not colour chloroform violet when shaken with it.

GLACIES is adopted without further description.

GRANULÆ DIOSCORIDIS (arsenic pills).—Very finely powdered arsenious acid, 1; powdered sugar, 10; powdered sugar of milk, 10; powdered gum, 10, with sufficient water to form 1000 pills (each containing 0.001 gramme arsenious acid).

INFUSUM RHEI ALKALINUM (rhubarb drops).—Sliced rhubarb root free from powder, 25; bicarbonate of sodium, 3; water, 170; macerate twelve hours, strain, boil the liquid, cool, make up to 170 with water, and add cinnamon water, 30.

INFUSUM SENNÆ COMPOSITUM (senna mixture).—Cut senna leaves, 10; crushed coriander, 2; boiling water to produce 70 of strained liquid; in this dissolve manna, 25; tartrate of potassium, 5.

KERMES MINERALIS.—Oxide of antimony, 1; red sulphide of antimony, 9. The Pharm. Norv. contains also a red sulphide of antimony without oxide.

(To be continued.)

EVOLUTION AMONG PLANTS.

At a recent meeting of the Massachusetts Horticultural Society, a paper, of which the following is an abstract, on "Experimental Evolution Among Plants," by L. H. Bailey, professor of horticulture in Cornell University, Ithaca, N.Y., was read by the author. The speaker prefaced his remarks by saying that all thoughtful persons are now evolutionists, whether they know it or not. They believe in some kind of a transformation of species in the same way that they believe in the gradual unfolding and growth of human institutions. It is by no means essential to a belief in evolution that the person should hold to a single origin of all forms of life.

The speaker then proceeded to consider the question, "Do new species originate now?" The notion that a species, to be a species, must have originated in nature's garden and not in man's, has been left over to us from the last generation—it is the inheritance of an acquired character. John Ray, toward the close of the seventeenth century, appears to have been the first to use the word species in its technical natural history sense, and the matter of origin was an important factor in his conception of what a species is. Linnaeus' phrase is familiar. "We reckon as many species as there were forms created in the beginning." Darwin elaborated the new conception—that a species is simply a congregation of individuals which are more like each other than they are like any other congregation—and with a freedom from prejudice which is rarely attained even by his most devoted adherents, he declared that "one new

variety raised by man will be a more important and interesting subject for study than one more species added to the infinitude of already recorded species." The old naturalists threw the origin of the species back beyond known causes; Darwin endeavoured to discover the "origin of species," and it is significant that he set out without giving any definition of what a species is. It is important, when we demand that a new species be created as a proof of evolution, that we are ourselves open to conviction that the thing can be done. The fact is that the practice of systematic or descriptive botany is at variance with the teachings of evolution. Every naturalist now knows that nature does not set out to make species. She makes a multitude of forms which we, merely for purposes of existing methods of botanical description and nomenclature, call species.

The speaker then proceeded to show that there has been as wide variation in very many garden plants as there is between accepted botanical species of the same genus.

Species-making forever enforces the idea of the distinctness and immutability of organic forms, but study of organisms themselves forever enforces an opposite conception. The intermediate and variable forms are perplexities to one who attempts to describe species as so many entities which have distinct and personal attributes. So the garden has always been the bugbear of the botanist. Even the lamented Asa Gray declared that the modern garden roses are "too much mixed by crossing and changed by variation to be subjects of botanical study." He meant to say that the roses are too much modified to allow of species-making. The despair of systematic botanists is the proof of evolution.

If species are not original entities in nature, then it is useless to quarrel over the origination of them by experiment. All we want to know, as a proof of evolution, is whether plants and animals can become profoundly modified under different conditions, and if these modifications tend to persist. Everyone interested knows, as a matter of common observation and practice, that this is true of plants. He knows that varieties with the most marked features are passing before him like a moving panorama. He knows that nearly every plant which has been long cultivated has become so profoundly and irrevocably modified that people are disputing as to what wild species it came from. Consider that we cannot certainly identify the original species of the apple, peach, plum, cherry, orange, lemon, wine grape, sweet potato, Indian corn, melon, bean, pumpkin, wheat, chrysanthemum, and nearly or quite a hundred other common cultivated plants. It is immaterial whether they are called species or varieties. They are new forms. Here is the experiment to prove that evolution is true, worked out upon a scale and with a definiteness of detail which the boldest experimenter could not hope to attain were he to live a thousand years. The horticulturist is the only man in the world whose distinct business and profession is evolution. He of all other men has the experimental proof that species come and go.—*Pharmaceutical Era*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MAY 11, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to "Street Brothers," 5, Beale Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

AFTER the reading and confirmation of the minutes of the previous meeting, the PRESIDENT read a letter from Mr. H. N. B. RICHARDSON, stating that on account of his father's health, he had been commissioned to tender his resignation as a member of the Council. In expressing the regret of the Council at receiving this intimation, the PRESIDENT referred to the fact that Mr. J. G. F. RICHARDSON was one of the early students in the Society's School, and one of the earliest examined men who became a member of the Council, adding also that his services in matters of education would be much missed. A resolution to that effect was carried unanimously.

In announcing the death of Mr. DARLING, of Manchester, one of the founders of the Society, the President mentioned that there are now only nine founders left.

Dr. SCHWEINFURTH, of Cairo, and Mr. ROBERT THOMSON, late Superintendent of the Botanic Gardens, Jamaica, were elected corresponding members. Ten pharmaceutical chemists were elected members of the Society, one hundred and three associates were elected, and forty students.

The report of the Executive of the North British Branch of the Society was presented and adopted. As usual, it gave an account of the work done during the past year, but it had a special feature of interest on account of the additions which have been made to the Society's house in Edinburgh, and the consequent rearrangements which they have entailed. The increased convenience with which the examinations can now be conducted, and the advantages of the new hall for the holding of evening meetings, appear to have afforded great satisfaction in Scotland and to be highly appreciated. Expression was given to this feeling by Mr. STORRAR.

The report of the Government Visitor of the examinations in London, recently received from the Privy Council, was presented. Speaking of the changes in the examiners, Dr. STEVENSON expresses the opinion that there has not been any considerable change in the proportion of rejections in the qualifying examination. He speaks with approval of the introduction of examiners engaged in teaching chemistry, physics, and botany as being likely to work well, and to the advantage of candidates. In the Major examination there has been some improvement in the number of passes, and evidence that the candidates have had a better scientific training. At the same time regret is expressed that so small a number of chemists and druggists present themselves for this examination, and that the larger number are content to remain without the higher qualification of pharmaceutical chemist.

On the subject of the Preliminary examination, Dr. STEVENSON again refers to the unfortunate fact that many of the candidates are past the age at which it is desirable that this examination should be passed. Coupled with that fact, the large proportion of rejections is evidence of defective education, and of the pressing need for improvement in that part of the qualifying system.

The report of the Finance Committee did not contain any exceptional details, except mention of the receipt of twenty-five guineas from the Chemists' Ball Committee, a sum from a smoking concert at Liverpool, and ten guineas from Mr. WATERALL, of Nottingham, as donations to the Benevolent Fund.

On the recommendation of the Benevolent Fund Committee ten grants, amounting in the aggregate to one hundred and five pounds, were ordered to be paid. In moving the adoption of the report the Vice-President referred to the large amount of the grants made on this occasion as showing the need for liberal support, and he expressed satisfaction that subscriptions to the Fund are coming in so well. In connection with the case of MARY MARGARET LEWIS, who is a candidate for election to the Welsh Girls' School, he mentioned that Alderman VAUGHAN MORGAN has interested himself on her behalf, as well as Mr. OCTAVIUS MORGAN, the late Member for Battersea, with the result of securing a number of votes which he hoped would lead to her election. Mr. JOHNSTON, in speaking of a grant in a Scotch case said that, though proud of the fact that applications for relief from the Benevolent Fund are rarely made from Scotland, he was not the less pleased to find a deserving case entertained in a good spirit, and he hoped this circumstance would open the hearts as well as the pockets of members and of those outside of the Society. In support of this remark, Mr. Young pointed to the probability of an in-

creasing application for grants as a result of the terrible competition in business, and the absence of any other provision for those who grow old in the service of such enterprises as are now the subject of so many prospectuses.

The annual report of the Research Committee was presented and entered on the minutes upon the motion of the PRESIDENT. Some remarks were made as to the nature of the work carried out in the laboratory, the students working in it, and the financial statement relating to it. The discussion of the motion of which Mr. MARTINDALE had given notice, was taken in Committee, with the result that it was resolved to defer the consideration of the subject for the in-coming Council.

On the subject of the investment of funds, it was decided, on the motion of the PRESIDENT, to refer its consideration to a committee. Mention was made of a case of poisoning by soothing syrup, to which attention has been directed by a communication from the Privy Council. A letter from the Plymouth, Devonport, Stonehouse, and District Chemists' Association, relating to the Early Closing Bill, was referred to the Parliamentary Committee. Another letter, from the Registrar of the Pharmaceutical Society of Ireland, asking that the Preliminary examination of that Society should be accepted in lieu of the Society's examination, was referred to the Board of Examiners.

The report of the General Purposes Committee recommended the award of prizes to the candidates named at page 1012. The draft of the annual report, printed at page 993, was adopted, and after the legal portion of the Committee's report had been considered, the Registrar was authorised to take proceedings against several persons who have been reported as infringing the Pharmacy Act.

THE PURIFICATION OF WATER.

At the present day no one doubts the necessity of a constant supply of pure water, but as pointed out by Dr. GUINOCHE, in his work on the purification, filtration, and sterilisation of potable waters,* the definition of purity has varied from time to time. The organoleptic characters of a water—odour, flavour, and clearness—do not alone suffice to establish its fitness for dietetic purposes; its chemical properties must also be taken into account, as well as its biological characters. Briefly, a pure water for potable use should be free from solid particles, objectionable matter in solution, and living organisms. In order to meet these requirements, in the case of natural waters, it is almost invariably necessary to filter, precipitate by chemical means, or sterilise by heat or otherwise, or it may even at times be necessary to resort

to all three methods. Filters act mechanically for the most part, but (and in some cases to an important extent) may also act chemically. If, too, the particles of which they consist are sufficiently close together microbes may be thus mechanically eliminated. But whilst it would thus appear that the effectiveness of a filter is in direct proportion to the fineness of its pores, it is found in practice that the rate of flow may be reduced so as to cause great inconvenience if the filtering medium be too dense. It is desirable, therefore, in selecting a filter to carefully ascertain its exact capabilities in this respect, so that it may not be called upon to do work beyond its capacity, and thus, maybe, prove ineffective and create a sense of false security by its use. Dr. GUINOCHE enters at length into the consideration of the various points involved in this question before proceeding to deal with the details connected with the filtration and purification of water, and this part of his book is worthy of more than passing attention.

The most effectual means of preventing risks arising from the use of impure water by any community is, of course, to filter and otherwise purify the whole supply at a central station, by means of sand, gravel, etc., in the form of immense beds. A considerable portion of Dr. GUINOCHE's work is devoted to this part of the subject, as well as to purification by electricity and by chemical means—chalk, soda, magnesium salts, alum, iron, potassium permanganate, citric acid, charcoal, etc., being employed in the respective processes described. But the more interesting part of the subject, from an individual point of view, is that which deals with domestic filtration, in which the operations are necessarily carried out on a much smaller scale. The processes described are exceedingly numerous, though but few of them are commonly known. Thus, brief descriptions are given of the filter devised by AMY in 1745, in which sponge, cotton, and sand were utilised; of that of JAMES PEACOCK, an Englishman, who in 1791 took out a patent for a filter in which sand and gravel were employed; DUCHESNE's filtering stones (1800); SMITH, CUCHET, and MONTFORT's filter containing sand, charcoal, and sponge (1806); and numerous variants on these, introduced by later experimenters. The greatest interest, however, attaches to the filters of CHAMBERLAND (PASTEUR system), and BERKEFELD, which have been shown during recent years to be the most effectual in use. The first is in great favour in France, and receives the greatest amount of attention in the book, but both are described and figured under various forms for use on both the large and small scales. The properties of the two, so far as English experiments prove, may be briefly summed up in the statement that whilst the PASTEUR-CHAMBERLAND filter removes all suspended impurities in water, including bacteria,

* 'Epuraton, filtration, et stérilisation des eaux potables (J. B. Baillière et fils, Paris).

over a greater length of time than the **BERKEFELD**, the latter will deliver a much greater amount of water in a given period. Moreover, the **BERKEFELD** filtering cylinders can be made much larger than the **CHAMBERLAND** cylinders, without risk of imperfection or fracture. They are also very readily cleaned, a point of some little importance when domestic filters are in question.

Either of these filters, however, in addition to simple filtration, i.e., removal of suspended impurities, possesses a powerful sterilising influence, which is of longest continuance in the case of the **CHAMBERLAND** apparatus. If, therefore, the water has been first rendered free from objectionable soluble constituents by chemical precipitation, subsequent filtration through one of these filters ensures a supply of water sufficiently pure for potable purposes. In certain cases where further sterilisation may be necessary, the action of heat can be resorted to, and it is found in practice that all organisms may be destroyed by heating the water to a high temperature or maintaining at a lower temperature for a certain length of time. Dr. **GUINOCHE** gives numerous statistics bearing on this aspect of the matter, and also describes several forms of ingeniously contrived apparatus for sterilising water by heating, both on the domestic and larger scales. Certain of these act on the water under pressure, and some have attachments for subsequently cooling the liquid again and rendering it palatable. Finally, in concluding the work, which can be recommended as deserving the notice of everyone interested in the subject of which it treats, Dr. **GUINOCHE** suggests that water should preferably be obtained from springs, but in cases where rivers and lakes must be utilised the product should be carefully purified as far as possible before being distributed, and domestic filtration should be resorted to in all cases to ensure the total removal of microbes that may have been collected during the passage of the liquid from the place of distribution.

OPENING OF THE SCHORLEMMER LABORATORY.

THE opening of the **SCHORLEMMER** Laboratory last week, as pointed out by the *Manchester Guardian*, in many ways an interesting event in the history of English chemistry, no less than in that of the Owens College. Professor **SCHORLEMMER** was the first professor of organic chemistry in England, and the laboratory founded in his memory is the first in this country to be solely devoted to that branch of the science. **SCHORLEMMER** himself was recognised by all who knew him as a lover of chemistry for its purely intellectual rewards. He studied it in its more abstract and its historical aspects, coveting neither the honour nor the material advantages which lay within his grasp; and all his life he remained known but to a few, and relatively poor. "Nevertheless, his work forms the corner-stone of the comprehensive theories which within recent years have given chemists so marvellous a mastery over the transformations of matter, and have directly led to those triumphs in chemical industry which now employ many thousands of workers."

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, May 8, 1895.

Present—

MR. MICHAEL CARTMIGHE, PRESIDENT,

MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT,

Messrs. Allen, Atkins, Bottle, Gostling, Grose, Hampeon, Harrison, Hills, Johnston, Martin, Martindale, Newsholme, Schacht, Southall, Storrar, Warren and Young.

The minutes of the last meeting were read and confirmed.

RESIGNATION OF MR. J. G. F. RICHARDSON.

THE PRESIDENT read a letter from Mr. H. N. B. Richardson, on behalf of his father, tendering his resignation as a member of the Council, which he did with great regret, but he felt that the state of his health would not allow him to continue to hold office longer. He would, therefore, move "That this Council regrets to hear of the continued indisposition of Mr. J. G. F. Richardson, and in accepting the resignation of his seat on the Council after sixteen years' service, desires to express the hope that with rest his health may improve." Mr. Richardson was one of the early students in that institution, and one of the earliest examined men who became a member of the Council. His knowledge of the branches of science bearing on pharmacy was distinctly above the average, and in matters of education especially, his services on the Council would be much missed.

The motion was seconded by the Vice-President, and the resolution carried unanimously.

DEATH OF A FOUNDER.

THE PRESIDENT reported the death since the last meeting of the Council of one of the founders of the Society—of whom there were now only nine left—in the person of Mr. Darling, of Manchester. Personally he had not the honour of Mr. Darling's acquaintance, but he had some recollection of the work which he had done. His son was a distinguished student in natural science at Owens College, and was regarded in the north as a highly intellectual young man. The father, whose death they regretted, was a type of what was known as the old school of pharmacists. He was reputed for a knowledge of many things, and what he did know was of a thorough character.

CORRESPONDING MEMBERS.

THE PRESIDENT moved the election, as corresponding members, of Dr. Schweinfurth, Cairo, and Robert Thomson, late Superintendent of the Botanic Gardens, Jamaica, their names having been suspended in the Library for a month in the usual way. They were both distinguished men, and he had no doubt would be useful members of the Society.

DIPLOMAS.

The undermentioned being duly registered as Pharmaceutical Chemists, were granted diplomas stamped with the seal of the Society:—

Banks, Edward Herbert Hardy
Brown, William James
Bryant, Nicholas John Andrew
Carter, William Henry
Elliott, Oliver Thomas
Gates, Colvin
Gaul, Ernest George
Grier, James
James, David Griffith
Morrey, George
Pearce, Seymour Rowland
Prior, James Siddall
Thorp, Ernest
Tree, John
White, Henry Fox

ELECTION OF MEMBERS.
Pharmaceutical Chemists.

The following having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society.

Bryant, Nicholas John A. Truro
Elliott, Oliver Thomas Leicester
Gates, Colvin Glasgow
Gaul, Ernest George Kennington
Lakeman, Nicholas Frank. Modbury
Morrey, George Holborn
Pearce, Seymour Rowland Brixton
Prior, James Siddall Melton Mowbray
Thorp, Ernest Southport
Tree, John Morpeth

ELECTION OF ASSOCIATES IN BUSINESS.

The following having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Bamford, William Rochdale
Baxter, Gilbert Buchanan Blackburn
Bayley, Edward George Eastbourne
Bonnnett, Frederick Newington
Brearley, Richard Samuel Greenwich
Buckley, John Davies Woolwich
Cameron, Lewis Colinsburgh
Carmichael, Matthew Crossmyloof
Cleghorn, James Yoxford
Dampney, John Norwood
Dawson, Alexander Fraser Edinburgh
Dean, George Saville Rochdale
Douglas, William Boyce Egham
Edwards, Henry Charles Hastings
Fisher, George Robert Leamington Spa
Flint, Francis Bramwell Manchester
Floyd, Harry Victor Haverhill
Forbes, Alexander Queensland
Forbes, Robert Newcastle-on-Tyne
Furnival, Charles Edward Leicester
Giles, William Wallsend-on-Tyne
Gourd, William Portsmouth
Gregory, George Henry Scarborough
Hallstone, William Edward Camberwell
Henshaw, Charles James Skelmersdale
Hewitt, Charles Herbert Sheffield
Jenkins, Morris William St. Clears
Jones, David Lloyd Newport
Le Seelleur, Thomas John Jersey
Lloyd, James Herbert Bedford

McKellar, Arthur Glasgow
McLeod, Louis Inverness
Marratt, Thomas Lewisham
Maxwell, Peter Hamilton Harrogate
Parker, Edward Scarborough
Paternoster, William C. T. Cirencester
Peacock, John Rutherford Glasgow
Pennington, John Richard Workson
Rawthorne, Reginald Withington
Rideal, Frank Milnrow
Sharman, Herbert Broughton. Potter's Bar
Shaw, Thomas Alexander Leeds
Sinclair, John Gordon Nottingham
Smith, Joseph Henry Moreton-in-Marsh
Smith, Percy Croydon
Turnbull, James Blackpool
Turner, John Edward Basingstoke
Wilkins, Charles Henry Southampton
Wilkinson, William W. Kensington

ELECTION OF ASSOCIATES.

The following having passed the Minor examination, and tendered, or paid as "Students," their subscriptions for the current year, were elected "Associates" of the Society:—

Attenborough, H. Langley Leamington
Bastow, Sidney London
Bateson, Alfred Campbell Kendal
Brown, Harold Southport
Brown, Harold Edwin Hull
Callaway, James Thomas London
Cashmore, Montague London
Compton, Richard William Leicester
Cooper, Burton Fred. John London
Cuff, Sidney Willmot New Barnet
Curry, Frank Dorking
Dawson, Hy. Gray Woodhouse. Derby
Dawson, Peter Glasgow
Edwards, William Richard London
Ferguson, Howard Chesterfield
Flower, John Scott Wakefield
Forster, Horace Reginald Wm. Chatham
Forsyth, Douglas Millar Edinburgh
Fraser, Henry Aberdeen
Fuller, Herbert Emery Norwich
Giles, Lewis John Folkestone
Greaves, Ernest Walter Ironville
Gwinn, Frederick Walter Stratford
Harries, John Davies Milford Haven
Heden, Joseph Henry Kineton
Hemming, William Hubert Birmingham
Hull, John Heber York
Hunt, Henry Lionel Bath
Ibbotson, Oswald Wakefield
Jones, John Emrys St. Asaph
Kinsman, William Ernest Devonport
Knowles, Charles John Forest Gate
Marsh, Albert Crewkerne
Mauder, William Henry Teignmouth
Merry, Charles Johnstone
Moore, Francis Ayrton London
Mould, John Salmon Louth
Mundell, Stephen Robson Leeds
Oliver, Gwilym Emrys London
Palmer, Charles Nicholas Stokesley
Pratt, William Shipston-on-Strour
Pryke, Harry Kenneth Braintree
Read, Harold McLean Alnwick
Robinson, Ernest Temple Harrogate
Sayers, Frederick William Ardingley
Seath, John Alexander Dunfermline
Simnett, Herbert Frank London
Smart, Gordon Huntly
Snell, William Kennard Okehampton

Sparks, Percy Ipswich
 Stoddart, James George Young Edinburgh
 Widgery, Ernest Burnham
 Willson, Robert Wherry Peterborough
 Young, John Arthur Newport (Mon.)

ELECTION OF STUDENTS.

The following having passed the First examination, and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Adams, John Uxbridge
 Cameron, John Sinclair Burton-on-Trent
 Castelow, Walter Thomas Leeds
 Chandler, Martin William Swindon
 Chapman, Edgar Marsh Scarborough
 Clarke, Charles William Kensal Rise
 Coates, Richard Bradford
 Cox, Thomas Finchett Edinburgh
 Crecraft, Richard Preston Nottingham
 Daniels, Herbert Joseph Leicester
 Desmond, Dennis W. A. London
 Farr, Francis William Yaxley
 Hawkesworth, John George Sheffield
 Herd, Robert Stark Kirkcaldy
 Hunt, George Paul Allen Ipswich
 Hunt, Harold Edward Poole
 Ingle, George Edward Whittlesea
 John, Morgan Treorchy
 Jones, Thomas Henry Owain Upper Bangor
 Jones, Thomas Pugh Talley
 Logle, John Moffat Arbroath
 Low, Charles Pearson Chester-le-Street
 Lownsbrough, Robert E. Scarborough
 Macdoolyn, Henry M. Ramsgate
 Muscott, Rowland William Birmingham
 Odgers, William Henry Wrexham
 Oldham, G. W. N. Farnham
 Owen, William Hibbert Earlestown
 Flouwright, Alfred London
 Potter, William Plaistow
 Scott, John Irwin Bootle
 Scott, John Wilson Birmingham
 Smith, Frederick A. Upsher Birmingham
 Strong, James Branford Deal
 Todd, John William Leicester
 Wade, Walter Colin Sidcup
 Williams, John Lilanelly
 Williamson, Joseph Bertram Liverpool
 Wright, Joseph Brigg
 Yapp, Helen M. Birmingham

RESTORATIONS TO THE REGISTER.

The names of the following persons who have severally made the required declarations and paid a fine of one guinea were restored to the Register of Chemists and Druggists:—

Charles Estcourt Day, 26, Girdlington Road, Man-
 ingtonham, Bradford.

Solomon Gervas Maw, Woodhouse, near Sheffield.

George Edward Rogers, 1, Chesnut Villas Edmonton.

Several persons were restored to their former position in the Society upon payment of the subscription for the current year and a nominal restoration fee of one shilling.

REPORT OF THE EXECUTIVE OF THE NORTH BRITISH BRANCH.

This report was as follows:—

"The Executive of the North British Branch has now to submit the following report on the work of the year March, 1894, to March, 1895:—

"At a meeting of Executive held on April 19, 1894, it was arranged that the annual election should take place on Thursday, June 21, 1894, and the present Executive was accordingly elected at a meeting of members and associates in business of the Society residing in Scotland, held on the above date.

"The Executive has held three meetings during the year. At the first meeting, on June 28, Mr. James Laidlaw Ewing, Edinburgh, was elected Chairman, and Mr. Charles Kerr, Dundee, Vice-Chairman, and the resident members were appointed a General Purposes Committee to attend to business arising between meetings of Executive.

"The General Purposes Committee has met five times and has had charge of the work connected with the completion and opening of the new premises and the arrangements for evening meetings.

"At the meeting of the Executive in June, 1894, a special committee for the nomination of Examiners was appointed, and reported to the meeting of Executive in November, when the following were nominated for election by the Council as the Board of Examiners in Scotland for 1895, viz.:—Professor Patrick Geddes, Dundee; Professor John Gibson, Edinburgh; Peter Boa, Edinburgh; David Brown Dott, Edinburgh; Jonathan Innes Fraser, Edinburgh; James Jack, Arbroath; Thomas Maben, Hawick; and John William Sutherland, Dumfries.

"The financial statement for the year, up to December, 1894, showing a total expenditure of £3114 12s., as compared with £1093 10s. 11d. for the previous year, has already been forwarded to the Council. The foregoing includes the exceptional expenditure of £1961 15s. for new buildings, and £53 5s. 9d. for expenses of reception at opening of Hall and laboratories in November.

"The following particulars indicate that the departments connected with the Branch continue in a satisfactory state:—

"*The Examinations.*—The Board has conducted the January and April examinations in the new Hall and Laboratories, and the Executive has pleasure in reporting that the new premises have been found admirably adapted for the convenient and efficient carrying out of this important part of the Society's work.

"Experience has suggested a few minor alterations and improvements, and a small committee of the Board of Examiners has been appointed to confer with the Chairman and Assistant-Secretary with a view to having these suggestions given effect to.

"There has been a decrease in the number of Major candidates, ten as compared with thirteen, but an increase in the percentage of passes, 60 per cent. as compared with 30·8 per cent. The number of Minor candidates shows an increase, 453 as compared with 395, and the percentage of passes also indicates a slight improvement, 42·17 per cent. as compared with 40·25 per cent.

"*Evening Meetings.*—The first evening meeting of the session took the form of a reception by the President and Council, and conversazione, at the opening of the new premises in November. It was attended by

upwards of 500 ladies and gentlemen, and was eminently successful. The ordinary evening scientific meetings have been continued, and have been attended with success. Two such meetings have been held, and a third has been arranged to take place on April 26. On account of the heavy extra work connected with the fitting up and arranging of new premises for examinations it was decided to have no evening meetings during December and January.

"It has been found that the New Hall is a great advantage for the holding of these meetings. The meeting held on March 22 would have more than twice filled the old Board room, where the meetings have hitherto been held.

"*Library.*—The Library continues to grow by the addition of new and standard books on pharmacy and the collateral sciences, mainly by purchase and a few as donations. The accommodation in the present library is now entirely taken up, and an extension has become imperative.

"It is proposed to obtain this by removing the Library to the old Board room on the second floor, which is well adapted for the purpose.

"The Library continues to be frequently consulted by university and extra-mural lecturers and others engaged in teaching science and in scientific research who cannot become members of the Society, and these have frequently expressed their high appreciation of the privilege.

"The number of volumes lent out during the year is seen from the following table:—

April 1894 to March 1895	1346
" 1893 " " 1894	1223

Increase 123

"The Library is also very largely made use of by members, associates, and students for purposes of reference. The circulation of books to provincial readers shows an increase. During the twelve months (1893-94) 114 volumes were circulated to readers outside Edinburgh and Leith. During the twelve months (1894-95) 130 volumes were so circulated, being an increase of sixteen. The Executive is still of opinion that this department of the Library's usefulness might be greatly extended with much advantage to members, associates, and students residing in the provincial districts.

"*Museum.*—The Executive has again to record thanks to several donors of interesting specimens, and some duplicate specimens have also been received from Bloomsbury Square. The students' specimens are in good order, but it is intended to make improvements in this department in connection with the proposed re-arrangement of the Museum after removal of the Library from the ground floor.

"The attendance at the Society's Museum and Library continues to keep up, and though no accurate record of the precise number can be given, it is estimated that about 3000 visited them during the year.

"There can be no doubt that there is a growing appreciation among Scotch pharmacists of the attention shown to them by the Council in providing

premises in Edinburgh, admirably equipped for the advancement of those interests represented by the Society.

"*House.*—The chief feature of the year in reference to the Society's House has been the completion and opening of the new premises, which are now well furnished and in good order. The other parts of the Society's premises it is proposed to rearrange, and a committee has been appointed to prepare a special report for the consideration of the Council.

"JAMES L. EWING, Chairman.

"Edinburgh, April 19, 1895."

The PRESIDENT moved that this report, which contained many interesting details, be received and entered on the minutes.

Mr. STORRAR said he believed the Society was very well served at the present time by the North British Executive, more especially, during the last two years, by the Chairman and Assistant-Secretary. He was desired on behalf of the North British Branch to thank the Council for the very complete and handsome manner in which the premises in Edinburgh had been finished. They had now a suite of rooms which for completeness and convenience were not even second to those in Bloomsbury Square, and he hoped they would be largely used, and by a higher class of candidates even than they had hitherto.

The resolution was carried unanimously.

THE SOCIETY'S EXAMINATIONS.

The PRESIDENT announced that the members would find on the table the report of Dr. Stevenson, the visitor to the Privy Council, on the Society's examinations in England and Wales, as follows:—

"*Report on the Examinations held by the London Board of Examiners of the Pharmaceutical Society of Great Britain during the year ending March 31, 1895.*

"To the Lords of the Council,

"My Lords,—I have to report that during the year ending March 31, 1895, I have attended twelve examinations of the London Board of Examiners of the Pharmaceutical Society of Great Britain.

First or Preliminary Examination.

	Numbers.	Percentages.
Candidates examined	1582	—
" who passed	726	46.5
" " failed	836	53.5
Failed in Latin	519	33.2
" " English	409	26.2
" " Arithmetic	791	50.6

"These figures, when compared with those of 1894, show that the failures have considerably increased, more especially in arithmetic. I have read many of the candidates' papers, and having compared the marks assigned to them by the Examiners with the standards adopted for 'pass' and 'rejection,' I am of opinion that a very moderate knowledge of the subjects of the examination will enable a candidate to pass. There are a very large number of candidates who present themselves at this examination of very defective education. One in six of the candidates failed in every subject. This examination is by no

means a severe one for youths, but unfortunately many of the candidates are, I believe, young men already engaged in the business of pharmacy.

Minor Examination.

	Numbers.	Percentages.
Candidates examined	1002	—
" who passed	865	86.4
" " failed	637	63.6
Failed in chemistry	283	28.2
" " materia medica	49	4.9
" " botany	78	7.3
" " pharmacy	221	22.1
" " prescriptions	53	5.3
" " practical pharmacy and dispensing	169	16.9
" " obtaining aggregate marks for a pass	71	7.1

"Here there is a slight increase in the percentage of passes. There have been considerable changes in the list of examiners, but judging from the results of the January examination, when the new examiners came into office, there has been no considerable change in the proportion of rejections. The introduction of those engaged in teaching chemistry, physics, and botany into the staff of examiners at this and the Major examination is, I believe, likely to work well and to the advantage of candidates, since there is no one so well fitted to examine and to gauge the knowledge of students as he who is engaged in teaching a science. I shall watch the further results of the change with interest.

"I can speak in high terms of the increased care and skill with which the examiners for the most part discharge their duties.

Major Examination.

	Numbers.	Percentages.
Candidates examined	139	—
" who passed	70	50.4
" " failed	69	49.6
Failed in chemistry	21	15.1
" " physics	12	8.6
" " materia medica	7	5.0
" " botany	10	7.2
" " practical work	10	7.2
" " obtaining aggregate marks for a pass ...	21	15.1

"Here, again, there is an improvement in the number of passes, and the scientific training of the candidates has evidently undergone an improvement. It is to be regretted, however, that so small a number of chemists and druggists present themselves for this examination, but content themselves with passing the Minor, which is the qualifying examination, and are content to remain apparently destitute of the higher knowledge demanded to enable them to assume the higher title of pharmaceutical chemist.

"I am, my Lords,

"Your obedient servant,

"THOS. STEVENSON,

"March 14, 1895."

"Visitor."

FINANCE REPORT.

The report of this Committee was read by the Secretary.

The PRESIDENT, in moving the adoption of the report, said the receipts, as was usual this month,

were somewhat larger than usual, members', associates', and students' subscriptions coming in to the extent of something like £1000. The Benevolent Fund was fairly well supported, their friends having sent in some £1800. Amongst the donations to this fund during the year was 25 guineas from the chemists' ball, a sum from a smoking concert at Liverpool, and 10 guineas from Mr. Waterall, of Nottingham, one of their old members, for which they all felt very grateful. The payments called for no special remark, except that the expenses both of the College of Preceptors and of the technical examinations were included in the account. The Orphan Fund remained practically as it was.

The report was agreed to unanimously.

BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to a registered chemist and druggist (60) who had failed in business, and has since been acting as assistant, but is now out of employment. (Bristol.)

£10 to the widow (81) of a pharmaceutical chemist member, who is dependent on her son, who has a wife and family. (Bristol.)

£5 to the widow (51) of a registered chemist and druggist, who has had four previous grants amounting to £35. (Redhill.)

£20 to a registered chemist and druggist (71) for eight years a subscriber, and formerly a local secretary. Suffering from failing sight and ill-health. (London.)

£5 to a former associate and subscriber (40). Is in difficulties owing to his wife's ill-health. Has had three previous grants of like amount. (London.)

£10 to a former associate (76), who has had three previous grants of a like amount. (Croydon.)

£10 to the widow (71) of a registered chemist and druggist, who has had eight previous grants of £10 each. Is unable to earn anything. (Birmingham.)

£10 to the widow (45) of a chemist and druggist member. Applicant had a grant of £10 in 1891, since when she has supported herself. She has two children (girls) to support. (Thornton Heath.)

£10 for the benefit of the orphan children of a registered chemist and druggist who died in January last, and his wife soon afterwards. The eldest supports herself, and the two next, who have been ill, hope shortly to obtain situations. (Edinburgh.)

£15 to a chemist and druggist member and subscriber who was in business for thirty-three years, but had to dispose of it in January last owing to ill-health, and now has no means. (Newport, Mon.)

One application was deferred for further information, and four others were not entertained.

The SECRETARY reported the death of Geo. Cheetham, an annuitant, aged 82, on April 16.

The VICE-PRESIDENT, in moving the adoption of the report, said it was very satisfactory to find, as the President had said, that the subscriptions were coming in well, for it was quite evident from the present report that a good deal of money was re

quired, no less than a hundred guineas having been voted, subject to the approval of the Council, this month. It was not desirable generally to deal with the cases in detail, but he could not forbear mentioning one case from Scotland which was of a truly heartrending character. It was that of a family of eight persons living in Edinburgh who spent a happy Christmas together, and before last quarter-day four of them had been removed by death. The father came to Edinburgh about thirteen years ago, and he died in March last of consumption, probably brought on by the troubles he had undergone. Previously to that the eldest son, who had just come of age, died, after very great suffering. He had an accident when a boy, which resulted in hip disease, and that progressed until at the time of his death he had lost both legs and one of his arms. He died in January. In March the father died; a few days afterwards the youngest child was attacked with croup, was taken to the hospital, and died before her mother could be summoned, and three days afterwards the mother died also. In the meantime two other girls were taken with scarlet fever, and were removed to the infectious ward of a hospital, where, happily, the eldest sister was engaged as a nurse, and through her devotion and skill they were now, happily, convalescent. He need hardly say that this case excited a great deal of sympathy in Edinburgh, and no doubt assistance would be forthcoming; but it was very satisfactory to think that the Benevolent Fund was able to step in and give some immediate relief in such a distressing case. Even at the risk of being tiresome, he begged again to call attention to the case of Mary Margaret Lewis, who was a candidate for the Welsh Girls' School. He had received an intimation that Alderman Vaughan Morgan had interested himself in the case, and also Mr. Octavius Morgan, late M.P. for Battersea, and many votes had been secured, so that he hoped those who had interested themselves in the case would be encouraged to go on.

Mr. JOHNSTON said from personal knowledge he would like to say that their Vice-President had very correctly represented the facts of this sad case. For himself he felt proud that Scotland rarely applied to the Society for relief; but he was not less pleased that when a deserving case did come up it was met in the spirit shown on this occasion. He had no doubt friends would be found to do what was possible for these two orphans, and he trusted that what the Society had done would quicken their sympathies, and open the hearts as well as the pockets not simply of those outside the Society but also of their members.

Mr. YOUNG said he should like to emphasise Mr. Johnston's closing remark in view of their income being rather diminishing than increasing. Just now, he must admit, the prospects of business were not too rosy, and the present terrible competition they must expect, he feared, to become more intensified rather than the reverse. Perusing some of the many prospectuses with which one was now flooded he had noticed the absence of all provision in them of anything approaching superannuation to those who would

grow old in the service. He feared therefore that they must expect with, as he had said, a diminishing income, even an increase of applications for grants, and he did therefore hope that many who were very well able to do so would contribute in large numbers and more liberally to this Fund.

The report and recommendations were unanimously adopted.

REPORT OF THE RESEARCH COMMITTEE.

This report was as follows:—

"The Research Committee has held meetings once a month during the past year, at which the Director has made periodical reports on the work of the Research Laboratory.

"Mr. H. A. D. Jowett, B.Sc., Lond., has been appointed to succeed Mr. E. F. Harrison as Demonstrator, and Mr. Francis H. Carr has been elected Salters' Research Fellow in Chemistry by the Court of the Salters' Company.

"There has been a considerable increase in the number of applications for admission to the Laboratory during the past year. The total number of workers during the session has been fourteen, the highest number yet recorded, whilst at the present time there are eleven persons at work, so that every bench in the Laboratory is now occupied.

"Some of the workers are engaged in preliminary operations, others are occupied in special pharmacological and chemical enquiries.

"Considerable progress has been made in connection with the investigation of the aconite alkaloids, several new inquiries having been started.

"With the object of throwing further light on the new constitution for aconitine which resulted from the work of the laboratory last year, a number of derivatives of the alkaloids of *A. napellus* have been prepared and their properties investigated, so that the constitution of aconitine and its relationship to the other alkaloids, which, up to the present, have been established by a very definite line of analytical evidence, may be substantiated by synthetical proof. So far, however, no very conclusive results have been obtained from these synthetical experiments, but they have led to the production of a number of new compounds, whose chemical properties and physiological action are of considerable interest.

"Simultaneously with this work the physiological action of the alkaloids—aconitine, benzaconine, pyraconitine, aconine, and their derivatives—has been investigated by Professor Cash, F.R.S., with highly purified specimens specially prepared for the purpose.

"A long series of experiments has also been carried out in the hope of devising an accurate method of estimating aconitine in the presence of the other aconite alkaloids. Great difficulties have been encountered in this work, but it is hoped that eventually a satisfactory conclusion may be reached. Progress has also been made with the isolation and examination of the alkaloids contained in two other species of aconite, viz., Japanese aconite and the *Aconitum heterophyllum* of India, and in these cases also the physiological action of the pure substances will be determined.

"In connection with this work on the aconite alkaloids, the Committee wish to acknowledge the great assistance which has been rendered to the inquiry by the Royal Society through a grant from the Government Fund towards the expenses of the chemical and physiological experiments. Without this pecuniary assistance, which has now been rendered by the Royal Society during three successive years, it would not be possible to continue this costly investigation.

"Several other enquiries, having chiefly pharmacological interest, have been conducted during the past year. At the suggestion of the Director of the Royal Gardens, Kew, an examination has been made of the active constituents of a medicinal plant growing in Trinidad—*Piper ovatum*. A crystalline substance named piperovatine has been obtained and its chemical properties described, whilst its physiological action has been investigated by Professor Cash. The similarity between the physiological action of this drug and that of the well-known pellitory of medicine led to an examination of this plant, with the result that a crystalline, highly active substance, closely resembling piperovatine, has been isolated.

"At the suggestion of the Director of the Imperial Institute (Sir Frederick Abel), who kindly supplied the material, an investigation has been made of the constituents of *Podophyllum emodi*, which is abundant in India, and is regarded there as a possible medicinal substitute for the American *Podophyllum peltatum*, which is now so extensively employed. It is intended to isolate the constituents of both these drugs and to compare their chemical properties, and also their therapeutical effects. Progress has already been made with this work.

"The increase in the number of workers has considerably augmented the expenses of the Laboratory.

The statement of the receipts and expenditure for the year shows a credit balance of £14 3s. 3d.

"The results of the year's work have so far been published under the following titles:—

- 'The Action of Iodine and of Methyl Iodide on Aconitine,' by Professor Dunstan and Mr. H. A. D. Jowett.
- 'Acetyl Derivatives of Aconitine and Benzaconine,' by Professor Dunstan and Mr. F. H. Carr.
- 'Aconitine Aurichlorides,' by Professor Dunstan and Mr. Jowett.
- 'The Constituents of *Piper ovatum*,' by Professor Dunstan and Mr. Henry Garnett.
- 'The Active Constituent of the Pellitory of Medicine,' by Professor Dunstan and Mr. Garnett.
- 'The Action of Methyl Iodide on Hydroxylamine,' by Professor Dunstan and Mr. Goulding.
- 'Formaldoxime,' by Professor Dunstan and Dr. Bossi.
- 'The Reduction Products of Nitro Compounds,' by Professor Dunstan and Mr. Dymond.
- "The expenses of the three last-named investiga-

tions have been defrayed by a grant from the Chemical Society.

- "M. CARTEIGHE, *President*.
- "W. G. CROSS, *Vice-President*.
- "T. GREENISH,
- "G. F. SCHACHT, } *Members of Council*.
- "T. LAUDER BRUNTON,
- "CHARLES EKIN,
- "E. FRANKLAND,
- "M. FOSTER, } *Additional Members of the Committee*.

"March 5, 1895."

The PRESIDENT formally moved that this report be received and entered on the minutes.

Mr. MARTIN said he must repeat what he said last year, that he deplored that the work of the Research Laboratory had so little bearing on medicine. There had been three further papers on aconitine, three on purely chemical subjects, which had but very slight bearing on medicine, and two only on subjects distinctly medical, viz., on substances sent for examination from the Royal Gardens at Kew and from the Imperial Institute. He was glad to see that this had been done, but with regard to the purely chemical papers he must emphasise what he said before. He did not object to any students obtaining any amount of *kudos* for what they did in the laboratory, on the contrary, the more they got in a legitimate way the better; but he did object to subjects being taken up for the mere sake of *kudos*. There were problems almost innumerable yet to be worked out in connection with medicine. Last year he referred to the subject of ipecacuanha, and an exceedingly good paper had been published upon it, not as the result of work in the Research Laboratory, but by private individuals—Dr. Paul and Mr. Cownley. The Research Laboratory might have taken this up at any time, and so with regard to ergot and many other drugs which required investigation. A new pharmacopœia was on the eve of being published, but after seven years' work he feared the Research Laboratory would be able to contribute very little to its pages.

Mr. MARTINDALE said the report, which was dated March 5, stated that there were eleven students; he understood that now there were ten, and that of those three or four were foreigners, and only six pharmaceutical chemists, for whom the laboratory was specially intended.

The PRESIDENT said he only knew of one foreigner, and no pharmaceutical chemist had been excluded to make room for an outsider. The foreign gentleman referred to was of very great assistance in the laboratory, and not the least so to pharmaceutical chemists who came there without any previous experience of research work. The Committee would be glad to see twelve pharmaceutical chemists there, and he might add that anyone from outside who came in for a short time to do special work paid the cost of materials used.

Mr. BOTTLE said the financial statement attached to the report was rather confusing, or at any rate was beyond his comprehension. It contained a statement that £300 had been granted by the Council and by the Royal Society, but when he referred to the financial statement of the Society he found £400 6s.

charged to the Research Laboratory. Then, again, there was a statement that the expense of certain investigations had been defrayed by a grant from the Chemical Society, but he saw no mention of such a grant in the financial statement. In February, 1891, there was a minute to the following effect:—"That the direction of the Research Laboratory shall constitute a part of the regular duty of the Professor of Chemistry, and that he shall ask authority and receive instructions from the Council, and not, as hitherto, from the Committee, but it appears desirable that the general control of the laboratory should be, as at present, vested in the Research Committee." He certainly thought the question of allowing the Research Laboratory to be used for the purposes of the Chemical Society should have been brought before the Council, but he had no knowledge of it ever having been done.

Mr. GOSTLING said he agreed to a considerable extent with Mr. Martin, that the work done was not that which was required. It occurred to him that it would be far better if the resolution which Mr. Bottle had read were acted on, and a report presented to the Council each month from the Research Committee, so that they might know more of what was going on.

The PRESIDENT said in the financial statement of the Society the grant to the Research Laboratory and the Director's salary were put together; there was also an extra grant of £50 for a special purpose. The period covered by the two statements was not identical, which introduced another difficulty, and the grant from the Royal Society was paid direct to the Research Committee. With regard to the special chemical paper, a grant was made to Professor Dunstan by the Chemical Society, and he asked the Committee whether they would like the name of the Research Laboratory used in connection with it, and it was thought desirable that it should be so connected; otherwise Professor Dunstan would have carried out the investigation himself, as all professors were entitled to do when it did not interfere with their ordinary duties, and the result would have simply had his own name connected with it.

Mr. MARTIN asked if the Research Committee thought it consistent with its duty to place the laboratory at the disposal of anyone to conduct researches for another society without any control over it. He did not think that was the purpose for which the laboratory was equipped and endowed.

The PRESIDENT said the professor of chemistry in every institution was entitled to do work of his own, and this was a case of that sort. It was not done for the Chemical Society.

Mr. STORRER observed that in the Society's financial statement the Research Laboratory was put down for £400 in one sum without any details; could not the details be given?

The PRESIDENT said the £400 included the sum paid to the Director as salary, and also the £150 grant and the £50 special grant. It was not desirable to go too much into detail in a financial statement. This was prepared and approved by the Finance Committee.

Mr. BOTTLE asked if there had been any further

grant from the Royal Society. It was currently reported that argon was being investigated in the Research Laboratory, and he should like to know if this were a fact.

The PRESIDENT said he had not heard of it.

The motion was then put and carried unanimously.

THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
March	{ Day . .	536	28	13	21
	{ Evening .	180	16	4	9
Circulation of Books.					
	Total.	Town.	Country.	Carriage paid.	
March	189	108	81	17s. 4½d.	

Donations to the Library had been announced (*Pharm. Journ.*, April 6, p. 874), and the Committee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended the purchase of the undermentioned book for the Library in London:—

Benedikt and Lewkowitsch, Chemical Analysis of Oils, Fats, and Waxes, 1895.

Museum.

The report of the Curator had been received, and included the following particulars:—

	Attendance.	Total.	Highest.	Lowest.	Average.
March	{ Morning	589	57	9	24
	{ Evening	42	7	1	2

Donations to the Museum had been received (*Pharm. Journ.*, April 6, p. 874), and the Committee had recommended that the usual letters of thanks be sent to the respective donors.

The PRESIDENT, in proposing the adoption of the report, said it contained nothing special to which he need direct attention, and it was thereupon put and carried.

INVESTMENT OF FUNDS.

The PRESIDENT said several "parcels" of ground rents were now in view, and he proposed, as there was no existing committee to deal with the subject, that the President, the Vice-President, the Treasurer, and Mr. Hills, with the assistance of Mr. Butt, should be appointed a Freehold Investments Committee, with power to take all necessary steps to purchase suitable ground rents when opportunity occurred.

This was at once agreed to.

A "SOOTHING SYRUP" FATALITY.

The PRESIDENT said a communication had been received from the Privy Council, enclosing a copy of a letter addressed to the Home Office by Mr. Hulme, coroner, of Worcester, with reference to a death, found by a jury to have resulted from the taking of "Mrs. Winslow's Soothing Syrup." The inquest was held on a boy thirteen months old, and the evidence was to the effect that two doses, one of a teaspoonful and the other of half a teaspoonful, of Mrs. Winslow's Soothing Syrup were given to the deceased, and that he died from the effects of the morphine contained in

such syrup. The advertisement on the syrup stated that it contained only one-eighth of a grain of morphine to the fluid ounce, but the analysis made by Mr. Ross, the public analyst for Northampton, disclosed that it contained one grain to the fluid ounce. The jury, in their verdict of death from morphine poisoning, added that, in their opinion, the sale of preparations containing so dangerous a drug as morphine was most strongly to be condemned, and ought not to be allowed except under proper restrictions. The letter had been acknowledged by the Secretary, and the coroner would, through the Home Office, be informed that the provisions of the Pharmacy Act applied to such preparations.

REPORT OF EXAMINATIONS.

April, 1895.]

England and Wales.

Candidates.	Major	Minor.	Total.
Examined.....	32	240	272
Passed	12	63	75
Failed	20	177	197

Scotland.

Examined.....	3	121	124
Passed	8	52	55
Failed	0	69	69

First Examination.

Examined	394
Passed	189
Failed	205

Thirty Certificates were received in lieu of the Society's examination.

The above report having been presented, Mr. ATKINS said he was much struck by the figures; it seemed as if the proportion of failures was increasing.

Mr. YOUNG thought if the stringency of the Preliminary examination were increased it would have a beneficial effect on the Minor.

The PRESIDENT said it would be seen that Dr. Stevenson referred to that in his report; but he did not lay so much stress on increased stringency as on the Preliminary being passed at the proper time. Men prepared for the Preliminary and passed at the age of, say, 23 or so were no good. That was the real root of the difficulty. No doubt the examination ought to cover a wide area, and to represent more completely than it did what might be called an ordinary school training. But even as it was it would be a material benefit if it were passed at the right time. He thought a little algebra and geometry almost essential, and for himself should be glad if the Society could get rid of the First examination altogether, and rely entirely on certificates, to be granted by ordinary examining bodies.

Mr. ATKINS said he hoped the matter would receive further attention. It was an ancient story, but worth repeating, that years ago some of them urged the importance of insisting that the Preliminary examination, or its equivalent, should be passed before apprenticeship. It had been said there were practical difficulties in the way. He did not know what they were, but he was certain many entered on the business thoroughly unprepared. He was sorry to say that the old method of apprenticeship was rapidly disappearing. He could recollect when apprenticeship involved a large responsibility on the part of the master, and he deeply regretted being impressed with the conviction that the old conditions had disappeared. Now it was merely a question of pupillage out of the house, and simply having the run of the place. The result was that they no longer had the style of man they once got. They might have a higher scientific training, but they did not get the training at the counter which was imparted under the old system.

ACKNOWLEDGMENT BY A CORRESPONDING MEMBER.

The PRESIDENT read a letter from one of the Society's corresponding members, Mr. Rudolf Kobert, of Dorpat, forwarding as a slight acknowledgment of his election as corresponding member the 11th and 12th parts of the "Arbeiten des Pharmakologischen Institutes zu Dorpat."

COMPULSORY EARLY CLOSING.

The PRESIDENT next read a letter from the hon. sec. of the Plymouth, Devonport, Stonehouse, and District Chemists' Association, enclosing a resolution passed at a quarterly meeting, approving of chemists being included in Sir J. Lubbock's Compulsory Early Closing Bill, provided a clause be inserted allowing medicines to be dispensed in cases of emergency. Perhaps this letter had better be referred to the Parliamentary Committee.

Mr. HAMPSON said he did not object to the reference, but he would take the opportunity of strongly protesting against this kind of legislation and interference with the business of people. Their trade was, of course, out of the ordinary groove. For his part he saw no reason for the State interfering and telling them when they should shut and when open their shops.

The PRESIDENT said he would remind the Council that when this subject was last formally before them he was instructed to oppose the Bill so far as chemists and druggists were concerned. The opposition, he had reason to know, was not confined to themselves, and perhaps he might hope that an outcome of it would be an amending clause.

The letter was referred accordingly.

PRELIMINARY EXAMINATIONS.

The PRESIDENT said a letter had been received from the Registrar of the Pharmaceutical Society of Ireland asking this Council to accept the preliminary examination of that Society in lieu of the preliminary here, and enclosing a syllabus showing that practically the Irish examination embraced all the subjects included in the English.

On the suggestion of the PRESIDENT it was resolved to refer the communication to the Board of Examiners for consideration and report.

Mr. ALLEN agreed with Mr. Atkins. He took a great interest in this question, and had done so since he was an apprentice himself. He was satisfied that most of the failures were owing to the lack of preliminary training. Men in business should make it a *sine qua non* with every apprentice that he should have passed the Preliminary examination, for without that he was not in a position to take advantage of the technical instruction his master could give him.

Mr. GROSE suggested that the difficulty would be got over to a great extent by requiring the Preliminary examination to be passed at least three years before the candidate presented himself for the first portion of the Minor. Many men now occupied their leisure time during their apprenticeship in preparing for the Preliminary, and having passed that in the autumn presented themselves for the Minor in the early part of the next year.

The PRESIDENT said Mr. Grose had probably forgotten that a clause had been included in several draft Bills providing for the division of the Minor examination. It was held at present that the Preliminary examination was a part of the Minor, and though an interval of three months had been imposed between the Preliminary and the Minor it was not considered possible to go any farther at present.

The VICE-PRESIDENT said he was very glad to hear what had been said about the passing of the Preliminary before apprenticeship, and he was glad to say that schoolmasters were becoming aware of the necessity of that course being followed, and were in the habit of asking their pupils what their future course would be, and if they were going to be chemists, of suggesting that they should pass the Preliminary examination immediately on leaving school. He hoped therefore that in the future there would be an improvement.

DIVISIONAL SECRETARY.

The PRESIDENT said he had to report with much regret the rather sudden death of Mr. Fitch, Divisional Secretary for Hackney. He was a man of considerable capacity, and at the various meetings of Divisional Secretaries no one had given more assistance to the general discussion than Mr. Fitch. He moved the election in his place of Mr. Nichols, 99, Wick-road, South Hackney.

The proposition was at once agreed to.

GENERAL PURPOSES COMMITTEE.

The portion of the report of this Committee dealing with the school prize examinations having been read, the President moved that upon it the following awards be made :—

Practical Chemistry.

Bronze Medal Francis F. A. Tunbridge.
Certificates of Honour ... { Arthur Lilly.
 { Robert Edwin Wright.

Chemistry and Physics.

<i>Bronze Medal</i>	Francis F. A. Tunbridge.					
<i>Certificates of Honour</i> ...	<table> <tr> <td>Harold Brown.</td> <td rowspan="3">} Equal</td> </tr> <tr> <td>Montague Cashmore</td> </tr> <tr> <td>Harold Read</td> </tr> </table>	Harold Brown.	} Equal	Montague Cashmore	Harold Read	
Harold Brown.	} Equal					
Montague Cashmore						
Harold Read						

Botany.

Bronze Medal Harold Brown.
Certificates of Honour ... { John Robert Walker.
 Dingley Palmer Fuge.

Materia Medica.

Bronze Medal Harold Brown.
Certificate of Honour..... John Robert Walker.
Pharmacy and Practical Pharmacy.
Bronze Medal John Robert Walker.
 The proposition was unanimously agreed to.

RESEARCH COMMITTEE.

The Council having gone into committee to consider the subject of the Research Laboratory, as the result of the discussion it was resolved, on the motion of Mr. Harrison, seconded by Mr. Storrar, "That it is desirable the subject of the Research Laboratory be fully considered at an early date by the incoming Council of the Society."

ANNUAL REPORT.

A draft of the annual report was adopted and ordered to be published in the *Pharmaceutical Journal* (see page 993).

LEGAL PROCEEDINGS.

The legal portion of the report of the General Purposes Committee was considered in committee, and, on resuming, the report and resolutions were unanimously adopted, and special resolutions were passed authorising the Registrar to take proceedings against the persons named in the report.

Proceedings of Societies in London.

CHEMICAL SOCIETY.

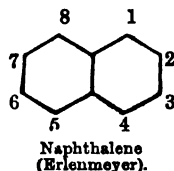
A meeting was held on Thursday, May 2, 1895, the President, A. Vernon Harcourt, F.R.S. in the chair.

The following papers were read:—

STUDIES OF THE TRI-DERIVATIVES OF NAPHTHA-
LENE; THE COMPLETE SERIES OF FOURTEEN
TRI-CHLORO-NAPHTHALENES, BY DR. H. E. ARM-
STRONG, F.R.S., AND DR. W. P. WYNNE.

At the commencement of an investigation undertaken on the action of sulphuric acid on naphthalene and its derivatives, and the properties and reactions of certain isomers, it was found that the state of our knowledge concerning the di- and tri-chloro-naphthalenes was both incomplete and in many cases unreliable. An investigation was then undertaken of the di- and tri-chloro-naphthalenes, and in 1890 an account was given of the whole series of ten dichloro-naphthalenes, and since then the corresponding complete series of fourteen tri-chloro-naphthalenes have been prepared, and their physical properties and reactions studied, and specimens of both complete series were exhibited at the meeting.

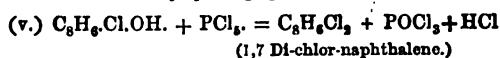
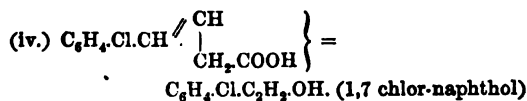
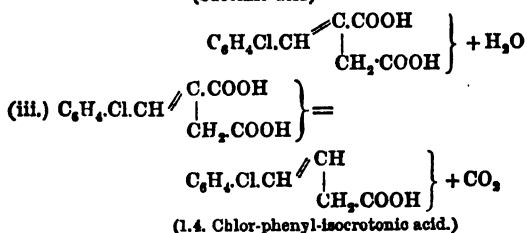
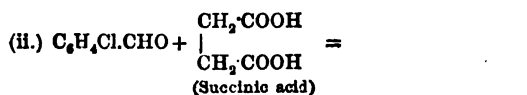
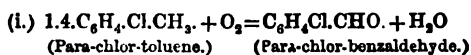
If Erlenmeyer's formula for naphthalene be correct, then there should be ten isomeric di-chloro-naphthalenes where the halogen takes up various positions as 1, 2; 1, 3; etc., and also fourteen isomeric tri-chloro-naphthalenes, such



as 1, 2, 3 : 1, 2, 4 : etc.

This exact number of isomers has been obtained, and all attempts to increase the number failed, thus affording very strong proof of the correctness of Erlenmeyer's formula.

Dealing first with the di-chloro-naphthalenes, it was found that if all the derivatives previously described were different isomers, then twelve di-chloro-naphthalenes were known, and hence it was necessary to repeat the work of previous observers in order to find out whether or no the number must be reduced. The di-chloro-naphthalenes were first studied by Erdmann, who used the following method of preparation:—From a chlor-toluene of known constitution the corresponding chlor-benzaldehyde was produced by oxidising the methyl group to the aldehyde group (CHO). The chloro-benzaldehyde was then converted into the corresponding phenyl-isocrotonic acid or lactone by Perkin's synthesis of treatment with succinic acid in presence of potassium acetate, and the lactone thus obtained by heating loses water and suffers condensation, yielding a naphthol. The hydroxyl group is then replaced by chlorine, either by treatment with phosphorus pentachloride, or diazotisation. Taking the case of 1,4 chlor-benzaldehyde, the following equations represent the formation of the corresponding di-chloro-naphthol:—



Erdmann prepared several isomers by this method, and relied on the method of formation as proof of the position of the halogens. It is possible, however, that during these reactions an intra-molecular change occurs, and thus the proof of the position of the halogens in di-chloro-naphthalene is incomplete. The authors used different methods for their proofs, such as the formation of tri-chloro-derivatives by sulphonation and subsequent chlorination, a method similar to that employed by Baeyer in his investigations on the haloid derivatives of benzene. In this way the ten isomers of di-chloro-naphthalene were identified.

Up to 1885 most of the work done on tri-chloro-naphthalene had been done by Aléne, Atterberg,

Cleve, and other Swedish chemists, and several different isomers had been prepared and described, but very little was known as to the position of the haloid groups in the molecule. In 1890 the authors added five new isomers to those already described, but at the same time showed that two isomers previously described were identical, thus leaving only one isomer out of the fourteen possible isomers to be prepared.

The tri-chloro-derivatives were prepared by several different methods, and in most cases the position of the chlorine atoms in the molecule was determined by two or more independent methods, so that no doubt was left regarding the position of the haloid groups in the different isomers.

In some cases the di-chloro-naphthalene of known constitution was sulphonated by treatment with sulphuric acid, and the resulting chloro-sulphonic acid chlorinated by treatment with phosphorus pentachloride, or a naphthylamine sulphonic acid of known constitution was used as a starting point, and the groups replaced by chlorine by general methods.

The missing 1, 2, 8 tri-chloro-naphthalene (see formula above) was prepared by Erdmann's method from di-chloro-benzaldehyde ($\text{Cl.C}_6\text{H}_4\text{CHO} = 1,2,5$). Thus the whole series of fourteen isomers were prepared, their physical properties as M.Pt., crystalline form, etc. examined, as well as their behaviour on sulphonation.

In 1890, however, Cleve also prepared the missing 1, 2, 8, isomer by nitrating the chloro-naphthalene sulpho-chloride ($\text{C}_{10}\text{H}_6\text{Cl.SO}_2\text{Cl}$) and then distilling the product with phosphorus pentachloride, and obtained a body of different M.Pt. to that described by the authors. The question of this apparent discrepancy was investigated by the authors, who found that Cleve's method of preparation as a proof of the position of the haloid groups was unreliable. When the nitro-chlor-naphthalene sulpho-chloride [$\text{C}_{10}\text{H}_5(\text{Cl})(\text{SO}_2\text{Cl})(\text{NO}_2)$] is distilled with phosphorus pentachloride, an intramolecular change takes place. If, however, the nitro (NO_2) group be first reduced to amidogen (NH_2) and then the substance distilled with phosphorus pentachloride, a derivative is obtained identical with that obtained by the authors.

In the case of distillation of the sulpho-chloride and apparent replacement of (SO_2Cl) group by chlorine by means of phosphorus pentachloride, it is probable that this is not a case of displacement but of simple loss of sulphur dioxide (SO_2), the chlorine atom in the tri-chloro-naphthalene obtained being not derived from phosphorus pentachloride, but from the (SO_2Cl) group. It is found that heating alone brings about this change, so that phosphorus pentachloride merely acts as a catalytic agent.

In several isomers cases of dimorphism occur—compounds are obtained differing only in melting point, crystalline form—and this property was found to be generally associated with isomers having the chlorine atoms in the position 2, 5. The formation of these di-chloro-naphthalenes and tri-chloro-naphthalenes thus affords almost conclusive evidence of the correctness of the formula proposed by Erlenmeyer, and the later one proposed by Claus must therefore be abandoned.

THE SOLUBILITIES OF GASES IN WATER UNDER
VARYING PRESSURES.

BY E. P. PERMAN, D.SC.

The methods used for determining the absorption coefficient of various gases have been of two types.

(i.) Bunsen's method depending on the measurement of diminution of volume of the given gas after shaking with a known volume of the solvent.

(ii.) Hufner's method consisting in the preparation of a saturated solution of the gas, and then pumping out the gas from solution and measuring it.

The apparatus used by the author dependent on aspiration by a current of air through a saturated solution of the gas and measurement of the gas removed at definite intervals of time.

A saturated solution of the gas was placed in a flask kept at a constant temperature, and through this a current of moist air aspirated at a regular rate, and the quantity of gas removed determined at definite intervals. The results were tabulated as a curve with the quantity of gas removed and the time of aspiration as co-ordinates; from this curve a new curve was deduced with pressure and concentration as co-ordinates.

Now, if the law of Henry for solubility of gases at different pressures holds good, the pressure-concentration curve will be a straight line, if not, it will be a curve. The quantity-time curve is logarithmic and is always curved. Experimenting in this way, it was found that solutions of ammonia, sulphur di-oxide and hydrogen chloride in water do not obey Henry's law, but chlorine, bromine, carbonic anhydride, and hydrogen sulphide obey Henry's law, these results thus confirming those previously obtained by other observers.

THE EXISTENCE OF HYDRATES AND OF DOUBLE
COMPOUNDS IN SOLUTION.

BY E. P. PERMAN, D.SC.

The author endeavoured to apply the method above described to determine whether salts exist as hydrates in solution. If a crystalline salt as sodium sulphate exists in solution as a hydrate (Pickering), there would be no change in concentration on solution, but if these hydrates do not exist and solution be due to dissociation (Arrhenius), then the addition of this salt would cause a difference in the concentration. If a gas be dissolved in such a solution, the quantity dissolved will depend—*ceteris paribus*—on the amount of water present. It was found that on dissolving crystalline sodium sulphate no such change occurred, thus supporting the hydrate theory of solution. When anhydrous sodium sulphate was dissolved a difference in the concentration was shown by the curve of pressure-concentration, proving that the anhydrous salt forms a hydrate and thus alters the concentration.

The following paper was taken as read: "Note on the Formation of Platinic Pyrophosphate," by R. E. Barnett.

CHEMISTS' ASSISTANTS' ASSOCIATION.

The annual general meeting of this Association was held on Thursday, May 2, the President, Mr. R. H. Jones, in the chair.

After the minutes of the previous meeting had been read and confirmed, Messrs. Chaston and Dyson were appointed scrutineers of the voting papers for the Council of the session 1895-96, and Messrs. A. J. Bellamy and W. G. Crouch to audit the balance-sheet.

Whilst this business was being transacted, the President announced that arrangements had again been made for a series of Sunday excursions during the summer months, the first being fixed for the 12th inst., Dorking being the destination. With reference to the prizes offered by the Association and Burroughs, Wellcome and Co., he regretted that the Council were unable to make any award in either instance. He then called upon Mr. C. Morley to read

THE ANNUAL REPORT.

In this the Council congratulated the members upon the highly successful session which was now at its close. During the past year 16 new members had been elected, making the present number 148, whilst the number of patrons was 48, the same as at the close of last session. During the year sixteen papers on scientific and trade matters had been read and discussed at the evening meetings, and in addition two discussions on topics of direct trade interest had been held. Several musical and social evenings had also proved great attractions. The conversazione, for the conspicuous success of which they were greatly indebted to the Vice-President, Mr. H. H. Robbins, was held last November, and an innovation in the shape of a smoking concert at the Horse Shoe Hotel had more than justified their expectations. Allusion was made to the fact that the work sent in by competitors for the essay prize and the prize for practical work did not justify an award in either instance. The attendance both at the evening meetings and at the annual dinner, which was again held at Cannon Street Hotel in March, Mr. Walter Hills occupying the chair, had been extremely satisfactory. The financial position of the Association was exceptionally good, and the proceeds of the sale of programmes at the smoking concert and social evenings had been handed over to the Benevolent Fund of the Pharmaceutical Society.

In moving the adoption of the report the President commented briefly upon its gratifying nature, and stated that the decision of the Council with respect to the non-award of the prizes had been arrived at after careful deliberation, and they were of opinion that the competitors had not done themselves justice. He expressed the hope that in the next session work would be produced which would be worthy of the essayists and the Association itself. Mr. H. H. Robbins having briefly seconded the motion, it was carried unanimously.

The balance-sheet was then read by Mr. C. J. Strother, Hon. Treasurer. He expressed his great satisfaction in having to announce a balance of

£67 19s. 7½d., as against £38 7s. 11½d. last year, this being the largest that had been declared since the formation of the Association. The President in moving the adoption of the balance-sheet, acknowledged the indebtedness of the Association to their financial secretary, Mr. E. W. Hill, for their flourishing position, as it was through his instrumentality that the rent of the rooms had been considerably reduced. In addition, the donations had been considerably in excess of past years, and arrangements had been made by which the sum received for the publication of reports was much larger than last year. Mr. Hill seconded the motion, and it was unanimously adopted.

The scrutineers now handed in their report of the Council voting papers. Seventeen members had been nominated, of whom fourteen were elected. Fifty-five voting papers had been received, all of which were valid. The candidates received the undermentioned number of votes:—R. H. Jones, 53; E. W. Hill, 51; C. Morley, 51; R. G. Guyer, 49; R. Melhuish, 49; C. J. Strother, 48; E. Umney, 48; W. Moore, 47; H. H. Robbins, 45; W. R. Roberts, 45; A. Gunn, 39; G. Roe, 37; W. G. Crouch, 32; T. M. Taylor, 32. The votes for the unsuccessful candidates were:—T. Tickle, 29; W. Anderson, 26; T. A. Elwood, 21.

The President then read his

VALEDICTORY ADDRESS.

In the course of his remarks he stated that the Association could look back with particular satisfaction on the work of the past session, inasmuch as the vexed question of Sunday excursions a year ago threatened to do serious injury to its stability. He was glad to say that the split, which had caused several members to sever their connection, had not affected the well-being of the Association, in fact it was at the present time on an unprecedentedly satisfactory basis.

He had a few suggestions to make on taking leave of the Association in his presidential capacity, which were partly his own and had partly arisen from discussions with other members. It was important that four additional evenings during the ensuing session should be devoted to social gatherings. On one occasion a smoking concert might be held, and on the other three Cinderella dances should be organised. He did not doubt these would all prove exceedingly popular, and attract a considerable number to join the Association. As matters at present stood, it was practically impossible to get sufficient good men from their own ranks to read papers which embodied really first-class work before the Association, and it was necessary on some occasions to go outside, as they had done in the past session with conspicuous success. He alluded to the extreme difficulty experienced in getting members to contribute on the evenings devoted to short papers, and to counteract this he suggested the publication of a blue list, drawn up in unpretentious fashion, which would encourage members to bring forward subjects of interest. He hoped to see the strictly scientific work of the Association much im-

proved during coming sessions, and was of opinion that if modifications were introduced on the lines he had suggested the Association would present advantages to its members of an entirely exceptional character.

On vacating the chair he wished to express his indebtedness to the two honorary secretaries, Messrs. Hill and Morley, who had thrown themselves heart and soul into the work of the Association, and had much lightened his own work, and also to Mr. Robbins for the great assistance he had rendered in carrying out their social arrangements.

At the conclusion Mr. Hill proposed and Mr. Strother seconded a very hearty vote of thanks to Mr. Jones for the courteous and dignified manner in which he had filled the chair during the past session. This was carried with acclamation, and Mr. Jones having briefly responded, the proceedings terminated.

Scottish Transactions.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.

The annual business meeting of the seventeenth session was held in the Pharmaceutical Society's Hall, 36, York Place, Edinburgh, on Friday, May 3, at 9.15 p.m., Mr. Alexander Sutherland, President, in the chair.

The minutes of last meeting were read and approved.

The Secretary read the report of the Prize Committee on the "Ewing" Pharmacy Prize Competition, and in the unavoidable absence of Mr. Ewing, the President presented the prizes as follows:—Ewing Pharmacy Prize to William Makepeace Look, 20, Queensferry Street (Cooke's 'Anatomy,' Craig's 'Materia Medica,' and Huxley and Martin's 'Practical Biology'; and Mr. Aitken's Prize to John Robert Thompson, 48, Haymarket Terrace (Vine's 'Botany,' Geddes' 'Modern Botany,' and Thomson's 'Animal Life').

The following communications were then read:—

ERGOT OF RYE.

BY J. HARRIS BURNS.

The author gave an interesting description of the structure and life-history of the ergot fungus, his remarks being illustrated by a series of well-executed diagrams.

The next communication was on:—

FERRUM REDACTUM IN PILLS.

BY W. F. HAY.

The author gave his experience of a number of pill masses containing reduced iron and extract of cascara. The pills had been silvered, and after a few hours began to swell, and the silver coating cracked. The addition of glycerin to such masses markedly increased the tendency to crack. The

same difficulty was met with in a pill mass containing extract of logwood and reduced iron, when a small quantity of glycerin was used to make a mass. Also in the case of pills containing arsenious acid and reduced iron massed with glycerin of tragacanth. He found that extract of gentian and reduced iron made a pill which kept well, and he suggested that this excipient should be used in all such cases.

The reading of the papers was followed by a discussion, taken part in by Messrs. Burns, Hay, Hill, Sinclair, and Sutherland, and on the motion of the Chairman, votes of thanks were awarded to the authors.

The Secretary and Treasurer then read the annual report and financial statement, which were approved of. The former showed an increased membership, and the latter a balance of £1 2s. 11d. A sum of £1 1s. was voted to the Benevolent Fund of the Pharmaceutical Society.

The following office bearers were elected for the ensuing year:—President, Alexander Sutherland; Vice-President, J. Macintosh Cameron; Secretary, George Sinclair; Assistant-Secretary, J. Harris Burns; Treasurer, Alexander Murray; and as Members of Committee, Messrs. Cowie, Dey, Guthrie, Hay, McBain, Swanson, Thompson, and Thwaites. Messrs. Cowie, Dey, and McEwan were re-elected members of the Prize Committee.

The arrangements for summer botanical excursions and a suggestion as to holding summer meetings of the Association having been remitted to the Committee, the meeting closed with a hearty vote of thanks to the retiring office bearers.

Correspondence.

[Letters should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.]

THE MAJOR EXAMINATION.

Sir,—If not too late I should like to answer the letter of Mr. Herbert Dyson in your issue of April 18. The chief point in his letter seems to be that the Major examination would be "disintegrated and degraded into a paltry system of piece-meal cram" if the suggestions of "M.F.C.S." were carried out. I ask Mr. Dyson whether he has any knowledge of the schools of pharmacy and the systems of cram in vogue to-day for passing the Major. I contend that there is little besides cram now. I speak from personal knowledge of students, both past and present, in at least three schools of pharmacy. The principals are not to blame. Many of them are men of considerable knowledge. They have not time to impart this knowledge under present conditions, so that their pupils can assimilate and retain it. The knowledge must be crammed in within a given time, no matter what the student's capacity may be. Add to this the fact that genuine students are strongly tempted to adopt this system of cram in order to pass, and I think we may consider the "disintegration and degradation" of

the Major in a fair way to become an accomplished fact, if not already such. I have just received the last edition of Vines' 'Botany,' and will put my case in the form of a question to Mr. Dyson: Which man is the more likely to have a thorough groundwork in botany, the one who has spent six months in systematic and practical study of this book to the exclusion of other subjects, or the man who has devoted a year at one of our schools to the four subjects required for the Major? I agree with Mr. Dyson in deprecating a "modified Major." Along the lines suggested by "M.F.C.S." we are more likely to get an advanced Major or an "honours" division. What I deplore most of all is the killing of the student spirit in the majority of men by the present cram system. Time is required to rouse in men a real and lifelong interest in the subjects they have to study. What do we see everywhere but Major and Minor men losing all interest but that of £ a d. as soon as they have passed! I could say much more, but am afraid this letter is already too long.

ANOTHER ASSOCIATE IN BUSINESS.

A CORRECTION.

Sir,—At the Executive meeting in Edinburgh on April 19 (*Ph. J.* [3], xxv., p. 945) I stated from memory, in reply to Mr. Sutherland, that a notice appeared in a recent *Chemist and Druggist* diary to the effect that the Inland Revenue authorities would not interfere when methylated spirit was supplied by medical orders on Sundays. I find the notice I had in mind appeared in the *British Medical Journal*, April 22, 1893, p. 868. It was in the following terms, in reply to an inquiry by Dr. Taylor, of Richmond:—

"Inland Revenue, Somerset House, London, W.C.
"April 14, 1893.

"Sir,—In reply to your letter dated the 23rd ultimo, I am directed by the Board of Inland Revenue to acquaint you that they have no power to allow the sale of methylated spirits on Sunday.

"I am, however, to add that, in so exceptional a case as that referred to by you, the Board would not be disposed to take any notice of an infraction of the law.—I am, Sir, your obedient servant,

"W. B. HERBERT, Assistant-Secretary."

I shall be obliged by your inserting this correction.

Edinburgh. JAMES L. EWING.

THE COUNCIL ELECTION.

Sir,—I am afraid members of the Society take but little interest in the annual election of the Council, for the reason that so little is known of the opinion of the gentlemen seeking election, or of their ability to make those opinions felt. Still, everyone must admit that it is desirable to place gentlemen on the Council who will not begrudge giving up their time in attending its deliberations, and who have the interests of the retail trade at heart. Among so many good names it is difficult to say which should be left out, but I would recommend to my fellow-electors that of those seeking election, who are not on the present Council, they should vote for the four gentlemen who reside within easy distance of town, or are actually resident there, and to erase from the list the names of existing members who have attended fewest meetings.

Reading.

CHAS. BRADLEY.

. Our correspondent specified certain names in his letter, but for obvious reasons these names are suppressed.—[*Ed. Pharm. Journ.*]

Notes and News.

CONFLICTING EVIDENCE OF ANALYTICAL CHEMISTS.—During the hearing of a summons against Richard Towers for selling adulterated ginger, heard on May 2 at Lancaster, Dr. Eatcourt, county analyst, certified that the sample contained 25 per cent. spent ginger. Drs. Campbell Brown and Williams, Liverpool, certified that the sample, which was supplied by Messrs. Wright, Crossley, and Co., of Liverpool, was absolutely free from adulteration, had no trace of spent ginger, and that anyone who knew ginger could not pretend the sample was other than high-class ginger. The magistrates adjourned the case for a Somerset House analysis.

SOCIETY OF CHEMICAL INDUSTRY.—The Liverpool section of this Society held its last meeting for the present session at University College, on May 2. Dr. C. A. Kohn gave a demonstration on the properties and laboratory preparation of nickel carbonyl, the interesting compound of nickel with carbonic oxide which was described some time ago by Mr. Ludwig Mond. A paper was then read by Dr. Hurter on the "Efficiency of Electrolytic Apparatus," and evoked considerable comment and a warm discussion on the question of electrolysis. The sittings of the section are now adjourned until November, when they will be resumed under the chairmanship of Dr. Gustaf Schack-Sommer.

ORIGIN OF THE WORD "ARSENIC."—A later correspondent of the *Academy*, referring to the former communication on this subject (*ante*, p. 985), says that he was much struck by the writer's opinion that "Dioscorides found in some Eastern language a word meaning *arsenic* (or rather *orpiment*), with some sort of resemblance to *arsenikon*, and transmuted the word into this thoroughly Greek form"; and also that "*σάρδαρη* and *ἀρσενικόν* have both been taken from the same Oriental word." He points out, in turn, that in Chinese the term *hsiang huang* (literally "male yellow")=red sulphuret of arsenic or realgar; while *ts'ü huang* (literally "female yellow")=yellow sulphuret of arsenic or orpiment. These are the only instances with which he is acquainted of minerals differentiated in Chinese by gender.

APPOINTMENT FOR PROFESSOR FREUND.—It is stated that Professor Freund, who is one of the chief authorities on the chemistry of alkaloids, and has for some time past acted as *privat-docent* at Berlin University, has been asked to take charge of the chemical laboratory in connection with the Physical Institute at Frankfort-on-Maine.

GOLD IN THE SEA.—The *Birmingham Gazette* thinks it is some satisfaction to know that when the supply of gold ceases on land, it may be sought for in water. A chemist is alleged to have made the important discovery that in each ton of sea water a quantity of gold exists, and this suggests that there are great mines in the bed of the sea. An analyst who

has "seriously investigated this matter" is also stated to be of opinion that about ten million tons of gold are distributed in the oceans, so that as we only get about two hundred tons every year from the mines on the dry land, "it is time that a company was formed to work the gigantic reefs beneath the sea." This paragraph has duly gone the round of all similar sensational pseudo-news, but the question of the cost of recovery does not seem to have received the attention it merits.

OPENING OF THE SCHORLEMMER LABORATORY.—The Schorlemmer Memorial Laboratory at Owens College, Manchester, the first laboratory exclusively devoted to the study of organic chemistry in England, was formally opened by Dr. Ludwig Mond, on May 3 (see page 1020). The building provides much needed accommodation for the study of organic chemistry, and also includes a large laboratory for medical students, and a room for the preparation and storage of reagents. The total cost of the new building is stated to be £4900.

CHEMISTS' CO-OPERATIVE SOCIETY.—The *Saturday Review*, commenting on the prospectus of this limited liability company, says this is a net skilfully woven on a great scale and cunningly provided with large and small meshes in order, if possible, to catch all sorts of fish. The small investor who timidly looks for good security is cheered with preference shares that are to pay a cumulative dividend of 7 per cent. per annum; the bold man who is not afraid to take a risk, is told of ordinary shares with a dividend of upwards of 16 per cent. per annum, a result which, the directors point out, "is, as regards the businesses purchased, founded on actual past trading experience." The scheme is said to be difficult to characterise. *To-Day* points out the fallacy of the reasoning in the *Financial Times* article (*ante*, p. 986), and observes that the members of the Board are all very worthy gentlemen, but it has yet to learn that any one of them knows much about drugs, unless it be Dr. Clark, "who in distant days may have written prescriptions."

THE SALE OF SECRET REMEDIES.—The *Patent Medicine Journal* thinks that the breaking up of the patent medicines trade would be a blow to thousands, besides the maker. How, it is asked, can ordinary people afford to buy the preparations of doctors and chemists? "If the latter are allowed to become monopolists matters will not be improved in that respect. There are many popular and wholesome remedies now obtainable at low prices, and if they should be swept into the monopolist net and inferior articles substituted for them, the many victims concerned may be trusted to kick—when it will be too late." Perhaps, it is suggested, the new monopolists would better the articles and reduce prices to meet their susceptibilities! The argument of our contemporary is somewhat mixed, but in view of the increasing active opposition of the medical profession to the use of secret remedies, due allowance must be made for wounded feelings. At the same time the suggestions quoted are hardly quite fair.

REVISION OF THE B.P.—The Therapeutic Committee of the British Medical Association has drawn up a list of drugs of doubtful value, and is circulating the same amongst the members of the Association, with a view to ascertaining the relative frequency of the employment of certain drugs and preparations at present official in the British Pharmacopœia.

THE SIZE OF DROPS.—At a meeting of the Royal Society of Edinburgh on Monday last, a communication was read "On Drops," by Mr. J. B. Hannay, who appears to have obtained experimental verification of Tait's conclusion arrived at some years ago. Thus, the size of the drop does not depend upon the weight of the liquid, but is proportional to the diameter of the delivery tube, whilst its separation is regulated by surface tension rather than by cohesion. In the experiments, the disturbing element of viscosity was got rid of by causing a given liquid to drop into another of different specific gravity. The separated particles of water, for example, were allowed to rise upwards in oil. It was further ascertained that when water was dropped in an atmosphere of benzene vapour the drops formed were much smaller than when the surrounding medium was ordinary air.

NUTMEG POISONING.—Cases of poisoning by nutmegs are somewhat rarely recorded in detail. An instance has occurred in America (*Amer. Med. Surg. Bull.*), Dr. Hodgson relating the case of a woman who was poisoned by eating two nutmegs at night and the same quantity next morning. When he saw the patient the following afternoon the pulse was 120, pupils dilated and non-contractile to light, patient drowsy and in pain in umbilical region. Strong tea and tablets of digitalis, strophanthus, belladonna, and nitro-glycerin were given, also 1 grain of caffeine citrate every hour or two. Next morning the pulse was 80, pupils contracted, temperature rose 1°, and urine loaded with phosphates. On the fourth day there was sweating, confined to the lower extremities, which, with the mydriasis, formed the most interesting feature in the case.

APOLOGIA PRO ELECTRICITATE SUA.—Under this heading Dr. W. S. Hedley contributes to the *Lancet* an interesting article on recent progress in electrotherapy, in which he combats the scepticism that prevails on the subject in certain quarters. After dealing with different methods of applying electricity as a remedial agent, the author states that the field of electro-therapeutics seems broadening when looked at from the standpoint of modern practice, and he concludes by saying that when the usual indications fail the medical man, as they often must, he should fall back upon an "enlightened empiricism," and gently feel his way. "He will 'not ask, but try.' He will not be afraid to acknowledge that after all is said therapeutics is to a large extent but a process of cautious experimentation."

Parliamentary News.

REMOVAL OF THE EXTRA DUTY ON SPIRITS.

In the House of Commons on Thursday, May 2, the Budget statement for the year was presented by the Chancellor of the Exchequer, Sir William Harcourt. The only alteration is the remission of the extra 6d. duty on spirit, which has affected chemists somewhat unfairly. The duty had yielded less than half of what was anticipated during the past year.

There is no complexity in the Budget statement this year, which the *Daily News* briefly puts thus:—

1894-5.

Revenue realised	£94,684,000
Expenditure	93,918,000

Realised surplus£766,000

This surplus, of course, goes to the liquidation of debt.

1895-6.

Estimated expenditure (including two millions extra for the navy)	£95,981,000
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Estimated revenue without the extra 6d. on spirits and beer	95,662,000
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Deficit	£319,000
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Renewal of additional 6d. duty on beer from date of its expiration on 1st July, estimated to yield	500,000
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Estimated final surplus or margin	£181,000
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It is believed that a principal reason for the non-realisation of the estimated increase in the spirit duty arising out of the added impost of sixpence, to which the Chancellor of the Exchequer alluded, is that dealers have abstained as far as possible from clearing spirits out of bond in anticipation of the probable relief announced last night. It is expected that after July 1 there will be an immense clearance, by which the revenue will proportionally benefit.

THE HEMP DRUGS COMMISSION.

In the House of Commons on Friday, May 3, Mr. Caine asked the Secretary of State for India if he was aware that the report of the Hemp Drugs Commission appointed by the Government of India in consequence of action taken in this House was, as long ago as August of last year, distributed to the *Times of India*, the *Pioneer*, and the *Englishman*.

Mr. Fowler said that his answer was in the negative.

LONDON UNIVERSITY.

In the House of Commons on Tuesday last, Mr. Acland informed Mr. D. Ambrose that a Bill in pursuance of the recommendations of the Royal Commission, relative to the London University, would be introduced in the House of Lords on Thursday.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

ROYAL INSTITUTION.—The annual meeting of the members of the Royal Institution of Great Britain was held on May 1 at the house of the Institution in Albemarle Street, Sir James Crichton-Browne presiding. The annual report of the Committee of Visitors for the year 1894, testifying to the continued prosperity and efficient management of the Institution, was read and adopted. The Real and Funded Property now amounts to above £102,000, entirely derived from the contributions and donations of the members, and of others appreciating the value of the work of the Institution. Sixty-two new members were elected in 1894, and sixty-three lectures and nineteen evening discourses were delivered in 1894. The books and pamphlets presented in 1894 amounted to about 242 volumes, making, with 578 volumes purchased by the managers, a total of 820 volumes added to the Library during the year. Thanks were voted to the President, Treasurer, and the Honorary Secretary, to the Committees of Managers and Visitors, and to the professors, for their valuable services to the Institution during the past year. The following gentlemen were unanimously elected as Officers for the ensuing year:—President: The Duke of Northumberland, K.G.; Treasurer: Sir James Crichton-Browne; Secretary: Sir Frederick Bramwell, Bart.; Managers: Sir Frederick Abel, Bart., K.C.B., Captain W. de W. Abney, C.B., the Right Hon. Lord Amberst, Mr. William Anderson, Sir Benjamin Baker, K.C.M.G., Messrs. John Birkett, William Crookes, Edward Frankland, Charles Hawksley, John Hopkinson, Alfred Bray Kempe, George Matthey, the Right Hon. the Marquis of Salisbury, K.G., Messrs. Joseph William Swan, Basil Woodd Smith; Visitors: Messrs. John Wolfe Barry, C.B., Charles Edward Beever, M.D., Arthur Carmichael, Carl Haag, Victor Horsley, Hugh Leonard, Sir Joseph Lister, Bart., M.D., Messrs. Lechlan Mackintosh Rate, Alfred Gordon Salamon, Felix Semon, M.D., Henry Virtue Tebbs, Silvanus P. Thompson, John Westlake, Q.C., His Honour Judge Frederick Meadows White, Q.C., and Sir William H. White, K.C.B.

ROYAL INSTITUTION.—A general monthly meeting of the members of the Royal Institution was held on the 6th inst., Sir James Crichton-Browne presiding. The following were elected members:—Mr. Henry Irving, Mr. Henry Perigal, Mrs. Slingsby Tanner, Mr. Ernest H. Fry, Mr. Thomas Muir, Mr. Harold Smith, and Mr. W. S. Smith. The special thanks of the members were returned to Mr. George Matthey for his donation of £50 to the fund for the promotion of experimental research at low temperatures.

CARBOLIC SMOKE BALLS AND MEDICINE STAMPS.—The *Patent Medicines Journal* remarks that the Carbolie Smoke Ball Company, Limited, of Oxford Street, W., seems to be a trifle mixed on the stamp question. The Company has been summoned for selling a box of carbolie smoke ball without a stamp. In 1890 the Inland Revenue people said that it was not necessary to stamp the article in question, but four years later they appear to have discovered that a stamp ought to be used, and, after obtaining a sample unstamped, took out a summons, which resulted in a fine and costs on the defendant company. "Why, however, it was not deemed necessary to use

stamps from 1890 to 1894, and then to suddenly come to a different conclusion, passes the wit of ordinary mortals, but of course the I.R. must maintain their character for eccentricity."

FIRE AT A BIRMINGHAM CHEMIST'S.—On Friday evening last a fire broke out in the basement of the premises over the warehouses and laboratories of Messrs. Southall Bros. and Barclay, pharmaceutical and analytical chemists, Lower Priory, Birmingham. The services of the fire brigade were requisitioned, and after twenty minutes' sharp work with the hand-pump the flames were sufficiently subdued to permit of three firemen being left in charge for the evening. Fortunately the fire was discovered before it had made much progress, or the consequences probably would have been very serious. The actual cause of the outbreak was not discovered, but the fire occurred amongst some litter and empty packing cases.

THREE TOWNS CHEMISTS' ASSOCIATION.—The junior section of the Plymouth, Stonehouse, and Devonport Chemists' Association held their monthly meeting on Thursday, May 2, at the Foresters' Hall, Octagon, Plymouth. Amongst those present were Messrs. E. T. Cocks (in the chair), T. Darke, W. Fairweather, H. Buckner, A. Barber, W. R. Vickery, J. D. Turney, and H. Westcott (hon. secretary). On the motion of Mr. Fairweather, seconded by Mr. Westcott, it was resolved to appoint a chairman at each meeting, in lieu of electing one permanently. After the general business had been gone through, Mr. John D. Turney delivered the second of his most interesting and instructive lectures on *materia medica*. At the close of the meeting a hearty vote of thanks was accorded Mr. Turney, also to the chairman for presiding.

THE BAYLASS DRUG "COMPANY."—On Thursday, May 2, at the Castle of Exeter, before the Registrar (Mr. R. R. M. Daw), the examination in bankruptcy took place of William Dale Baylass, of 50, Union Street, Torquay, chemist and druggist, trading under the style, firm, or company of the "Baylass Drug Company, Limited." This is the case (mentioned in last week's Journal, p. 987) in which a question is raised as to whether certain proceeds of a sale belonged to the Baylass Drug Company, which, it is alleged, was a bogus affair, or to the debtor, Baylass, personally, and an action is pending as to an execution levied by the Sheriff against the Company. Mr. J. I. Carter, Torquay, represented the petitioning creditors; and Mr. Clode, Torquay, the debtor.—Examined by the Official Receiver (Mr. T. Andrew), debtor stated that the gross liabilities amounted to £985, and the deficiency to £729. He started business at Torquay in December, 1893. Prior to that he was conducting, at Stoke-on-Trent, the business of a drug merchant, which he sold to his brother for £800, who paid him £500 and gave three bills for £100 each. He received no money from his brother until he started business at Torquay. He paid Mr. Naish £320 for the business at Torquay, the latter not being satisfied with the valuation of £309. The whole of the money he received from his brother he put into the business after paying Mr. Naish. His takings, per cash-book, for the period from December, 1893, to June, 1894, were £533. There had been no recent entries in the cash-book, and the leaves that were missing were removed owing to a misunderstanding at the outset as to the method of keeping the accounts. Two of the bills given by his brother had been met, and the money put into the business

Before the third bill became due debtor wanted money, and obtained from his brother a cash advance of £100, giving a bill, and allowing the bill given by his brother to be renewed or continued. The average turnover of the business was £20 a week, or about £1040 a year. He considered that 10 per cent. upon the turnover would be a fair allowance for profit. The profit would not be higher than 15 per cent., or £150 a year, yet his yearly business outgoings and family expenses amounted to over £600 a year. He had contemplated larger returns being made. The Official Receiver observed that debtor would require them to be quadrupled. It seemed to him to be a reckless way of going on. Debtor further stated that he put the value of his stock at £1500, but the sales of the Sheriff and the Official Receiver realised £250 and £200. Examined by Mr. Carter, debtor said the monies received from his brother might not all appear in the bank pass-book, but it went, nevertheless, into the business. The Registrar remarked that it appeared that debtor's brother had consented to treat the debtor in an individual capacity. If the concern should turn out to be a company, where would the brother be? The examination was adjourned to July 18, pending the result of the proceedings in the High Court of Justice as to the execution levied by the Sheriff against the company.

OPENING OF THE SCHORLEMMER LABORATORY.—On May 3, at the Owens College, Manchester, Dr. Ludwig Mond formally opened the Schorlemmer Laboratory which, the *Manchester Guardian* remarks, is the result of the general feeling that the best memorial of the late Professor Schorlemmer would be the erection of a laboratory for organic chemistry, to be called after his name. A subscription list was accordingly opened, and the appeal, which was generously headed by Dr. Mond, was so well responded to, both in this country and in Germany, that in a short time a sum of £2500 was subscribed. In view of the steady increase in the number of students, the Council had meanwhile become convinced of the necessity of extending the chemical department. They accordingly accepted the fund raised by the Schorlemmer Memorial Committee, and instructed Mr. Alfred Waterhouse to prepare plans for a Schorlemmer Organic Laboratory, and for a new laboratory for elementary students, on a plot of land adjoining the present laboratories acquired by the College for the purposes of their extension. The Schorlemmer Laboratory is at the end of the main corridor in the old chemical building, measures 60ft. by 30 ft., and has an arched roof 30 ft. high. It is designed to accommodate a professor, two demonstrators, and thirty-six students, and is fitted in the most complete manner, with every requisite for the important work to be carried on within it, in some particulars being arranged after the plan of the Munich laboratories. The lower laboratory is designed for forty-five students. The fittings are similar to those in the old laboratories designed by Sir Henry Roscoe. The reagent-room, 20 ft. by 20 ft., communicates by a flight of steps with Burlington Street. The total cost of the new building is £4800.

Sir H. E. Roscoe, M.P., gave a brief sketch of Schorlemmer's life, and described how he came to him as assistant, and remained his faithful and intimate friend for thirty-four years. When Dittmar resigned Schorlemmer was placed in the position of sole assistant and demonstrator to a somewhat increased number of students. In that new position his powers as a laboratory teacher soon made them-

selves manifest, and much of the subsequent success of their laboratory was due to his tact and knowledge, and to the genuine enthusiasm which he displayed in imparting that knowledge to others. He (Sir H. Roscoe) remembered as though it were only yesterday the first beginning of the original work which had made his name eminent amongst the chemists of the time. Mr. John Barrow, of Gorton, who was then occupied with the manufacture of benzene by the distillation of cannel coal—for the supply from the gasworks was then not equal to the demand—sent him (Sir H. Roscoe) some of the light oils which he obtained in his process. They were of no commercial value, and had not been investigated. He submitted these oils to Schorlemmer, knowing their investigation was a hard nut to crack, but knowing also that Schorlemmer was the man to crack it. The examination of these oils was the beginning of Schorlemmer's scientific fortune. Schorlemmer's scientific work was written in every manual of organic chemistry throughout the world, and had been described fully in his own 'History of the Rise and Development of Organic Chemistry,' recently edited by his pupil, Professor Smithells, whilst his investigations on the constitution of the hydrocarbons marked an era in modern organic chemistry. Whilst his work in itself had a purely scientific value, it, like much other work of a similar character, enabled other men to build up an industrial structure the value of which was measured by millions of pounds sterling, and gave now employment to thousands of men. For it was not too much to say that without Schorlemmer's discoveries the knowledge of the constitution of the carbon compounds which we now possess, as typified by Kekule's theory, could not have been arrived at. Schorlemmer's power of work was simply prodigious, and his knowledge of chemical literature deep as well as broad. He much valued and made use of their admirable medical library. He, of course, lived and died a poor man, though had he chosen he might have amassed a large fortune. His distinction was, however, none the less on that account, but, as some would think, all the more.

Dr. Ludwig Mond said the opening of the first laboratory solely devoted to the study of organic chemistry, at the only University in England which could boast of a professor of that subject, marked a distinct step forward in the development of science in this country. In dedicating that laboratory to the memory of Schorlemmer, to whom science and that University owed so much, they must all regret that it was not vouchsafed to him to have the use of such a special laboratory at his disposal. Nevertheless, the spirit which he infused into his work, his pupils, and his books would be the most valuable endowment which the new building inherited, and would manifest itself in the work of all those who had the good fortune to work there, if they approached their task with the same single-mindedness and love of truth that marked the late Professor Schorlemmer. His work had been singularly fruitful in clearing up and putting on a sound basis the modern theory of organic chemistry called by him so appropriately "the chemistry of the carbon compounds." For it was Schorlemmer who provided the fundamental proof of the equal value of the four valencies of carbon, the very corner-stone of the great edifice by which we had obtained an insight into the simple laws upon which the immense variety of organic compounds was built up. And the value of the work not only extended to the chemistry of carbon, for the more they succeeded in penetrating into the constitution of the more complex compounds of other elements, the more they were forced to apply the same laws which

they owed to the study of organic chemistry, to explain their constitution.

THE LIQUEFACTION OF GASES.—Professor Dewar continued his historical retrospect of the subject of liquefying the so-called "permanent" gases at the Royal Institution last week, and from a scientific point of view, remarks the *Daily Chronicle*, the discourse was highly interesting, and many of the illustrative experiments of great importance. The lecturer pointed out the work done by Faraday in the way of liquefying gases by means of the cooling properties of solid carbonic acid, further heightened by the process of boiling off the carbonic snow in a vacuum, thereby considerably lowering its boiling point. By this means the very low temperature of 110° below zero (Centigrade) was reached, and with adequate pressure nearly all the compound gases gave up the contest at this point and passed into the liquid state. But still oxygen, nitrogen, marsh gas, and hydrogen resisted. In 1845 Faraday thought to make a further step forward by using liquid nitrous oxide (laughing gas) as a cooling agent, but to very little purpose. However, they got down to 120° below zero. Then followed elaborate experiments by the celebrated Regnault to determine the exact relationship of what are known as the "three constants"—namely, pressure, temperature, and volume.

In 1862 Professor Andrews made a series of still more important experiments, which remodelled the results of Regnault, and later on Van der Vals, Thompson, and Armiga conducted researches which may be said to have fairly settled the modern theory of gaseous volume, temperature, and pressure. In the meantime two ingenious commercial men of chemical leanings, one M. Pictet, of Geneva, and the other M. Cailletet, of Paris, applied the new theories on a large scale to the liquefaction of oxygen gas. They were working both unknown to the other. Cailletet used two currents of liquid carbonic acid and liquid sulphurous acid, continuously circulating under exhaustion, and applied the intense cold produced to oxygen under a pressure of 300 atmospheres—a daring sort of proceeding—with the result that he obtained large quantities of liquid oxygen spray. He was the first who ever produced liquid oxygen, and both he and Pictet came to the conclusion that all the so-called "permanent gases" could be liquefied under pressure if a sufficiently low temperature were only applied. Pictet opened very important ground in turning his attention to the hydrocarbon gas, ethylene, as a means of producing cold. It can be liquefied, and boils at 100 degrees below zero. When evaporated in a vacuum, very low temperatures can be obtained.

Professor Dewar showed how liquid ethylene freezes water when poured on the surface, and made several other experiments to illustrate its highly volatile nature. In his final lecture the Professor intends to show how ethylene was ultimately used to solve the problem of liquefying the atmosphere. He remarked, however, in concluding his lecture that a heated controversy had arisen out of the application of ethylene for this purpose. Pictet started by using it as Faraday did solid carbonic acid—at the ordinary atmospheric boiling-point—but before he had gone on far two other experimenters got ahead of him by using it at a vacuum boiling-point. They naturally succeeded in getting to the desired goal, but it was said that if they had not rushed in and anticipated this way of using ethylene, Pictet would in due time have arrived at the same point, and that therefore the originality of that discovery was his by right.

EDINBURGH PHARMACY ATHLETIC CLUB.—The annual general meeting of the Club was held in the Pharmaceutical Society's Hall, 38, York Place, Edinburgh, on Wednesday, May 1, at 9.15 p.m., Mr. W. D. Jameson, President, in the chair.

The minutes of last meeting were read and approved.

The President said he had to congratulate the Club on having reached the end of another year in their history. They were now in a very flourishing condition, both in regard to membership and funds. The Club, he thought, had done a great deal for its members by encouraging a taste for athletics among those connected with pharmacy.

The Secretary then read the annual report, showing a total membership of 85. The most successful section during the year had been the golfing section, conducted by Mr. Welsh.

The Treasurer then read the financial statement, showing a balance of £9 2s. 9d. The income at the annual sports amounted to £58 10s. 11d., and they had expended, on prizes and rental, £45 10s. 3d.

The report and statement were unanimously adopted.

On the motion of Mr. Gibb, seconded by Mr. Birnie, it was agreed to reduce the annual subscription to 3s. 6d. for members, and 2s. for apprentice members.

It was resolved to add the following new rule:—

"Members of this Club entering under the name of the Edinburgh Pharmacy Athletic Club, and establishing Scottish records in open flat-race competitions, or gaining a Scottish flat-race championship, shall be awarded a gold medal."

The arrangements as to apprentice races at the proposed annual sports on May 28 were remitted to the Committee to decide, and the football regulations were adhered to.

The following office bearers were then elected for the ensuing year:—Honorary President, Mr. D. MacLaren; President, Mr. John Brown; Vice President, Mr. W. B. Cowie; Secretary, Mr. J. P. Gibb; Assistant-Secretary, Mr. G. F. Anderson; Treasurer, Mr. A. S. Birnie; and as members of Committee, Messrs. Jameson, Kinninmont, Leitch, McBain, Paterson, Somerville, and Sutherland.

On the motion of Mr. Mathewson a hearty vote of thanks was awarded to Mr. Gibb and other office bearers, and a similar vote was cordially awarded to the retiring President, Mr. Jameson, on the motion of Mr. Birnie.

The meeting then closed.

Notes in Brief.

EMULSIONS are frequently made in America by plunging into the mixture of ingredients a vaginal syringe, and working it vigorously until the emulsion is perfected.

LIQUID GLUE of great adhesiveness, that dries quickly and keeps well, can be made, according to the *Pharmaceutische Centralhalle*, by dissolving glue or gelatin in aqueous chloral hydrate solution.

ARGON is readily shown to be present in the atmosphere, and isolated, according to M. Guntz (*Comp. rend.*), on absorbing the nitrogen by means of lithium heated to a temperature below a dull red heat.

CHOLESTERIN FATS of the skin are separated by Liebreich into those with a high melting point, resembling wax and containing cerotic acid, and those with a low melting point.

Poisoning Cases and Inquests.

Sulphuric Acid.—Ellen Wilkes, the daughter of a tradesman living at Stonebridge Park, Willesden, died there on Tuesday, April 30, from the effects of drinking sulphuric acid. Verdict: "Accidental death".

Carbolic Acid.—Thomas Bailey, aged 65, died on Thursday, April 25, at Oldfield Farm, Dunham Massey, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Carbolic Acid.—At the inquest held at the Rolle Hotel, Exmouth, on Monday, April 29, on the body of Frank Michael Sanders, aged 31 (see *ante*, p. 988), a verdict of "Suicide whilst temporarily insane" was returned.

Prussic Acid.—Henry William Hall, aged 34, died on Monday, April 29, at 89, Holland Road, Brixton, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Prussic Acid.—James Dixon, described as a chemist, but not registered as a chemist and druggist, died on Friday, May 3, at Manby Street, Stratford, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst insane."

Morphine.—Evelyn Ward, aged 32, died on Sunday, May 5, at 37, St. Paul's Street, Huddersfield, from the effects of morphine, taken to induce sleep. Verdict: "Death from poisoning by morphine."

Rat Poison.—James Hale, aged 25, died on Tuesday, April 30, while on the way to the Guest Hospital, Dudley, from the effects of a rat poison, self-administered.

Potassium Cyanide.—At an inquest held on May 6, at Margate, on the body of Edward George Knott, it transpired in evidence that deceased, on May 3, asked a photographer to let him have some cyanide of potassium to kill a dog for a lady, who was to pay him 5s. for the job. The photographer wisely refused, and advised him to let a veterinary poison the dog for 2s. 6d., and he be satisfied with the remainder for his trouble. About two hours later he was found dead in his bed with an empty 1 oz. prussic acid bottle beside him; but no evidence was produced to prove who supplied it. The label was found on the floor of a bar in the locality almost obliterated; the pieces were carefully placed on paper, when the following letters appeared, A. C. D. R. Y. P. Verdict: "Deceased died from prussic acid, self-administered while temporarily insane."

Trade Marks Applied For.

[From the *Trade Marks Journal*.]

No. 185,968.—AN OINTMENT FOR HUMAN USE.—Catherine Jane Lee, 28, Upper Phillimore Place, London, W. March 4, 1895. Device—An animal on a bough.

No. 185,440.—A MEDICINAL POWDER enclosed in cachets of wafer paper, for the cure of headache, neuralgia, and rheumatism; also a liniment for the cure of neuralgia and rheumatism.—David Donaldson Buchan, 8, Gardyne Street, Frioockheim, Forfarshire. February 8, 1895. For cachet, words: "Evenia" and cachets for headache, neuralgia, and rheumatism. For liniment, words: "Evenia," and liniment for neuralgia and rheumatism. The essential particular of each is the word "Evenia."

No. 185,382.—PERFUMERY (including toilet articles and preparations for the teeth and hair).—Blondeau et Cie, Ryland Road, London, N.W. February 6, 1895. Device—A cupid in chariot drawn by a butterfly.

No. 186,346.—CHEMICAL SUBSTANCES prepared for use in medicine and pharmacy.—Henry Daubeney Brandreth, 22, Hamilton Square, Birkenhead. March 20, 1895. Word, "Exaino."

Obituary.

GORDON.—On April 30, William Gordon, Chemist and Druggist, Aberdeen. (Aged 72.) Mr. Gordon had been a member of the Pharmaceutical Society since 1878.

PLAISTER.—On May 2, W. J. Plaister, Chemist and Druggist, London. (Aged 59.) Mr. Plaister had been an Associate of the Pharmaceutical Society since 1869.

HAWTHORNE.—On May 2, Thomas Oliver Hawthorne, Chemist and Druggist, Stafford. (Aged 68.) Mr. Hawthorne had been in business in Gaolgate Street, Stafford, for forty-seven years.

BUCHANAN.—On May 5, Sir George Buchanan. (Aged 64.) The *Daily News* points out that Sir George Buchanan, who was so long associated with the Local Government Board as its chief medical officer, had only a few days ago completed the report of the Royal Commission on Tuberculosis, of which he was Chairman. Having worked assiduously upon this Commission, in spite of failing health, and brought its labours to a successful conclusion, Sir George submitted himself to an operation for an internal complaint. The results were declared to be perfectly satisfactory, and Sir George was practically out of the charge of doctor and nurse. On Sunday he chatted cheerfully with his relatives, but on the same evening, to their inexpressible grief, he was overcome with sudden failure of the heart's action, resulting in his death within a few minutes. Sir George Buchanan, M.D., LL.D., F.R.S., was the elder son of the late George Adam Buchanan, and was born in 1831. He received his education at University College, London, where he greatly distinguished himself, taking scholarships in medicine and surgery. He took his B.A. degree in 1851, and obtained his M.D. in 1858. He had a successful practice for years as a London doctor. The appointments of physician in the London Fever Hospital, and also in the Hospital for Sick Children, were for some time held by him, and he early gained experience in the kind of work to which the greater part of his life was afterwards devoted as medical officer of health for St. Giles's. In this capacity he was one of the first medical officers of health appointed in London. His attention being thus expressly directed to sanitary science and the study of disease prevention, he made such good use of his opportunities that in 1861 he was marked by the Privy Council for special duties as a medical inspector. His reports on vaccination, on the health of the Lancashire mill operatives during the cotton famine, and on the relation between moisture of the soil and the prevalence of consumption are a part of the public health literature of the country. Many administrative duties were imposed upon him in connection with outbreaks of disease in the country. His services in connection with the cholera outbreak of 1866 are especially remembered. On the constitution of the Local Government Board in 1871 he became assistant medical officer, and ultimately in 1879 succeeded Dr. Seton as principal medical officer to the Board. This office he held continuously until 1892. In recognition of his distinguished services in that capacity the Royal Society upon his retirement founded a gold medal, which in the first instance was awarded to Lady Buchanan, a graceful compliment honouring not only Sir George, but the memory of his predecessor, Dr. Seton, who was Lady Buchanan's father. The medal in future years is to be for brilliant services in the cause of public health. In the splendid history of the sanitary progress of Great Britain since the formation of the Local Government Board Sir George's own place is unique. He has

done much to make that history, and in the records of the Board he has written it. He was the constant adviser, officially and voluntarily, of medical officers of health throughout the country, and was the last President of their association. Sir George was a past President of the Epidemiological Society, a Fellow of the Royal Society, a Fellow of the Royal College of Physicians, and Censor to that college from 1891 to 1894. For many years he was a member of the Council of University College. In that capacity, and in that of a member of the Senate of London University, he was instrumental in affording facilities for the education of women.

On May 6 Karl Vogt died at Geneva. (Aged 78.) The celebrated German biologist, according to the *Times*, was born at Geissen, and first came into pre-eminence as the active collaborator of Agassiz and Desor, and was joint author of the famous work on fresh-water fishes. After a residence of two years in Paris and a visit to Italy, he returned to Germany to occupy a chair at the University of his native town, but his professorial career was cut short by the revolution of 1848. He threw himself with ardour into the democratic movement, was chosen as Colonel of the Geissen Civic Guard, and elected deputy to the German National Assembly, where he distinguished himself as a brilliant orator and an untiring advocate of democratic progress. He followed the Parliament on its transfer to Stuttgart, and was one of the last supporters of National party. His services to the cause which he had espoused, however, cost him his Professorial Chair, and obliged him to leave Germany. He then retired to Berne, and afterwards to Nice, where he resumed his biological researches. In the following year he was appointed professor at Geneva, and from that time identified himself with the civic life of the country of his adoption, becoming a member of both the Federal and National Councils. Of his voluminous works, perhaps the most celebrated was his book entitled 'Science and Superstition,' which was a fierce polemic against the intervention of religion in science, and at once made its author one of the leaders of scientific materialism in Germany. Another book which created considerable stir was Vogt's 'Investigations into Animal Communities,' which consisted of a scathing criticism of the vices and weaknesses of human societies.

ARNOLD.—On May 16, Alfred Arnold, chemist and druggist, of Pentyls Aberavon, Port Talbot (late of Carn-Avon, Glamorganshire, previously of Kingsland, London, N.E.), in his eightieth year. Registered as having been in business prior to August, 1868.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[From the *Illustrated Official Journal (Patents)*.]

No. 7944.—Improvements in or relating to bottle-washing machinery. April 22, 1895.

No. 7963.—Improvements in bottle-filling machines for filling aerated liquors, either fermented or otherwise, and for closing bottles by screw stoppers or corks worked by hand or power. April 22, 1895.

No. 7970.—A label clip. April 22, 1895.

No. 7988.—An improved product for use in the preparation of articles of food. April 22, 1895.

No. 8021.—Improvements in self-sealing bottles. April 23, 1895.

No. 8038.—Apparatus for racking liquids. April 23, 1895.

No. 8064.—Improvements in or substitutes for children's teething pads or soothers. April 23, 1895.

PATENTS PUBLISHED APRIL 27.

Nickel and Cobalt (Manhes, P.).—The invention is comprised under two patents numbered 6914 and 6984 of 1894, and refers to the preparation of commercially pure nickel or cobalt from the ore. According to the first patent, the sulphide of nickel or cobalt obtained as a matte in the ordinary smelting operations, is broken and mixed with a mixture of the oxide and chloride of calcium, barium, magnesium, potassium or sodium, or of the oxide of one and the chloride of another of those metals. The inventor prefers to use "a mixture of lime and chloride of calcium, or, better still, chloride of lime." On heating the mixture in a furnace, the matte loses its sulphur, part of which escapes as sulphur dioxide, while part remains in the slag as sulphide. Patent No. 6984 provides for the elimination of iron. The ore is melted in an ordinary furnace, from which it runs into a converter furnace, where it is mixed with boracite (native calcium borate). It is there treated with an air blast, which drives off much of the sulphur and oxidises the iron so that it combines with the boracite and passes into the slag. Finally, the slag is run off and the residual metal is treated as in patent No. 6914, to remove the remainder of the sulphur. The boracite may be replaced by the borate or other suitable salt of sodium, potassium, or aluminium.

Labelling poison bottles, etc. (Maud, W. R.).—A suitably shaped metallic or other disc, properly inscribed, to indicate the contents, and somewhat larger than the cork, is secured thereto so that no one can open the bottle without being warned of the contents by touching the disc. No. 9073 of 1894.

Sodium and potassium (Vautin, C. T. J.).—The chloride or other salt of sodium or potassium is fixed in a crucible or other vessel upon a surface of molten lead or tin, which forms the cathode of an electric circuit. The anode may be of carbon. The potassium or sodium alloys with the tin or lead as fast as it is reduced, and the resultant alloy is transferred through a pipe in the bottom of the vessel into a retort in which it is distilled, preferably by the heat from carbon rods heated by electricity. The potassium or sodium is condensed in a worm, and the lead or tin is used again. No. 10,197 of 1894.

Sulphur candles or fumigators (Kingzett, O. T.). A stick of sulphur is wrapped in a casing of tin or other metal foil whose upper end is bent over to secure a piece of fabric soaked in sulphur, and serving as a lighter for starting combustion. The foil may be perforated or "serrated." The "candle" may be nearly submerged in water which evaporates as combustion proceeds, but prevents danger of fire. No. 10,445 of 1894.

Deodorising petroleum, etc. (Tempère, A. J.). Petroleum or other hydrocarbon is mixed with amyl-alcohol in the proportion of about 10 grammes per litre of oil. The odour of the amyl-alcohol overcomes that of the petroleum, etc., but is said not to interfere with its use. No. 10,772 of 1894.

Inhaler (Quaglio, J.).—The invention comprises a cup-shaped mask having an absorbent interior surface and connected through a tap with a receptacle containing the chloroform, eau de Cologne, etc., to be inhaled. On opening the tap and squeezing a collapsible rubber ball, the liquid is driven into the mask and, having saturated the absorbent surface, the excess is allowed to return by permitting the ball to re-expand. The collapsible ball may itself constitute the reservoir. No. 10,950 of 1894.

Massage, etc. (Lake, H. H., communicated from Schaefer, E.).—For the purpose of massage or for rubbing in ointments, etc., the inventor employs a metal or other ball rolling freely in every direction in a casing which serves as a handle and extends far enough over the ball to prevent it from falling out. The ball is removable, and means for supplying an electric current to it are fitted to the casing. No. 11,000 of 1894.

Filter (Chamberland, C. E.).—Refers to patent No. 5339 of 1884, and consists in filtering and sterilising water by passage through porous pipes, etc., as in the Pasteur filter. The filtration is now effected by passing the liquid successively through two or more such filtering media, the area of the first and following surfaces being so adjusted that a practically constant outflow shall be obtained. Each section of the filter may be a single tube or a series of them. No. 11,090 of 1894.

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

CALCIUM GLYCEROPHOSPHATE PREPARATIONS.

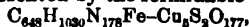
[851.] Professor Gay, of Montpellier, prepares an aërated solution of calcium glycerophosphate, as follows (*Bull. de Pharm.*, March):—Calcium glycerophosphate, 10 to 30 Gm., and citric acid, 5 to 7 Gm., are dissolved in sufficient distilled water to make 1 litre. Sodium bicarbonate, 4 Gm., is then introduced into the bottle, which is immediately closed. He also prepares a syrup by dissolving calcium glycerophosphate, 10 Gm., and citric acid, 1 Gm., in distilled water, 340 Gm., and then dissolves in the solution without heat sugar, 610 Gm. Simple or aromatic syrup is then added to make up to 1 kilo.

CREOSOTE PILLS.

[852.] On the grounds that albumin chemically fixes creosote, Schreiber has devised the following method for preparing pills of that substance, which, he claims, are accurate in dosage, and which keep well. Creosote, 6 grammes; dried egg albumin, 3 grammes; distilled water, 10 drops. Mix and add powdered licorice root and extract of licorice sufficient to mass. Divide into sixty pills. These pills are insoluble in water, but are dissolved in the process of digestion.

COPPER HÆMOL.

[853.] This compound of copper and hæmoglobin, which is represented by the formidable formula—



has been introduced by Merck. It is proposed that it should be administered as a powder thus:—Copper hæmol, 0.1 gramme; chocolate powder, 0.5 gramme. One powder to be taken three times daily. In cases of debilitated digestion the powders should be taken with the meals. The dose should not exceed 0.5 gramme (*Apoth. Zeit.*, April 17, 1895).

MASS FOR MEDICATED BOUGIES.

[854.] Cacao butter, 4 parts; powdered gum acacia, 2 parts. Mix intimately and add, with constant kneading, a mixture of glycerin, 1 part; water, 2 parts. If required, the quantity of cacao butter may be slightly increased (*Pritzker; Rev. Therapeut.*, Feb., 1895).

TRAUMATICIN.

[855.] Traumaticin is a saturated solution of gutta-percha in chloroform; it is most advantageously prepared as follows:—The lightest coloured gutta-percha procurable is cut into small pieces and macerated with 12 or 15 times its weight of pure chloroform for twenty-four hours, with frequent agitation. The mixture is then transferred to a retort, and about one-third of the chloroform distilled off over a water bath. The traumaticin thus obtained is a thick homogeneous liquid, to which the requisite medicament may be added. For ichthyol traumaticin 3 parts of ichthyol are added to every 10 parts—similar proportions are used for salol, lysol, and phenol. Corrosive sublimate is added in the proportion of 1 part of sublimate for 100 parts of simple traumaticin. If the simple traumaticin should be coloured, and a colourless medicament is to be added, it may be decolourised by means of animal charcoal. It is best applied with a brush of hog's bristles, and forms a thin impermeable, pliable pellicle when the chloroform dries off. It gives rise to no discomfort, except a sense of burning when first applied, due to the chloroform. Traumaticin of ichthyol is of special service in the case of erysipelas (*Bull. Gen. de Thérap.*, Feb., 1895).

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

. Queries will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTER.

MAJOR EXAMINATION.—Mr. S. C. Frederick Miche of The Pharmacy, St. Austell, writes as follows:—"W: you allow me, through your Journal, to thank the gentlemen who have sent me their names and address to be added to the memorial to be placed before the Pharmaceutical Council. I would suggest that the example of some be followed, who have not only sent their own names but canvassed others (in one instance twenty names), for if so, we should soon have an imposing and influential list. The list will be open until the end of May."

ANSWERS.

J. ROTHWELL JONES.—Your letter has been sent to 5 Serle Street, where it should have been directed.

W. A. MANNING.—Letter with enclosure received.

E. F. HARRISON.—Received with thanks. Very satisfactory.

J. J. BROWN.—See footnote on page 952.

C. J. S. THOMPSON.—Please send on the illustrations as early as convenient.

STUDENT.—No such compound has yet been obtained.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Bayley, Bradley, Braithwaite, Brown, Cripps, Fitzgerald, Groves, Harrison, Harvey, Henry, Heppel, Hill, Holloway, Howe, Kirkby, Macartney, Marshall, Michell, Millard, Moffatt, Phillips, Reynolds, Shapley, Talis, Thompson, Wooldridge.

Publications Received.

[Publishers are requested to state the price of books sent for review.]

OFFICIAL GUIDE TO THE MUSEUMS OF ECONOMIC BOTANY AT THE ROYAL GARDENS, Kew. No. 2—Monocotyledons and Cryptogams. Pp. 109. 4d. From the Director.

ORGANIC CHEMISTRY, THEORETICAL AND PRACTICAL. By ISAAC SYDNEY SCARF, F.I.C. Pp. 240, with 36 illustrations. Price 2s. (William Collins, Sons, and Co., Ltd., Bridewell Place, London, 1895) From the Publishers.

THE ELEMENTS OF HEALTH, by LOUIS C. PARKS, M.D., D.P.H. Lond. Pp. 246, with 27 illustrations. Price 3s. 6d. (J. and A. Churchill, London.) From the Publishers.

RICHARD OWEN.

"THE GREATEST ANATOMIST OF HIS AGE."

So strong has become the scientific spirit, so strong the classificatory instinct, that unconsciously we take it for granted that some label denoting a characteristic must be placed over the niche in which will be deposited the deeds of the nineteenth century. It has been suggested that it will be known as the age of railways, or the age of electricity, or the age of steam, or the age of some mental or political attitude of the people, as the critical age or the democratic age. But it is vain to attempt an estimate of the value either of the literature, thought, or deeds of the age. They are so near as not to permit even an approximately true perspective being obtained of them. Of this, however, we may be sure that this century has witnessed the acquisition of such a store of scientific facts as no previous age has ever known—facts which are gradually forming a broad foundation for an adequate scientific philosophy. What was done for chemistry in the latter half of the eighteenth century by Scheele, Priestley, Cavendish, and Lavoisier, in the accumulation of the records of precise observations, has been done for comparative anatomy by numerous workers in this century, and the foremost amongst these was Richard Owen, whose biography has recently been published by Mr. Murray.*

The story of Owen's cheerful life is told chiefly through the medium of his letters and of extracts from his wife's diary. The air of thankful satisfaction which pervades his correspondence, and is reflected by Mrs. Owen's daily records of their outgoings and incomings, exerts a benign influence in these days of cheap pessimism.

Richard Owen was born on July 20, 1804, at Lancaster, in a house which is still standing in Thurnham Street. At the age of six years he was sent to the old Lancaster Grammar School, where he was a contemporary with Whewell, a carpenter's son, who became the famous Master of Trinity. In 1820 he was apprenticed to a Lancaster surgeon and apothecary. His master dying in 1822, he was transferred to a Mr. Seed, and in 1823 he had to find a third master, in consequence of Mr. Seed accepting a post in the Royal Navy. It was during his apprenticeship that the two episodes transpired of which in later years he gave an account in 'Hood's Magazine.' Although these are pretty familiar, the story of the negro's head is sufficiently unique to tempt quotation here. To use Professor Owen's own words: "My worthy preceptor was called out one evening to the case of a sailor who was brought home in an apoplectic fit after receiving a heavy fall in a drunken fray at a public house. The doctor found it a hopeless case, and the man passed from his stupor into death. After his death his widow and daughter retired to one of the little houses which face the steepest part of the hill leading to the castle gates. One evening they were talking about the slave trade, in which occupation it appeared the unfortunate husband and father had spent a large part of his active life. The two women had

finished their meal and were sitting before the fire, by the light of which they were holding their conversation. The mother was feebly attempting to make a case in defence of the traffic, when on a sudden the attention of both was roused by a sound of footsteps rapidly approaching the door, which was immediately burst open by a heavy blow. A piercing shriek came from the mother, who rushed into the adjoining bedroom; the daughter started and turned towards the cause of the noise and her mother's fright, and saw what she afterwards described as the phantom of a negro slave lying on the floor, which turned its ghastly head and glared for a moment upon her with white protruding eyeballs. A figure in black entered as she fled screaming after her mother. When the two terrified women ventured at length to glance into the room from which they had been scared, all was quiet; the red glow from the fire showed everything to be as they left it. What could this be except an apparition of the captain with his negro slave, and the old gentleman himself in black pursuing them." The true cause of the apparition was rather more substantial, but scarcely less shocking. Owen had begun to make a craniological collection, and having had one day to assist at the necropsy of a negro who had died in the castle, which is also the county gaol, he was seized with the desire to add the skull of the Ethiopian to his collection. Accordingly the same evening, a frosty one in January, he re-visited the castle, and, being on good terms with the turnkey, proceeded to the room in Hadrian's tower to possess himself of the coveted specimen. He had provided himself with a strong paper bag, and into this he placed the skull, covering the whole with his cloak. As soon as he was outside he began to hasten down the hill, but his foot slipped upon the ice-covered pavement, he fell forward and the skull jerked out of the bag, rolled down the declivity, and struck the cottage door of the widow and her daughter, finding a resting-place for an instant upon the floor of the room. Owen dashed desperately after his prize, and, gathering it into his cloak, ran off and never stopped until he reached the surgery.

Owen matriculated at Edinburgh in 1824, and in the following year came to London and became prosecutor to Dr. Abernethy, who in 1826 started him upon his distinguished and honourable career by procuring him the appointment of assistant to the Conservator (Mr. Clift) of the Museum of the Royal College of Surgeons. The appointment was made with a view to Owen undertaking the arrangement of the collections formed by John Hunter, which had recently been placed in the care of the college. In subsequent years Owen and Mr. Clift's daughter were married. The union must have been an almost ideal one. Throughout these volumes respectful love and care for his wife are exhibited in all Owen's letters and actions. And on her part a loving devotion to, and veneration for, her husband are modestly manifested.

From this point Owen's life was one long continuous accession of honours and pleasure. The proverbial ups-and-downs never came within his experience. He appears to have been spared all sorrows excepting those which make the fundamental basis of all the music of mortal life. But so far from spoiling his spirit, from unduly elevat-

* 'The Life of Richard Owen,' by his grandson, the Rev. Richard Owen, M.A., in two vols. John Murray, London, 1894.

ing him, the honours which were literally showered upon him only seem to have increased the thankfulness of a disposition which was not envious in the slightest degree. His enjoyment of life was intense, and this was a consequence of his intense love for his work. It is apparent that he experienced the satisfaction born of well-earned reward, but there is no evidence that this feeling ever gave birth to arrogance; rather he was humbly grateful that his powers were competent to earn his rewards.

He writes in the year 1830:—"I made Cuvier's personal acquaintance at the Museum of the College of Surgeons, and was specially deputed to show and explain to him such specimens as he wished to examine. There was no special merit in my being thus deputed, the fact being that I was the only person available who could speak French, and who had at the same time some knowledge of the specimens. Cuvier kindly invited me to visit the Jardin des Plantes in the following year." To a man of Owen's tastes a meeting with the great anatomist must have been big with desires for ambitious work in the future. The acceptance of Cuvier's invitation in the succeeding year doubtless confirmed the desires as resolutions.

Owen's friendship with the Rev. Dr. Buckland seems to have begun when Owen was twenty-eight years of age, by his sending Dr. Buckland one of the proofs of his work on the Pearly Nautilus, together with a letter in which he says: "Since the decease of the lamented Cuvier, there is no one whose opinion on this work I look for with more anxiety than your own." The friendship between these two leaders of scientific thought and research became very close and cordial. The year 1834 witnessed Owen's appointment to the professoriate of comparative anatomy at St. Bartholomew's, and his election as a Fellow of the Royal Society. In 1836 he was appointed Hunterian Professor at the Royal College of Surgeons. This latter appointment was a source of peculiar gratification to him, and the twenty-four annual lectures which he delivered from this chair were the result of his best thought and work. Up to 1837 Owen had to some extent cultivated a medical practice, but experiencing a pressure of scientific work, he decided to relinquish it altogether and devote himself entirely to research. He was an indefatigable dissector and his opportunities were many. The animals which died at the Zoological Gardens were at his disposal, and so rapidly had his fame as an anatomist spread that specimens were forwarded to him from every quarter of the globe. Everything that was new to him was subjected to his keen knife and keener observation. A note in Mrs. Owen's diary is as follows:—"The defunct rhinoceros (late of Wombwell's menagerie) arrived while R. was out. I told the men to take it right to the end of the long passage where it now lies. As yet I feel indifferent, but when the pie is opened—." Six days later she writes:—"R. still at the rhinoceros."

The story of Owen's clever deduction as to the presence of the remains of a large terrestrial bird as large as an ostrich in New Zealand, is given in full by his biographer. It is an excellent example of the application of his powers of observation as well as of his method of ratiocination. From a fragment of bone only six inches in length he reconstructed the skeleton of the *Dinornis* which was

afterwards to be found. No wonder the Committee of the Zoological Society refused to endorse this bold conclusion, and only with hesitation consented to publish his paper in the 'Transactions' with the proviso that the responsibility of it rested exclusively with the author. The subsequent verification of his conclusions was so complete that when a perfect femur arrived, and was placed over the drawing of one made by him, when he was in possession of the small fragment only, they coincided perfectly.

The round of scientific work, followed with such zest, was, nevertheless, not allowed to become the round of life. Science never caused him to degenerate, as it has caused so many others, into a bore. If Carlyle, whose keenness of scent for every species of cant was so pronounced, could speak of him as a man who "was neither a fool nor a humbug," there is every reason to believe that the negative praise was thoroughly deserved. Owen was a confirmed but discriminating novel-reader; a proficient chess-player, a cultured musician, being a good executant upon the 'cello, and a frequenter of the playhouse. Being thus a man of taste, and having secured an early introduction into the best society of London, he was in constant requisition at all the society functions of his day.

A considerable share of work in connection with the organisation of the Great Exhibition of 1851 fell to his lot. He was also a Juror of the Universal Exhibition of Paris in 1855. For his services in connection with this he was created a Knight of the Legion of Honour.

In 1856 Owen was appointed to the new office of Superintendent of the Natural History Department of the British Museum. This was done at the suggestion of Lord Macaulay, whose attention had been drawn to the possibility of this department being neglected unless placed under the control of a man of science. Macaulay was also actuated by a desire to make suitable provision for Owen, who, he wrote, "is an honour to our country. . . . A poet, a novelist, an historian, a painter, a sculptor, who stood in his own line as high as Owen stands among men of science could never be in want except by his own fault. But the greatest natural philosopher may starve while his countrymen are boasting of his discoveries, and while foreign academies are begging for the honour of being allowed to add his name to their lists."

Wisely, we think, has his biographer devoted a chapter to the account of Owen's scheme for a natural history museum which should be of adequate proportions and of suitable arrangement for such a display of the large collections of specimens which were stored away in Bloomsbury as should be at once interesting to the ordinary visitor, educational for the student, and easy of access to the scientific worker. After twenty-five years' advocacy of his scheme, and of fluctuating hopes and fears, begotten of our system of party politics, Owen was permitted to realise in large measure his desires in the form of the present Natural History Museum at South Kensington. A fitting memorial of a devoted scientist!

When the Prince and Princess of Wales visited Egypt in 1869 Owen was asked to join the party. The extracts taken from the letters he wrote upon this occasion consist largely of gossip items of a very pleasing character. One of these tells how

M. de Lesseps endeavoured to play a trick upon him. Describing his visit to the Suez Canal, he writes:—"The steamer had taken us to sea so that we might view the piers of huge artificial blocks of stone intended to keep open the entry of the harbour. We then returned to inspect the artificial stonework. M. de Lesseps, with an innocent air, brought me a piece of stone with some shells embedded in it, and asked me what formation it belonged to. I said it was the most recent I had seen, and from the fossils evidently new to geology. On the whole, I should describe it as *la formation Lessepsienne*, which pleased the old gentleman amazingly."

With the year 1883 Owen ended his official connection with the Natural History Museum, and retired to his home—Sheen Lodge, with its beautiful garden, to spend his declining years in peaceful enjoyment of such simple pleasures as are compatible with the burden of fourscore years. It was meet that nine quiet years should round off to completeness the otherwise arduous life of this truly great scientist.

Some notion of the magnitude of his labours may be gathered from the forty-nine pages chronicling the six hundred and thirty-eight articles contributed by him to general and scientific literature. Four pages are occupied with a list of the various distinctions conferred upon him.

Professor Huxley has contributed a lengthy chapter on "Owen's Position in the History of Anatomical Science," from which it appears that it is upon Owen's discoveries in anatomy and palæontology rather than upon his philosophical speculations that his reputation will find its foundation. "His claims to high place among those who have made great and permanently valuable contributions to knowledge remain unassailable."

PHARMACOPŒA NORVEGICA.*

EDITIO TERTIA, 1895.

(Concluded from page 1000.)

LANOLIN melts when heated on a water bath and separates into two layers (water and wool-fat); heated till the weight is constant should not lose more than 30 per cent. If 10 grammes of lanolin are melted over a water bath with 50 grammes of water, the aqueous layer filtered and evaporated to dryness, should leave no residue.

LINCTUS BORACINUS.—Borax, 1; glycerin, 9.

LIQUOR ANTISPASTICUS.—Liquor ammonii succinici pyroleosi, 1; spiritus æthereus, 1.

LIQUOR KALI ARSENICOSI.—Arsenious acid, 1; carbonate of potassium, 1; water, 5; warm till dissolved, add tincture of gentian, 5; and water to 100.

LIQUOR OPHTHALMICUS (eye water).—Sulphate of zinc, 2; rose water, 1000; opium wine (containing saffron), 10.

LIQUOR PECTORALIS (chest drops).—Extract of liquorice, 1; fennel water, 3; anisated ammonia, 1.

MIXTURA ACIDA.—Dilute sulphuric acid (10 per cent. SO_3), 1; water, 40; raspberry syrup, 9.

MIXTURA ACIDI HYDROCHLORICI.—Dilute hydrochloric acid (10 per cent. HCl), 1; water, 40; raspberry syrup, 9.

MIXTURA ALBA (chalk mixture).—Precipitated carbonate of calcium, 3; powdered gum, 3; water, 88; white syrup, 3; spirituous cinnamon water, 3.

MIXTURA APERIENS (aperient mixture).—Tartrate of potassium, 3; water, 7; rhubarb drops (inf. rhei alk.) 10.

OLEUM HYOSCYAMI is prepared by using ammonia (Dieterich's method); henbane, 50 parts, are warmed with spirit 100, and ammonia 1 for twelve hours; 250 of olive oil are then added, and the whole heated on the water bath until the spirit is dissipated; press out the oil and filter.

All other "olea infusa" are prepared in the same way, but ammonia is used only for those that contain alkaloid.

PILULÆ COLOCYNTHIDIS COMPOSITÆ.—Powdered colocynth, 6; aloes, 12; scammony resin, 12; oil of cloves, 2; tallow, 9; glycerin, 9; make into pills weighing 0.1 gramme each.

PILULÆ BLAUDII.—Powdered crystallised sulphate of iron, 15; powdered carbonate of potassium, 15; powdered liquorice root, and glycerin *q.s.*, are made into 100 pills (Pilulæ Blandii majores), or 150 pills (Pilulæ Blandii minores).

PILULÆ FERRI COMPOSITÆ.—Powdered crystallised sulphate of iron, 1; powdered carbonate of potassium, 1; powdered myrrh, 2; make into pills weighing 0.2 gramme each.

PILULÆ FERRI IODATI (Blancoardi).—Powdered iron, 2; water, 4; iodine, 4; powdered sugar, 4; rub in a mortar till the iodine is dissolved, and add powdered althæa, 2; powdered liquorice root *q.s.*, to form 100 pills (each containing 0.05 gramme ferrous iodide).

PILULÆ TONICO-NERVINÆ.—Powdered crystallised sulphate of iron, 5; powdered asafoetida, 5; extract of gentian, 5; to form 100 pills.

PULVIS IPECAQUANHA OPIATUS (pulvis cephaëlidis opiatus; pulvis thebaicus).—Ipecacuanha, 1; opium, 1; sulphate of potassium, 8.

PULVIS REFRIGERANS (cooling powder).—Lemon oleo-saccharate, 12; powdered nitre, 12; powdered bitartrate of potassium, 76.

SACCHARINUM.—Heated in a glass tube, saccharin melts, darkens in colour, and gives off an odour of oil of bitter almonds. Heated with hydrate of calcium ammonia is evolved. If the residue, after igniting 0.1 gramme of saccharin with 0.5 gramme carbonate of sodium, is extracted with water, the filtrate acidified with nitric acid yields a white precipitate with nitrate of barium. A solution of saccharin in concentrated sulphuric acid assumes at most a pale yellow colour when heated in a water bath (test for sugar). Saccharin should not yield more than 1 per cent. of ash when ignited.

SYRUPUS ALTHÆÆ.—Sliced marshmallow root, 1; cut liquorice root, 1; are washed with water and allowed to stand for two hours with 20 of water, and frequently stirred; press, strain, and boil with sugar 30.

SYRUPUS MYRTILLI.—Whortle berries are crushed, allowed to ferment, pressed and filtered; 2 parts of the juice are boiled with 3 of sugar.

SYRUPUS PECTORALIS (cough syrup).—Hypophoe-

* Translated from the *Pharmaceutische Centralhalle*.

phite of calcium, 30; sugar, 1239; water, 700; to make a syrup to which a solution of sulphate of morphine, 1, in bitter almond water, 30, is added.

SYRUPUS SENNÆ MANNATUS.—Crushed fennel, 1; cut senna leaves, 10; manna, 15; boiling water, 50; allow them to stand two hours, stirring frequently, then press, filter, and boil with sugar, 30.

SPECIES AMARÆ.—Equal parts of rasped gualacum wood, crushed juniper berries, cut buck bean, and cut senna leaves.

SPECIES DEMULCENTES.—Crushed hemp seed, 3; cut mallow herb (leaves and flowers), 3; cut marsh-mallow root, 3; cut liquorice root, 1.

SPECIES JUNIPERI.—Crushed anise, 1; cut liquorice root, 1; crushed juniper berries, 8.

SPECIES LAXANTES HAMBURGENSES.—Cut senna leaves, 60; manna, 25; crushed coriander, 8; powdered bitartrate of potassium, 7.

SPECIES PECTORALES.—Crushed anise, 2; cut elder flowers, 3; cut coltsfoot leaves, 3; cut marshmallow root, 6; cut liquorice root, 6.

SPECIES RESOLVENTES.—Wormwood herb, 5; balm, 5; peppermint, 5; marjoram, 5; chamomiles, 2; lavender flowers, 2; elder flowers, 1; all cut.

TINCTURA AMARA.—Anise, 1; unripe oranges, 3; buck bean, 3; gentian root, 3; wormwood, 10; dilute spirit, 100.

TINCTURA OPII BENZOICA.—Oil of anise, 2; camphor, 3; sublimed benzoic acid, 5; tincture of opium (1:10), 50; diluted spirit, 940.

TINCTURA RHEI AMARA.—Cardamoms, 1; gentian root, 4; rhubarb, 10; dilute spirit, 100.

UNGUENTUM HYDRARGYRI.—Tallow, 1; lard, 3; mercury, 1 (=20 per cent.).

UNGUENTUM PLUMBI ACETICI.—Yellow wax, 5; olive oil, 14; powdered acetate of lead, 1.

UNG. PLUMBI ACETICI COMPOSITUM (unguentum hæmorrhoidale).—Powdered saffron, 1; powdered camphor, 2; henbane oil (1:5), 4; lead ointment (*vide ante*), 18.

UNGUENTUM AROMATICUM.—Lard, 60; tallow, 20; yellow wax, 10; laurel oil, 5; oil of rosemary, 2; oil of juniper, 2; oil of lavender, 1.

UNGUENTUM BASILICUM NIGRUM.—Colophony, 3; yellow wax, 3; pitch 3; tallow, 3; turpentine, 3; olive oil, 10.

VINUM CHINÆ.—Coarsely powdered cinchona (succirubra) bark, 50; citric acid, 1; spirit, 20; Malaga wine, 1000.

VINUM OPII CROCATUM (essentia opii crocata; vinum thebaicum crocatum).—Coarsely powdered opium, 15; cinnamon, 1; cloves, 1; saffron, 5; Malaga wine, 150.

OL. RICINI in a prescription has been interpreted **OL. PINI** by a New York druggist, who consequently added 3 drachms of *ol. pini canadensis* to a mixture of syrup of ipecac., sweet spirit of nitre, and syrup of tolu, intended for a child three months old. Two doses were given, the child died within twelve hours, and the father now sues doctor and druggist for \$25,000 each.

THE SOLUBILITY OF COAGULATED ALBUMIN IN DILUTED HYDROCHLORIC ACID.

BY C. D. MOFFAT.

In a paper on the above subject, by Dr. Harding (*Ph. J.*, liv., 514) some statements were made which, being contrary to generally accepted notions, seemed to call for further investigation. The author—assuming as a fact that, when 200 grains of coagulated egg albumin is mixed with 2 fluid ounces of 0.2 per cent. hydrochloric acid and macerated at a temperature of 100° to 105° F. for five to six hours, 126 grains of the albumin is digested—comes to the conclusion that pepsin must play but a very small part in the digestion of albumin. In order to clear up this point a series of experiments was conducted on exactly similar lines. First, tests were carried out in which 25, 50, 100, and 125 grains respectively of coagulated egg albumin were mixed with 2 ozs. of acidulated water of the above strength and macerated on a water bath, the time being five hours and the temperature 100° to 104°. Further, the other conditions were most favourable for solution, the albumin having been twice passed through the sieve and triturated with the acidulated water. At the end of the time no apparent solution of albumin had taken place. The liquid decanted from the albumin was in each instance tested for syntonin by the customary reagents, such as ammonium sulphate, nitric acid, and the copper sulphate test, but no affirmative results were obtained.

Tests were then made with 200 grains and 1 grain respectively of albumin, mixed with the same quantity of acidulated water as before and macerated for six hours at a temperature of 100° to 104° F., a blank experiment being also carried out at the same time with 1 grain of albumin in distilled water. In the second and third case no solution of albumin was affected in either instance, but on filtering off the residue left from the 200 grains of albumin in the first instance, and evaporating the filtrate to dryness, a residue representing a solution of about 6 grains of albumin was obtained.

The only way in which it is possible to account for the extraordinary results mentioned in Dr. Harding's paper is to suppose that his method of determining the solubility of the albumin was to weigh the residue of the maceration. This is obviously incorrect, owing to the variable amount of water contained in the coagulated egg albumin before and after maceration. If this plan be adopted the water must be determined in both cases, and allowance made for it.

As above mentioned, about 3 per cent. of albumin is dissolved when the acidulated water has a large quantity of albumin to work on, but when present only in small proportions solution is *nil*. It may be mentioned that the filtrate from the undissolved albumin gave all the reactions for syntonin when tested with the usual reagents.

METALS that are readily attacked by reagents are found by Dr. Meade Bolton (*Inter. Med. Mag.*) to exhibit a marked inhibitory action upon the growth of bacteria.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MAY 18, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to the Publishers, 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased, and to whom Cheques and money orders should be made payable.

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

PHARMACOPOEIA NORVIGICA.

At a moment when the issue of new pharmacopœias appears to be the order of the day, the publication of the third edition of the Norwegian Pharmacopœia is not without interest. In one respect at least, viz., its size, the work offers an agreeable contrast to some of its bulky contemporaries, and suggests the vigorous application of the pruning knife in the revision of our own, which at present contains nearly double the number of preparations. The principal object of a pharmacopœia may be assumed to be the definition of medicines, and the more accurately the medicines it contains are defined the more completely does the pharmacopœia in this respect attain its object. But the definition of medicines should not be limited to tests of identity and purity; it should include a nomenclature of such a nature that both prescriber and dispenser may be protected from error, the former in the name by which he designates the preparation he wishes to administer, the latter in interpreting the intention of the prescriber.

Manufacturing processes for chemicals having been omitted from the Norwegian Pharmacopœia, an increased stringency in the tests might reasonably be expected. Such, however, does not appear to be the case; only two drugs are required to yield when tested by specified methods minimum amounts of active principle, a limitation to be carefully distinguished from standardisation. Red cinchona bark should not yield less than 4 per cent. of total alkaloids, nor opium less than 10 per cent. of morphine. And for many highly active drugs the tests of identity and purity must be regarded as lamentably deficient. Several of the synthetic remedies have found a place in the work; amongst them may be noted acetanilide,

antipyrin, phenacetin, saccharin, salol, sulphonal. But the list of vegetable drugs appears somewhat meagre; of barks only seven are official; of roots and rhizomes, sixteen; of seeds and fruits, twenty. Much to be commended is the uniform strength and method of preparation of infusions and decoctions, by which useless repetition is avoided.

The nomenclature, however, can scarcely be regarded as satisfactory. Most dispensers will regard "cocainæ hydrochloras," "apomorphinæ hydrochloras" as more satisfactory designations than "chloratum cocaicum," "chloratum apomorphicum," in which the name of the more important constituent occupies the less conspicuous position. To the English pharmacist also the Norwegian Pharmacopœia will probably appear generally behind the times. The definition of the medicines is lax; there is not a single attempt at standardisation, the nomenclature is an undesirable one, and although the book may contain here and there a feature worthy of consideration by those entrusted with the compilation of a pharmacopœia, it has little claim to pose as a model of what a pharmacopœia should be.

THE REDUCTION IN THE SPIRIT DUTY.

THE announcement by the Chancellor of the Exchequer of the reduction in the spirit duty will be none the less welcome to chemists because it was expected. It was distinctly stated last year that the increase of sixpence per proof gallon was only intended to meet special exigencies, and that it would not be permanently enforced. This was also borne out by the Act under which it was imposed, and had it been intended to continue the increase it would have required re-enacting. Apart from the opposition which a continuance of the higher rate of duty would probably have provoked, there was no special inducement to lead Sir WILLIAM HARCOURT to alter his previously expressed determination. The extra sixpence was expected to yield a sum of nearly £750,000, whereas it only yielded some £200,000. In the opinion of the financial advisers there is every reason to believe that the increase of £200,000 in the revenue from the consumption of spirits would have been attained without the additional duty.

A similar instance occurred whilst Mr. CHILDERS was Chancellor of the Exchequer. An increased duty on tobacco failed to yield the expected increase to the revenue, and the succeeding year when the duty was lowered again the consumption increased, and the Revenue returns were in consequence augmented to the desired extent. It is probable, therefore, that the conviction has forced itself upon the mind of the Chancellor of the Exchequer that 10s. 6d. per proof gallon is as much duty as spirits will conveniently bear, without a sensible decrease in the consumption. This

conclusion will be most satisfactory to those who feel that increase in the spirit duty falls unfairly on pharmacists.

It is not so generally known that the reduction in duty does not come into force until July, although the increased rate took effect from the evening of the 1894 Budget speech. The object of this was to enable the Revenue to collect the duty for twelve clear months. It was well known that large quantities of spirits were cleared out of bond just prior to last year's Budget in anticipation of an increase in the duty. It was hardly likely, however, that any dealer or manufacturer would clear as much as three months' consumption, so that the prolongation of the period of increased duty until July enables the Revenue to effect their object.

NATIVE PRODUCTS OF SIAM.

IN the report of M. DE BUNSEN to the Foreign Office, on the trade of Siam for the year 1893, it is pointed out that the greater part of the country being covered with dense jungle, the list of exports naturally includes an infinite variety of jungle products, such as the horns of buffalo and rhinoceros, benzoin, the hides, sinews and horns of deer—all important items of the Chinese pharmacopoeia; stick-lac, edible birds' nests, cotton, mangrove bark, raw silk, armadillo skins, kingfishers' feathers, ivory, and gamboge. The most important and interesting are ivory, benzoin, stick-lac, and gamboge. The export of ivory was sixty-four piculs, or about four tons, valued at \$17,772, or £2289. Of this sum seven-eighths went to Hong-Kong. Of benzoin, 319 piculs, or nearly 20 tons, figure in the export list, valued at \$21,005, or £2,713. This valuable resin, it is pointed out, is also a product of the east bank of the Mekong, and is interesting as being confined to a narrow zone of forest-clad hill country to the east of Luang Prabang, lying between the 19th and 21st degrees of north latitude and longitude east 102 to 105. About three-fifths of the product reaches Bangkok by way of Nan, and the remainder by way of Nongkhai and Korat. The French occupation of Luang Prabang seems as yet to have caused no perceptible effect on the Bangkok export of benzoin beyond enhancing local prices, but with the completion of new roads already initiated by the French with a view to speedier communication between Luang Prabang and Tonquin, Bangkok exporters (chiefly British) are said to have well-founded fears lest the trade be diverted entirely from Bangkok to Hanoi. "The whole of the Bangkok export goes to the London market and then to France and Belgium to be manipulated into balsam. A small quantity is used locally for frankincense. Prices during 1893 were bad, first-class gum-benzoin fetching 125 ticals per picul (or about £165 per ton), and the second class, forty-five ticals per picul (about £40 per ton). The good quality known to buyers as 'bold blocky almondy' was scarce."

Gamboge is perhaps the next most interesting of the Siamese native products. It is indigenous only in the islands and the sea coast of the Gulf of Siam lying between the 10th and 12th degrees of north latitude. The heavy rainfall of this coast appears to be necessary to the existence of the tree, which is known locally as "Ton Rong." It is found only in the islands of Koh Chang, Koh Kong, and

Koh Rong, and on the mainland of the Indo-Chinese Peninsula opposite those islands. The trees grow to the height of some 50 feet, and are straight-stemmed with no lower branches, owing probably to the dense shade of the forest in which they grow. None of those seen by the Consul had a diameter of more than 12 inches. Ten years' growth is said to be required before the tree is ready for tapping. The Cambodian and Siamese islanders in the rainy months from June to October, when the sap is vigorous, cut a spiral line round the trunk from a height of some 10 feet downwards to the ground. The resin wells out of the bark and trickles down these grooves in a viscid stream, into a hollow bamboo placed at the base of the tree. From this it is decanted into smaller bamboos, where it is left for about a month to solidify. To effect removal, the bamboo is placed over a red-hot fire, and the husk cracking off, "pipe" gamboge remains. The trees can be tapped two or three times during the season, and their trunks subsequently present a curious network of intersecting spirals. Care has to be taken to prevent the rain-water mixing with the resin in the grooves, as any mixture of water causes honey-combing and black discoloration, and a consequent depreciation of from 20 to 30 ticals (£2) per picul in value. "The most valuable gamboge is that which is the least honey-combed or discoloured, and is all the more difficult to obtain, considering the period of heavy rains during which the resin is extracted. The bamboos contain on an average rather less than 1 lb. of gamboge, or about 170 bamboos to the picul. The price asked by the pickers themselves is at the rate of 2 ticals (3s.) for five bamboos full, and the local price is at the rate of 2 ticals (3s.) for three, or 65 ticals (£4 18s.) per hundred, or about £8 7s. per picul. The whole output is sold to local Chinese traders and taken by sailing boat to Bangkok."

COMPLIMENTARY DINNER TO THE PRESIDENT OF THE NEW YORK COLLEGE OF PHARMACY.

THE presence in London of Mr. S. W. FAIRCHILD has been very agreeably made the opportunity for establishing a personal acquaintance between him and a number of British pharmacists, manufacturers, and others connected with the drug trade in London. With that object Mr. H. S. WELLCOME invited a large party to dinner on Tuesday evening at the Holborn Restaurant, the guests, including the President and Secretary of the Pharmaceutical Society, Mr. ERNEST HAET, the Editor of the *British Medical Journal*, and several other medical men. Mr. FAIRCHILD, who is a member of the firm of FAIRCHILD BROS. & FOSTER, the manufacturing chemists of New York, is well known in connection with the production of digestive preparations, and has taken an active part in promoting pharmaceutical education at the College of which he is now the President. From the time that he and Mr. WELLCOME were pupils together at the Philadelphia College they have been more or less closely associated in business, and the compliment paid to Mr. FAIRCHILD on this occasion by his old colleague must have been as gratifying to him as it was to those who had the pleasure of making his acquaintance and of sharing Mr. WELLCOME's hospitality.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Thursday, the 9th inst., the Librarian and Curator presented the following reports of donations to the Society's Library, Museum, and Herbarium:—

To the Library (London).

- College of Preceptors, London:
Calendar, 1895.
Radcliffe Library, Oxford:
Catalogue of Books added during 1894.
Messrs. W. and G. S. West, Bradford:
Some recently published Desmidia, 1895.
Mr. Francis Watts, Antigua:
Supplement to Leeward Islands Gazette.
Agricultural Gazette of the Leeward Islands, No. 3 and Supplement.
Mr. W. Martindale, London:
Extra Pharmacopœia, 8th ed., 1895.
Dr. E. A. Philippi, Santiago:
Plantas nuevas Chilenas, 1894.
Dos palabras sobre la sinonimia de los crustáceos decápodos braquiuros o jaivas de Chile, 1894.
Mr. Walter Hills, London:
Berichte der Deutschen Chemischen Gesellschaft, 1894.
Mr. F. J. Hanbury, London:
London Catalogue of British Plants, 9th ed., 1895.

To the Museum (London).

- Mr. G. F. Scott Elliot, Chelsea:
"Ogolo" and "Mwavi" barks, and "Mutiri" root from Uganda.
Mr. J. H. Maiden, Curator, Technological Museum, Sydney:
Seeds of *Araucaria bidwillii* and *Hicksbeachia pinnatifolia*.
Dr. A. Henry, London:
Wood of *Eucacaria agallocha*, used in China as a substitute for aloe wood; Camphor oil from Takow, Formosa.
Sir F. von Mueller, K.C.M.G., F.R.S., LL.D., Melbourne:
Resin of *Xanthorrhoea arborea*; kino of *Eucalyptus calophylla*.
Mr. E. J. Irving, West Australia:
Specimens of *Gastrolobium grandiflorum*, a "Poison Bush" fatal to live stock.
Mr. Thos. Hanbury, F.L.S., Ventimiglia:
Crayon Portrait of the late Daniel Hanbury.

To the Herbarium (London).

- Mr. J. H. Maiden, Sydney:
Forty-four species of *Eucalyptus*, nine of *Acacia*, and eighteen other medicinal plants.

To the Library (Edinburgh).

- Mr. W. Martindale, London:
Extra Pharmacopœia, 8th ed., 1895.
To the Museum (Edinburgh).
Messrs. Hodgkinsons, Treacher and Clarke, per Mr. Ward, 101, Whitecross Street, London, E.C.:
Specimens of Bombay, Canadian, Dutch, English, Russian, South American, and Turkish Linseeds; and Senna pods.
Mr. John Macdonald, 56, Newington Road, Edinburgh:
Photographs of the Pelican Flower (*Aristolochia gigas*).

EVENING MEETING IN EDINBURGH.

Friday, April 26, 1895.

MR. J. LAIDLAW EWING IN THE CHAIR.

(Concluded from page 975.)

The next communication read was on—

SMALLER-SIZED PHARMACOPOEIAL PILLS.

BY WILLIAM LYON.

At our February meeting, Dr. Stockman gave expression to the opinion that it would be an improvement, if, by leaving out some of the unimportant ingredients, the dose of the Pharmacopœia pills could be reduced, as many people had great difficulty in swallowing one or two five-grain pills. Several other eminent authorities having expressed themselves similarly, it is our duty as pharmacists to consider how it can be done, and it was with the intention of initiating a discussion on the subject rather than of laying down definite formulae that experiments were made, the results of which are embodied in this paper.

In endeavouring to reduce the size of the pills several well-known and otherwise satisfactory excipients have to be set aside, as too large a bulk of them is required to give a satisfactory mass. Thus confection of roses, confection of hips, treacle, glycerin of tragacanth, and glucose are usually ineligible, and search has to be made for suitable substitutes. In the case of glycerin of tragacanth the objection is removed by increasing the quantity of glycerin 25 per cent. This modification of the B.P. formula gives a most useful excipient.

The disintegration test mentioned below was carried out as follows: One pill was put into a test tube along with two fluid drachms of water containing .02 per cent. of hydrochloric acid, the test tube placed in water (at 100° Fah.) and agitated at regular intervals. At the end of an hour, if the pill had not entirely disintegrated in that time, the residue was removed and examined. Whilst the foregoing cannot be said to afford any reliable criterion of what would take place in the stomach, still it is of some value as a comparative test.

Pil. Aloes Barb.—With nearly two and a half grains of aloes in each five-grain dose it is hardly to be expected that a small pill can be made. If, however, half a grain of aloin may be taken as therapeutically equal to two grains of aloes (the B.P. gives half a grain and two grains respectively as the minimum dose), a mass can be made every two grains of which are equal to five grains of B.P. mass.

	Parts.	Approximate Quantity in a 5-grain pill.
B.P. Barbadoes aloes		
in powder	16	2·4
Hard soap in powder	8	
Oil of caraway	1	·15
Confection of roses...	8	
Dose, 5 to 10 grains.		

	Parts.	In a 4-grain pill	
I. Barbadoes aloes in powder	103	2'4	Mass hard and crumbly when kept for some time, but when worked up in a mortar its plasticity returns sufficiently to allow it being rolled out into pills. Pills keep their shape well.
Hard soap in powder	47		
Oil of caraway	7	16	
Compound decoction of aloes	10		
Or a sufficiency.			

		In a 4-grain pill.	
II. Barbadoes aloes in powder	14'5	2'4	Mass does not harden on keeping. Pills retain their globular form and do not adhere to one another. Preferable to I.
Hard soap in powder	5'25		
Oil of caraway	1	16	
Glycerin of tragacanth (new)	3		
Or a sufficiency.			

		In a 2-grain pill.	
III. Aloin	4'5	63	Mass good, and though it gets rather hard on keeping, it softens when worked up in a mortar.
Hard soap in powder	7'5		
Oil of caraway	1	13	
Compound decoction of aloes	1'5		
Or a sufficiency.			

		In a 2-grain pill.	
IV. Aloin	4'25	61	Mass and pills both good. Preferable to III.
Hard soap in powder	7'75		
Oil of caraway	1	14	
Glycerin of tragacanth (new)	75		
Or a sufficiency.			

The B.P. pill took twice as long as the others to disintegrate, it however had been kept for a somewhat longer time.

Pil. Aloes et Asafet.—By reducing the quantity of soap and using liquid excipients the dose can be reduced to either four or three grains, and by using aloin in place of the aloes the dose is still further reduced to two grains.

	Parts.	Approximate quantity in a 6-grain pill
B.P.		
Socotrine aloes in powder	1	1'25
Asafetida	1	1'25
Hard soap in powder	1	
Confection of roses..	1	
Dose, 5 to 10 grains.		

		In a 4-grain pill.	
I. Socotrine aloes in powder	8'75	1'25	Mass on keeping gets somewhat harder than is desirable, but otherwise satisfactory. Pills all right.
Asafetida	8'75	1'25	
Hard soap in powder	7'5		
Syrup	3		
Or a sufficiency.			

	Parts	In a 4-grain pill.	
II. Socotrine aloes in powder	11'25	1'25	Rather harder than I.
Asafetida	11'25	1'25	
Hard soap in powder	2'5		
Compound decoction of aloes	2		
Or a sufficiency.			

		In a 2-grain pill.	
III. Aloin	5'75	31	Pills and mass satisfactory.
Asafetida	23'	1'24	
Hard soap in powder	6'25		
Compound decoction of aloes	2		
Or a sufficiency.			

III. was the only one completely disintegrated within an hour. The disintegration of the other three was only about half completed. Residues of these were fairly firm when pressed with the finger.

Pil. Aloes et Ferri.—Very likely objection will be made to the use of dried sulphate of iron owing to its reputed variable quality. That, however, is an objection easily dealt with. Dried sulphate of iron can be made to meet the Pharmacopoeia requirements, and pharmacists should insist upon it being made. By using the dried sulphate of iron and reducing the quantity of aromatic powder, the minimum dose can be reduced to three grains, or to two grains if the aromatic powder is still further reduced, and aloin used in place of aloes.

	Parts.	Approximate quantity in a 5-grain pill.
B.P. Sulphate of iron	1'5	71
Barbadoes aloes in powder	2'	95
Compound powder of cinnamon	3	1'43
Confection of roses	4	
Dose, 5 to 10 grains.		

		In a 8-grain pill.	
I. Dried sulphate of iron	7'75	43	Very good mass, and pills much better than either II. or III.
Barbadoes aloes in powder	17'	94	
Compound powder of cinnamon	17'25	95	
Glycerin of tragacanth (new)	12		
Or a sufficiency.			

		In a 2-grain pill.	
II. Dried sulphate of iron	100	43	Mass gets somewhat crumbly on keeping, but when worked up in a mortar for a short time its plasticity returns, and it can be rolled out into pills without any difficulty. Pills keep their shape well.
Aloin	56	24	
Oil of cinnamon	1		
Ginger in powder	87		
Cardamom seed, ...	87	75	
Glycerin of tragacanth (new)	130		
Or a sufficiency.			

	Parts.	In a 2-grain pill.	
III. Dried sulphate of iron	10	47	Like II., but it does not become so plastic when it is worked up in a mortar.
Aloin	5.25	25	
Compound powder of cinnamon.....	15.75	75	
Glycerin of tragacanth (new).....	11		
Or a sufficiency.			

B.P., I. and III. were almost completely disintegrated in an hour. II. only about half. The residues, however, very readily broke down when touched with the finger.

Pil. Aloes et Myrrh.—In order to retain the full quantities of the aloes and the myrrh, it is necessary to omit a portion of the saffron, but if aloin is used instead of aloes the full quantity of the saffron can be put in.

	Parts.	Approximate quantity in a 2-grain pill.	
B.P.			
Socotrine aloes in powder.....	2	1.6	
Myrrh aloes in powder.....	1	.8	
Saffron, dried.....	.5	.4	
Treacle.....	1		
Glycerin..... (about)	1.5		
Dose, 5 to 10 grains.			

		In a 2-grain pill.	
I. Socotrine aloes in powder	12	1.6	Good mass, though it gets rather hard when kept for some time.
Myrrh aloes in powder.....	6	.8	
Saffron, dried.....	1.5	.21	
Glycerini	2		
Syrup	1		
Or a sufficiency.			

		In a 2-grain pill.	
II. Socotrine aloes in powder	12	1.6	Mass very hard and flinty, can be reduced to fine powder without difficulty. Pill looks beautiful.
Myrrh aloes in powder.....	6	.8	
Hard soap	1.5		
Glycerin	1		
Compound decoction of aloes.....	1.5		
Or a sufficiency.			

		In a 2-grain pill.	
III. Aloin	5.5	.40	Pills and mass both good. Keep nice and soft.
Myrrh in powder	12	.88	
Saffron dried	6.5	.48	
Glycerin of tragacanth (new).....	8		
Or a sufficiency.			

Neither of them completely disintegrated within an hour.

The residues of the B.P. I. and II. were rather hard, III. quite soft.

Pil. Aloes Socotr.—It is necessary to give formulæ here, for although the ingredients are present in the official pill in the same proportions as in *pil. aloes Barb.*, owing to the oil of nutmeg being of a less adhesive

nature than oil of caraway a larger quantity of a liquid excipient is required, and consequently the quantities of some of the other ingredients are altered.

	Parts.	Approximate quantity in a 2-grain pill.
B.P. Socotrine aloes in powder	16	2.4
Hard soap in powder	8	
Volatile oil of nutmeg	1	.15
Confection of roses..	8	
Dose, 5 to 10 grains.		

		In a 4-grain pill.
I. Socotrine aloes in powder.....	53	2.4
Hard soap in powder	22	
Volatile oil of nutmeg	3.5	1.6
Compound decoction of aloes	9	
Or a sufficiency.		

		In a 4-grain pill.
II. Socotrine aloes in powder.....	14.5	2.4
Hard soap in powder	5.25	
Volatile oil of nutmeg	1	.16
Glycerin of tragacanth (new)	3	
Or a sufficiency.		

		In a 2-grain pill.
III. Aloin	5	.62
Hard soap in powder	7	
Volatile oil in nutmeg	1	.12
Compound decoction of aloes	8	
Or a sufficiency.		

Pil. Asafetida Co.—This pill is a difficult one to deal with. If the myrrh could be considered as non-essential, it would be somewhat easier reducing the size of the pill, but as it is present in the same proportion as the asafetida and the galbanum, apparently it is a principal ingredient. The process detailed below gives a fairly good mass, and the dose would be two to four grains. Whilst it is very probable that pills made by this modification of the official formula would be as active as the official, that would have to be determined before the two could be compared.

	Parts.	Approximate quantity in a 2-grain pill.
B.P. Asafetida	2	1.4
Galbanum	2	1.4
Myrrh	2	1.4
Treacle	1	—
Dose, 5 to 10 grains.		

I. Asafetida	80
Galbanum	80
Myrrh.....	80

Rub them in a mortar with successive portions of rectified spirit until all the soluble matter is removed. Strain the solution through flannel, evaporate on a water bath to a pillular consistence, add 20 per cent. of its weight of hard soap in powder, and mix thoroughly.

Glycerin was tried in place of the soap, but was not nearly so satisfactory.

Pil. Cambogia Co.—By reducing the quantities of soap and aromatic powder, the minimum dose can be reduced to three grains, and to two grains if aloin is used in place of aloes.

	Parts.	Approximate quantity in a 6-grain pill.	
B.P. Gamboge in powder.....	1	·83	
Barbadoes aloes in powder.....	1	·83	
Compound powder of cinnamon.....	1	·83	
Hard soap in powder.....	2		
Syrup (about).....	1		
Dose, 5 to 10 grains			
		In a 3-grain pill.	
I. Gamboge in powder.....	10·75	·84	Mass gets a little hard, but softens on working up in a mortar.
Barbadoes aloes in powder.....	10·75	·84	
Compound powder of cinnamon.....	8	·63	Pills good.
Hard soap in powder.....	6		
Compound decoction of aloes.....	2·5		
Or a sufficiency			
		In a 3-grain pill.	
II. Gamboge in powder.....	11·75	·83	Much better than I.
Barbadoes aloes.....	11·75	·83	
Compound powder of cinnamon.....	6·5	·46	
Hard soap in powder.....	6		
Syrup.....	6		
Or a sufficiency.			
		In a 3-grain pill.	
III. Gamboge in powder.....	10·25	·83	Mass gets soft and sticky, and too much treacle is used for a two-grain dose mass to be obtained.
Aloin.....	2·75	·22	
Compound powder of cinnamon.....	8	·64	
Hard soap in powder.....	6		
Treacle.....	10		
Or a sufficiency.			
		In a 3-grain pill.	
IV. Gamboge in powder.....	12·25	·83	Mass gets a little hard on keeping, but softens when worked up in a mortar.
Aloin.....	3·25	·22	Pills satisfactory.
Compound powder of cinnamon.....	5·5	·37	
Hard soap in powder.....	6		
Compound decoction of aloes.....	2		
Or a sufficiency.			

II. was the only one completely disintegrated in an hour, I. and IV. were almost completed, III. only about half.

The residue of the latter was firm, the two former quite soft.

Pil. Coloc. Co.—If we have to keep to official galenicals it is impossible to reduce the dose of this pill below four grains. Allowed a free hand, however, a three-grain pill can be made by using a powdered extract of colocynth, prepared by macerating powdered colocynth in proof spirit for three days and then percolating until exhausted, recovering the spirit by distillation, and evaporating to dryness. One sample of colocynth thus treated yielded 22 per cent. of dry extractive. The activity of the extract has not yet been determined. That point, as well as the best method of preparing the extract, will be attended to later on when time permits.

	Parts.	Approximate quantity in a 6-grain pill.	
B.P. Colocynth pulp in powder.....	4	·83	
Barbadoes aloes in powder.....	8	1·66	
Scammony resin in powder.....	8	1·66	
Sulphate of potassium.....	1		
Oil of cloves.....	1	·20	
Water (about).....	2		
Dose, 5 to 10 grains.			
		In a 4-grain pill.	
I. Colocynth pulp in powder.....	3·75	·84	Mass gets very hard.
Aloin.....	1·75	·40	Pills are fairly good.
Scammony resin in powder.....	7·25	1·68	
Sulphate of potassium in powder.....	1·75		
Oil of cloves.....	·75	·16	
Water.....	2		
Or a sufficiency.			
		In a 3-grain pill.	
II. Extract of colocynth in powder.....	8·25	·182	Mass keeps much softer than above, but the pills pit a little; not so much, however, as the B.P. pill.
Aloin.....	18·75	·41	
Resin of scammony in powder.....	75	1·64	
Curd soap in powder.....	21·75		
Oil of cloves.....	8	·17	
Water.....	4		
Or a sufficiency.			
			Sulphate of potassium and kaolin were both tried in place of the soap, but they were worse. Though not perfect, II. is a distinct improvement upon the B.P. pill. It is advantageous to allow the mass to stand for a day or longer before rolling out the pills. They do not pit so much if that is done.
			Little or no disintegration had taken place at the end of an hour. The residues, however, were quite soft, especially II.
			<i>Pil. Coloc. et Hyoscy.</i> —The percentage of extract of henbane would be diminished, unless a powdered extract were made official.

	Parts.	Approximate quantity in a 8-grain pill.	
B.P. Compound pill of colocynth.....	2	3.3	1.8 parts of Pil. colo. co. II. minus
Extract of henbane...	1	1.6	water are equivalent to 3.3 parts pil. colo. co. B.P.

I. Extract of colocynth in powder 8.25		
Aloin 18.75		
Resin scammony in powder 75		
Curd soap in powder 21.75		
Oil of cloves..... 8		
Extract of henbane 87.75	1.19	

Good mass, but extracts vary so much that it is impossible to say that the same proportions would always make a good mass.

Pil. Hydrarg.—Dose can be reduced to two grains by using either confection of roses or manna, but there is no apparent advantage in using the latter.

	Parts.	Approximate quantity in a 8-grain pill.
B. P. Mercury.....	2	1
Confection of roses...	3	
Liquorice root in powder.....	1	
Dose, 3 to 8 grains.		

I. Mercury 103	1	
Confection of roses 69		
Liquorice root in powder..... 34		
II. Mercury 103	1	
Manna 95		
Liquorice root in powder..... 8		

Pil. Ipecac. c. Scilla.—By using equivalent quantities of powdered opium and powdered ipecacuanha the dose can be reduced to two grains. The absence of the sulphate of potassium is not likely to make any difference in the action of the pill.

	Parts.	Approximate quantity in a 8-grain pill.
B.P. Compound powder of ipecacuanha	3	2.1
Squill in powder	1	.7
Ammoniacum in powder	1	.7
Treacle (about).....	2	
Dose, 5 to 10 grains.		

I. Ipecacuanha in powder	9	.20	Mass and pills good, and though
Opium in powder	9	.20	slightly harder than
Squill in powder	30	.68	II., are nearer the
Ammoniacum in powder	30	.68	correct strength.
Liquid Extract of liquorice.....	10		
Or a sufficiency.			

II. Ipecacuanha in powder	9	.19	Mass and pills good, but inclined to be sticky.
Opium in powder	9	.19	
Squill in powder	30	.64	
Ammoniacum in powder	30	.64	
Syrup	15		
Or a sufficiency.			

The B.P. pill disintegrated quicker than either I. or II., but both of the latter were almost completely disintegrated at the end of an hour. The residues were quite soft.

Pil. Plumbi c. Opio.—It is neither possible nor necessary to reduce the dose of this pill. A better excipient, however, might be found in syrup, only it makes the pill slightly stronger.

	Parts.	Approximate quantity in a 8-grain pill.
B.P. Acetate of lead in powder	6	2.3
Opium in powder	1	.37
Confection of roses...	1	
Dose, 3 to 5 grains.		
I. Acetate of lead in powder	36	2.3
Opium in powder.....	6	.39
Syrup.....	4	
Or a sufficiency		

I. Disintegrates sooner than the B.P. pill.

Pil. Rhei Co.—There are several methods of reducing the size of this pill, and not much difference in the results. That which necessitates the least possible change from the official formula is likely to be the most acceptable.*

	Parts.	Approximate quantity in a 8-grain pill.
B.P. Rhubarb root in powder	6	1.2
Socotrine aloes in powder	4.5	.9
Myrrh in powder ...	3	
Hard soap in powder	3	
Oil of peppermint ...	33	.06
Glycerin	2	
Treacle.....	6	
Dose, 5 to 10 grains.		

I. Rhubarb root in powder.....	24	1.2	Mass and pills both good.
Socotrine aloes in powder.....	18	.9	
Hard soap in powder	8		
Oil of peppermint...	1	.06	
Glycerin	3		
Syrup	3		
Or a sufficiency.			

II. Extract of rhubarb	8	.4	Mass and pills both good, but not better than I.
Socotrine aloes in powder.....	18	.9	
Myrrh in powder ...	9		
Hard soap in powder	18		
Oil of peppermint...	1	.06	
Glycerin	2		
Syrup	1		
Or a sufficiency.			

* Good rhubarb root is said to yield about 33 per cent. of B.P. extract, or 30 per cent. of dry extract.

	Parts.	In a 2-grain pill.	
III. Powdered extract of rhubarb	7.5	.38	Similar to II.
Socotrine aloes in powder	18	.9	
Myrrh in powder ...	9		
Hard soap in powder	18.5		
Oil of peppermint...	1	.05	
Glycerin	2		
Syrup	3		
Or a sufficiency.			

		In a 2-grain pill.	
IV. Rhubarb root in powder	24	1.4	Similar to I.
Aloin	4	.24	
Myrrh in powder ...	8.5		
Hard soap in powder	8		
Oil of peppermint ...	1	.06	
Glycerin	3		
Syrup	1		

		In a 2-grain pill.	
V. Powdered extract of rhubarb	5.5	.87	Mass keeps nice and soft.
Aloin	8.5	.24	
Myrrh in powder ...	6		
Hard soap in powder	10		
Oil of peppermint ...	1	.06	
Glycerin	1		
Syrup	2		

B.P. I. and IV. disintegrate about the same rate; II., III., and V. quicker than the afore-mentioned.

Pil. Saponis Co.—Dose can easily be reduced to either 2 grains or 1 grain. These would be more in uniform with the usual size of opium pills.

	Parts.	Approximate quantity in a 2-grain pill.	
B.P.			
Opium in powder ...	1	.5	
Hard soap in powder	4		
Glycerin (about) ...	1		
Dose, 3 to 5 grains.			
I. Opium in powder ...	20	.5	When carefully pre- pared this is a good mass, but when kept it gets too soft.
Hard soap in powder	50		
Glycerin	10		
Or a sufficiency.			
II. Opium in powder	20	.5	Much better than above.
Hard soap in powder	55		
Water	5		
Or a sufficiency.			
III. Opium in powder	20	.5	Likewise preferable to I.
Hard soap in powder	16		
Syrup	4		
Or a sufficiency.			

I. disintegrates sooner than II. or III., which are about the same.

Pil. Scammon. Co.—Cannot very readily be made into less than 4-grain pills. Jalapin and scammonin would scarcely be admitted as eligible substitutes.

	Parts.	Approximate quantity in a 5-grain pill.	
B.P. Resin of scam- mony	1	1.5	
Resin of jalap	1	1.5	
Curd soap in powder	1		
Strong tincture of ginger	1		
Rectified spirit	2		
Dose, 5 to 15 grains.			
I. Resin of scammony	12	1.5	Good mass, and does not harden quickly. Pills keep their shape.
Resin of jalap	12	1.5	
Curd soap in powder	6		
Glycerin	1		
Strong tincture of ginger	1		
Or a sufficiency.			
II. Resin of scammony	12	1.2	Becomes rather harder than above when kept. Pills weaker than 5-grain B.P. pills, and are inclined to pit.
Resin of jalap	12	1.2	
Glycerin	2		
Strong tincture of ginger	2		
Or a sufficiency.			

The soap makes the pill disintegrate more rapidly.

Pil. Scilla Co.—Perhaps the ginger is not an essential ingredient, but by employing a more liquid excipient than treacle it can be retained and a three-grain pill made. The soap improves the pill mass considerably.

	Parts.	Approximate quantity in a 5-grain pill.	
B.P. Squill in powder ...	1.25	1	
Ginger in powder ...	1	.8	
Ammoniacum in pow- der	1	.8	
Hard soap in powder.	1		
Treacle	2		
Dose 5 to 10 grains.			
I. Squill in powder	13	1	Good mass and pills.
Ginger in powder	9	.75	
Ammoniacum in pow- der	9	.75	
Hard soap in powder...	3		
Liquid extract of liquorice	3		
Or a sufficiency.			
II. Squill in powder...	24	1.07	Likewise good, but I. preferable.
Ginger	18	.80	
Ammoniacum in powder	18	.80	
Syrup	7		
Or a sufficiency.			
Disintegration about the same.			

Of the remaining pills, pil. phosphori may be passed over, as the dose is small enough already, pil. conii co., pil. ferri carb., pil. hyd. subchlor. co. do not lend themselves readily to reduction, and pil. ferri iodid. and pil. ferri are being investigated and will be reported on next session.

The next communication was a

NOTE ON COMMERCIAL LINSEEDS.

BY A. J. DEY AND W. B. COWIE.

One of the results of the communication read by one of us at the last evening meeting (*ante*, p. 899) has been the donation to the Museum of specimens of the various commercial linseeds as found in the market at the present time. These have been handed to us by Mr. Hill in the belief that a report upon them would be a useful and interesting communication to this meeting.

The comparative size and weight of the different varieties of seed is readily seen by the following figures, obtained by weighing 50 grains of each sample and counting the number of seeds in each. The largest seeds are placed first in order and the smallest last.

South American.....	466 seeds weigh 50 grains.
Bombay	495 " "
Turkish	542 " "
Canadian	684 " "
Dutch	692 " "
Russian	754 " "
English	823 " "

The Russian sample contained about 1.5 per cent. of foreign seeds, including a considerable proportion of cruciferous seeds; the Canadian sample contained about 0.7 per cent. of foreign seeds, including a few apparently grass seeds; and a few cruciferous seeds were seen in the Turkish sample. The South American sample contained a quantity of whitish quartz-like fairly large-sized fragments of stone; the Turkish sample contained some reddish coloured sandy matter; and the Bombay sample contained small fragments of blackish, friable earthy matter. None of the samples gave a perceptible pungent odour indicative of cruciferous seeds, and as these were undoubtedly present in at least two samples, it would appear that the test is not sufficiently delicate for the detection of so small a percentage. Probably, however, it is sufficient to detect such a percentage as would unfit the meal for medical use. Greenish mentions that it may sometimes reach 30 per cent. The cooled decoction of the English and Turkish samples formed a very thick mucilaginous gluey mass, indicating a relatively high percentage of gum. The samples were examined for starch and the percentage of oil and of ash. The results are shown by the following table. Sicilian linseed is not at present met with in the market, its excess of husk is said to be against its use.

The above shows an average of 36.57 per cent. of oil and 2.87 per cent. of ash. In view of this percentage of ash we suggest that the standard maximum ash to be permitted for linseed meal should be 5 per cent. instead of 6 per cent., as suggested by one of us

at last meeting. Mr. Greenish in 1871 ('Year-Book,' 1871, p. 596) states that linseed contains 25 to 30 per cent. of oil, and in a subsequent paper ('Year-Book,' 1884, p. 470) he gives it as 30 to 33 per cent. Our results indicate that 34 to 40 per cent. is nearer the actual figures. The sample of English linseed consisted of much smaller seeds than any of the others, and it will be observed that its percentage of oil, 29.5, excludes it from our suggested standard, 30 per cent., as an official source of linseed meal. Greenish mentions that it is not employed by linseed crushers. The seeds looked immature, and though the cooled decoction did not give a blue starch reaction, a faint purple colour was produced on the addition of the iodine, indicating, probably, the presence of some partially altered starch in some immature seeds. The starch reaction in the Canadian sample was distinct though slight, and very distinct in the Russian sample. These contained 0.7 and 1.5 per cent. of foreign seeds respectively, which seem to have been the source of the starch. The ash of the South American sample was very white; that of the Turkish reddish; and that of the Bombay black, due no doubt to the quartz-like fragments, reddish sandy matter, and blackish, friable earthy matter already noted as being found in these samples respectively.

Sample.	Starch.	Oil p.c.	Ash p.c.	Insoluble in HCl p.c.
English.....	absent	29.5	3.110	0.120
Dutch	"	34.5	1.930	0.144
Turkish	"	36.5	2.788	0.138
Canadian	present	37.0	3.122	0.030
Russian.....	"	39.0	2.718	0.184
South American	absent	39.5	4.063	0.476
Bombay	"	40.0	2.377	0.267

With the exception of the stony and earthy matters already noted, the South American and Bombay seeds were large-sized, of excellent quality, very free from foreign seeds, highly farinaceous, and yielding a high percentage of oil.

The last communication was on—

THE LEGALISATION OF THE METRIC WEIGHTS AND MEASURES.

BY GEORGE LUNAN.

The question of the legalisation of metric weights and measures becomes more urgent in view of suggestions to increase present use of system, or adopt *in toto* in new B.P.

Mr. Umney, on behalf of the London Chamber of Commerce and Drug Club, wrote the Pharmaceutical Council in January, pointing out that a grievance existed from it being unlawful to weigh or measure by this system when wholesale druggists received orders from foreign countries where latter only is used; and the Council agreed to recommend the amendment of Weights and Measures Acts, 1878, and 1889, so as to legalise the metric weights and measures for export trade purposes only (Act to amend the Weights and Measures Acts, 1878 and 1895, see page 588, *Ph. J.*, No. 1281). The Weights and

Measures Act, 1878, gives a table of equivalents (Third Schedule, Part I.), and clause 18 states that "such table may be lawfully used for computing and expressing, in weights and measures, weights and measures of the metric system." From that, it need not be doubted that it is illegal to use metric weights and measures for purposes of commerce. The question of legalising the system is surrounded with difficulties, even though we are agreed that its principle is scientific, its use simple, and its increasing recognition compels us to believe that it must ultimately be adopted. It will be difficult to obtain legal power, specially for weights and measures for the purposes of dispensing, without at the same time legalising for general use, and this will call forth strong opposition. Without legal authority for actual weights not equivalents in grains, etc., we cannot put processes for quantitative estimations in B.P.—a very desirable improvement—in metric weights and measures. The maximum dose in metric equivalent could be stated if it were legal to use the weights and measures, were it not that an alternative dose would involve at least three or four figures to fairly express present equivalents.

It would be an advance, and would lead to greater familiarity with metric weights and measures if the system could be legalised for the purposes of the quantitative estimations, and that at present is as much as we can expect to be done by the compilers of the new Pharmacopœia.

The discussion on the three preceding papers was taken together.

Mr. DOTT said he did not think aloin could be quite easily taken as a substitute for aloes, as the equivalent of the one to the other had not yet been clearly established. He thought also that in many cases a smaller dose of aloes would be sufficient, and if anyone wished to take a larger dose it was a simple matter to take two pills.

Mr. MACKENZIE said he thought this paper was a step in the right direction. Those engaged in dispensing knew that the use of aloin was an effectual means of removing the objection to aloes, namely, its offensive taste and smell. He was not sure that he agreed with all that had been said, but he thought there was a decided tendency nowadays to greatly reduce the size of all pills.

Mr. HENRY said, considering what had recently been said about polypharmacy, it was a question whether aloin would be accepted. This paper was a very useful one indeed, and should receive the careful attention of those who were to deal with this matter. He was not in favour of the formula for pil. asafoetidæ co., for it could not be conducted in an ordinary pharmacy without a fume chamber. He had also found that the use of syrup as an excipient had a tendency to cause pitting of the pills.

Mr. LUNAN said there were some objections to the use of very small pills, and related the case of a lady who professed to obtain great benefit from a small liver pill, which was found next day in her false teeth. No doubt the tendency now was to elegance

in pharmacy, but they should not forget that there were objections to very small-sized pills. They might get lost, and sometimes contained very potent medicines such as strychnine.

Mr. RUTHERFORD HILL said he had gone carefully over this paper on pills, and the work had all been very carefully done, and well deserved attention.

Mr. COULL said he thought one objection to the proposed formula for pil. asafoetidæ co. was the evaporation of the alcoholic solution, which would cause loss of the active constituent, volatile oil.

Mr. HENRY said, with reference to the note on linseeds, he had that day examined his own stock, and found that 288 seeds weighed 50 grains. Evidently they were much larger than any of the samples reported on, but he did not know the source of them.

Mr. MACLAREN said Mr. Lunan had raised the question about weights and measures, but he did not gather that he had any proposal of his own to make. He noticed that in price-lists certain goods were frequently quoted in metric weights, and if that was not legal the attention of the parties doing so should be drawn to it.

Mr. FORRETT said he had been unable to follow Mr. Lunan. At present they could use metric weights in volumetric analysis, and he did not see why he spoke of legalising their use.

Mr. MACKENZIE said he thought they were not yet by any means ready for a general adoption of these French weights and measures in ordinary commerce in this country.

Mr. DOTT said there were two distinct questions raised, namely, the compulsory use of these weights and measures, and the legalising of their use in the manner suggested by Umney and others. They could not, for instance, weigh out for sale a kilogramme of any article, but they could use the equivalent of a kilogramme in imperial weights. With regard to the difficulty of giving the equivalent of doses in the metric system, it was not necessary to have the exact equivalent, as suggested by Mr. Lunan, and it was not necessary to have two or three decimal figures.

Mr. HILL said it was proposed by Mr. Umney and others that the use of metric weights and measures should be made legal for export trade, so as to enable exporters to execute certain orders from foreign countries. Just now no one could legally sell by retail a gramme of sulphate of quinine or a litre of, say, turpentine. He understood Mr. Lunan's suggestion in this direction to be the general legalisation of these weights for all trade purposes, and not merely for export. It was not a compulsory use, but merely a permissive power, that was asked, and he saw no objection to that being granted.

Mr. LYON, in reply, said if the quantity of aloin he suggested was too large, it could easily be altered. The question as to the equivalence of aloin and aloes was for the medicals to settle; as to the formula for pil. asafoetidæ co., he would point out that the present formula was open to the same objection as the ingredients were ordered to be treated with treacle till liquefied. He had not found that pills made with syrup pitted.

Mr. LUNAN, in reply, said he wished the new Pharmacopœia to contain the metric system for the making of official tests, and he did not think that could be done till it was legalised. He did not see why the grain system should have the premier place in the Pharmacopœia. It was quite true that at present we cannot sell anything by retail by using the metric weights. The difficulty about equivalents would be seen if the dose ran up to, say, one ounce, which would be equal to 28·287 gramme.

On the motion of the Chairman, a cordial vote of thanks was awarded to the authors of papers.

The Assistant-Secretary said, by the kindness of Mr. W. W. Ainslie, 58, George Street, he was enabled to show to the meeting the original parchment Burgess and Guild Ticket of James Gardner, apothecary, dated October 5, 1786, and also the original parchment Burgess Ticket of his son, James Gardner, also designated apothecary, dated May 27, 1825. He also directed attention to some donations to the Museum, and a vote of thanks having been awarded to the donors, the meeting closed.

Proceedings of Societies in London.

CHEMISTS' ASSISTANTS' ASSOCIATION.

At the meeting of this Association on April 25, the following paper was communicated:—

ESSENTIAL OILS IN THEIR RELATION TO THE BRITISH PHARMACOPŒIA AND TRADE. BY JOHN C. UMNEY.

(Concluded from page 981.)

Nutmeg Oil.—The results of a comparison of foreign and English oils of nutmeg have recently been published in the *Ph. J.* [3], xxiv., 935, and a sample adulterated with a hydrocarbon oil reported on. The principal pharmaceutical use of this oil being for the production of sal volatile, it is highly important that the oil should be readily soluble in spirit. The English and pure foreign oils examined were found to be soluble in their own volume of alcohol of 94 per cent., and to show but slight variation in specific gravity, and the percentages boiling below 180° C., which were about 60 per cent. It seems desirable to call attention to one feature of the English oil there reported on which has also been observed in other unrectified samples, namely, the presence of a considerable proportion of fixed oil which doubtless passes over in distillation and is not removed by rectification. This concrete oil may be readily identified by separation and purification of the residue of fractional distillation of the oil, or by evaporation on a water bath; myristic acid, of which it principally consists, being recognised by the m.p. (64° C.). The presence of this body appears to cause, moreover, an unpleasant preponderance of the nutmeg over the lemon flavour in sal volatile, and hence should be carefully avoided. The optical rotations vary within narrow limits, the lowest being +16·25 in the case of an English oil, and the highest +23·25 in the case of a foreign oil, which was pure and answered all the required tests.

It is suggested that in the new pharmacopœia the words "distilled in Britain" be omitted and the following characters and tests be included:—

Specific gravity.—870–910 at 15° C.

Optical rotation from +15 to +25 in a tube of 100 Mm.

Soluble in an equal volume of a mixture of equal parts rectified spirit and absolute alcohol.

Absence of fixed oil.—The oil should not leave a crystalline residue when evaporated on a water bath.

Orange Oils.—The United States Pharmacopœia (1890) has made official, under the name of ol. aurantii corticis, the oils of both sweet (*Citrus aurantium*) and bitter orange (*Citrus vulgaris*). The British Pharmaceutical Conference formulary has also included for some years the oil of bitter orange for the preparation of elixir simplex. As it is by no means improbable that this preparation and others of the same type may be made official in the new British Pharmacopœia, it seems desirable to define as precisely as possible which variety of oil shall be employed, since the odours of the two oils when unmixed are sufficiently different as to make distinction possible between an elixir prepared with the oils of the sweet and bitter variety respectively.

The specific gravities of the oils show but slight variation from the statement of the United States Pharmacopœia, viz., about ·850 at 15° C. being from ·848 to ·856, but the optical rotation of a genuine oil of bitter orange, according to Schimmel and Co., may fall below +95°, the lowest limit fixed by the U.S.P. for the two oils, though this requirement is easily complied with as regards the sweet orange oil, which varies between 95° and 99° in 100 Mm. tube.

Should it be thought desirable to include one of the oils in the new British Pharmacopœia it would be preferable that it should be that of the bitter orange, which has been used during the past few years in this country in the pharmaceutical preparations already referred to.

A sample of pure oil, which has been examined, was found to have a specific gravity of ·8551 at 15° C., to have a rotation of +97·75° in a tube of 100 Mm.

Its comparison with a sample of adulterated oil, which had a specific gravity ·8568, a rotation of +74·0 is shown in the following table, but it is extremely difficult to frame characters and tests that will exclude for certainty the oil of the sweet variety.

Bitter Orange Oils.

Sample.	Sp. gr.	Optical rotation in tube of 100 Mm.	Purity.	Fractionation.			
				173–178° C.	175–178° C.	178–183° C.	Residue.
1.	·8568	+74·0	Adulterated. Free from lemon oil or turpentine.	P. c. 57	P. c. 24·7	P. c. 11·6	P. c. 6·7
2.	·8551	+97·75		20	61	14·0	5·0

The following are suggested as the most desirable requirements for ol. aurantii amar., obtained by expression from the fresh peel of *Citrus vulgaris*.

Specific gravity.—848 to ·856 at 15° C.

Rotation.—Not less than +92 in a tube of 100 Mm.

Peppermint Oil.—Although the "English distilled" oil of peppermint is the only kind recognised by the British Pharmacopœia for pharmaceutical purposes, yet several other varieties play an important part in the commerce of this article, and have in consequence definite and considerable value.

The English, German and American distillates are the produce of *Mentha piperita*, whilst the Japanese

Peppermint Oils.

Description.	Specific gravity at 15° C.	Optical rotation in tube of 100 Mm.	Total menthol percentage.	Below 210° C.	210°-220° C.	Above 220° C.
English.—Ewell (Surrey).	·9082	—31·5	70·95 p.c.	36·4 p.c.	59 p.c.	4·6 p.c.
" Market Deep- ing (Lincolnshire).	·9072	—28·5	63·1 "	28·0 "	66·4 "	5·6 "
German.—Miltitz (Sax- ony).	·9057	—26·25	61·42 "			
Japanese.—(1).....	·9062	—35·25	70·6 "	12·5 "	73·5 "	14·0 "
" (2) (partially dementholised).	·9012	—31·0	50·9 "	36·0 "	57·2 "	6·8 "
American Wayne County.						
—(1)	·9126	—21·5	48·1 "	32·0 "	42·6 "	25·4 "
—(2)	·9215	—29·0	46·4 "	22·8 "	58·0 "	19·2 "

oil is the product of *Mentha arvensis*, var. *piperasens*. The principal varieties of these oils may be classified thus:—

- English oils..... Mitcham.
 " Cambridgeshire.
German oils..... Saxon.
American oils..... Wayne County.
 " Michigan and Mississippi.
Japanese oil..... (1) Natural.
 (2) Dementholised (partially).

The investigation recently completed by Dr. Power has thrown considerable light on the constitution of and differences between these oils, fifteen definite chemical bodies having been proved to be present, inclusive of those previously known to exist, viz., menthol, menthone, etc., by Schimmel and Co. A quantitative method for the determination of menthol existing as both menthol and menthyl-esters has also been devised, which is found to work both easily and apparently accurately. The method consists in the conversion of the menthol present into menthyl-acetate by means of acetic anhydride and anhydrous sodium acetate, and after decomposition by standard alcoholic soda solution, determination of the amount of acetic acid which has entered into combination.

It will be convenient to consider first the Japanese oils, as the menthol-content is the sole factor for the estimation of its value.

The natural oil is not employed in pharmacy, but nevertheless it enters the Port of London in considerable quantity. The percentage of menthol it contains rules its market value. The actual percentage of free menthol varies up to 70 per cent., the amount of crystallisable menthol obtainable by the ordinary processes of separation falling, however, considerably below that amount.

The partially dementholised oil usually contains a not inconsiderable quantity of menthol, and has a lower specific gravity than the natural oil.

The following two samples, which have been examined during the past month, may be taken as types of these oils:—

Japanese Oil.	Sp. gr. at 15° C.	Total menthol percentage.	Optical rota- tion in tube of 100 Mm.
Natural	·9062	70·6 p.c.	—35·25
Dementholised (partially) ...	·9012	50·9 p.c.	—31·0

American Peppermint Oils.—These oils vary in price, which is gauged according to their aroma, freedom from contamination with the oils of other Labiatae, viz., spearmint, etc., being specially sought after.

The determination of the menthol percentage of

these oils is not of great value, although in some of the inferior Michigan oils it has been as low as 24 per cent., probably through partial dementholisation.

The following samples, selected from very many examined, indicate average commercial samples of the Wayne county oil, from which district large imports reach England annually, and last year particularly so, as the crop was unusually large.

	Sp. gr. at 15° C.	Total menthol percentage.	Optical rotation in tube of 100 Mm.
Wayne County (1).....	·9126	48·1	—21·5
" (2).....	·9215	46·4	—29·0

The English oils, the greater part of which are distilled in the districts of Mitcham, Surrey, in Cambridgeshire, Lincolnshire, and Hertfordshire, show only the slightest variations, and possess, when not rectified, a specific gravity of from ·900—·910 at 15° C.

The superior aroma of these oils, notwithstanding their power and pungency are directly due to the proportions of menthol they contain, appears to depend upon esters and aldehydes present in varying proportion in the oil, the actual menthol percentage one of secondary value. The proportion of free menthol present in these oils varies from 55 to 65 per cent.

It may be that the menthol present in the English oils is an isomeric modification of that found in Japanese and American oils, as experiment shows that the menthol crystallises far less readily from a sample of English than from these oils, although the percentages of free menthol indicated by the acetalisation and saponification process already mentioned be identical.*

The following figures represent two typical samples of English oil distilled in the districts mentioned, as well as one distilled from peppermint grown in Saxony.

	Sp. gr.	Total men- thol per- centage.	Optical rota- tion in tube of 100 Mm.
Ewell (Surrey) ...	·9082	70·95	—31·5
Market Deeping } (Lincolnshire) }	·9072	63·1	—28·5
Saxony ...	·9057	61·43	—26·25

The results of fractionation under the same conditions of all the above oils are included in the annexed table. The proportion boiling between 205–220° consisting largely of menthol, the boiling point of which is about 215° C.

* This observation is noted by Schimmel and Co. in their report (April, 1893) issued since this paper was written. They go further and suggest, however, that the superior aroma of English oil may be dependent on this modification of menthol, rather than to a variation in the relative proportions of the various esters present.

As it is doubtful whether the determination of menthol alone throws any direct light on the aroma value of the English oils, it is suggested that in the case of this oil (as well as that of lavender) the words "distilled in Britain" be retained in the new edition of the British Pharmacopœia, the characters and tests being amplified somewhat as under:—

Specific gravity at 15° C. 900–910.

Optical rotation.—25 to –32 in a tube of 100 Mm. Not less than 50 per cent. should distil between 210°–220° C.

Pimento Oil.—This oil is official in the United States Pharmacopœia, as well as the British Pharmacopœia of 1885, notwithstanding its close relationship to oil of cloves, which also finds a place in both those works. The oil is imported into this country from Jamaica in fairly large quantity, and notwithstanding the official requirement that it should be "distilled in Britain," is largely used for flavouring purposes. Examination of many samples of this imported oil have led to the belief that it is of excellent quality, and a recent comparison of a sample with a sample of English distillation is in favour of the foreign oil. The specific gravities of all the samples stand between 1.040 and 1.050 at 15° C., with the exception of one sample of German distillation, which possessed a specific gravity of only .9885, and differed so much in other respects as to make its character worth recording. The United States Pharmacopœia in requiring a specific gravity of from 1.045 to 1.055, places the lower limit somewhat too high, as the eugenol-content of several English oils of lower specific gravity is highly satisfactory, the characters of a typical one of which are detailed below.

The amount of eugenol present in this oil has been variously stated at from 33 per cent. (Oeser), to 70 per cent. (Stohmann). Estimations of this body by Thoms' benzoyl-chloride process, already mentioned (see oil of cloves), indicate 65 to 70 per cent. of eugenol, but even this proportion is lower than the specific gravity would appear to indicate.

The proportion of eugenol found by the alkali process does not agree so closely with the calculated amounts as in the case of oil of cloves, due apparently to the presence of resin and possibly small quantities of other bodies present in the oil.

The following are the percentages of eugenol determined by this process, together with those obtained by the benzoyl-chloride process.

Sp. gr.	Eugenol by benzoyl-chloride process.	Eugenol by caustic potash process.
English 1.042	67.9	81.5
Jamaica 1.049	69.28	82.5

The fractionation of the three oils referred to shows considerable difference between the German, English, and Jamaica samples, as the following indicates:—

	Below 247° C.	247–251° C.	Above 251° C.
English	36 p. c.	60 p. c.	4 p. c.
Jamaica.....	32 "	64 "	4 "
German.....	63 "	32 "	5 "

The optical rotations of all the samples examined vary from –1 to –3 in 100 Mm., with the exception of the light German oil already noticed, which had a rotation of –3.75. The following appear, therefore, to be the principal characters of pure oil, and might be thus incorporated in a new B.P. if its retention in that work be decided upon:—

Specific gravity.—Not below 1.040 at 15° C.

Optical rotation.—Not more than –4.

When treated with solution of caustic potash (as described under clove oil) not more than 25 per cent. should remain uncombined, equal to about 75 per cent. eugenol. Not more than 40 per cent. should distil below 247° C.

Pinus sylvestris Oil.—This oil, which is not official in either the United States or German pharmacopœias, is one employed in fair quantity, although principally for inhalation and external use in this country, and finds a place in our national Pharmacopœia, a minimum specific gravity of .870 at 15° C. being required.

This single character is one which is not easily complied with, the greatest diversity existing in the oils met with in trade, which appear to be the products of various species of *Pinus* and *Abies*, frequently, moreover, more or less mixed with oil of turpentine.

The characters of the oils distilled from the principal species of *Pinus* and *Abies* have been made the subject of a careful investigation in the laboratory of Schimmel and Co., the oil distilled by this firm from true *Pinus sylvestris* having a specific gravity of .866 at 15° C., and a rotation of +10.

I have been unsuccessful in obtaining an oil to answer these characters, the nearest approach to it being the oil sold under the registered title "fir-wool" oil. A sample of this recently examined had a specific gravity of .8682 at 15° C., and

Pin. Oils.

Described as	Sp. gr. at 15° C.	Optical rotation in tube of 100 Mm.	Percentage of Bornyl acetate.	Fractionation.					Remarks.
				Below 155° C.	155–165° C.	165–175° C.	175–200°.	Residue	
"Fir-wool" oil	.8682	+13.25	1.85 p.c.			76	16	8	
O. <i>Pin. sylvestris</i> (1) ...	.8372	–78.5	2.1 p.c.		7	69	20	11	Probably the oils of <i>Abies con-celsa</i> (young cones).
" (2) ...	.8570	–76.75	2.1 p.c.			74	18	8	
" (3) ...	.8645	–72.5	2.2 p.c.			74	16	10	
" (4) ...	.8633	–39.75	nil	4.4	52	30	7	6.6	Contains acetic ether and turpentine.
" (5) ...	.8758	–14.25	nil		81	6	13		Almost entirely turpentine.
O <i>Pin. pumilionis</i> (1)...	.8667	–7.75	5.6 p.c.		5	42	34	19	
" (2)...	.8682	–8.5	6.3 p.c.		4	40	38	18	

a rotation of +13.25 in a 100 Mm. tube. All the oils I have obtained from the Tyrol and Switzerland, where they are almost entirely distilled, are levo-rotatory and of much lower specific gravity. Their rotations vary between -60 and -70 in 100 Mm. tube, their specific gravities being from .866 to .865 at 15° C. These characters agree with those ascribed to the oil of the young cones of *Abies excelsa*, their probable identity being corroborated by their high percentage of limonene, as shown by fractionation. The odour of the fine oils is stated to be due to bornyl-acetate, the percentages present varying from 5 to 8 per cent. in the oil of *Pinus pumilio*, down to about 1 to 2 per cent. in the oils already described as being those usually met with in commerce. This ester may be readily estimated by the saponification process described under bergamot and lavender oils, and is a useful factor for the determination of the value of the oil apart from its physical characters. Fractionation indicates that the commercial oils contain large proportions of limonene, the "fir-wood" oil being no exception, although it differs from the others in containing a preponderance of dextro-limonene.

The pure oil distilled by Schimmel and Co. from true *Pinus sylvestris*, contained in addition to dextro-pinene and bornyl-acetate, a sesquiterpene in the highest fractions, which is absent in these other oils. Two grossly adulterated samples are included in the appended table, one consisting of turpentine with a small percentage of acetic ether, the other consisting almost exclusively of turpentine.

It is imperative, therefore, that if this oil be retained in a new B.P., its characters shall be so strictly defined as to necessitate an oil of constant composition being employed in pharmacy, of which the medicinal value, if any, may be determined. An investigation of the relative values of the oils of *Pinus pumilio* and *Pinus sylvestris* would be interesting and would probably result in the inclusion of the former oil only in a new British Pharmacopœia. The samples of *Pinus pumilio* that I have examined have been fairly constant in characters, two being included in a table appended. Special attention is called to the percentage of bornyl-acetate, viz., 5.6 and 6.3 respectively contained in them.

Rose Oil.—The variations in essential oils, due to differences in climate and soil (which have been already referred to in the case of lavender and peppermint), are perhaps more marked in the case of rose oil than in any other instance. The difference in the fusing point of oils distilled in different districts, as well as the proportions of stearopten contained in them, formed part of an interesting paper (*Ph. J.*, xviii., 504) by D. Hanbury in 1859. The fusing points recorded vary from 16° to 18° C. in the case of Turkish oils, to 30° to 32° C. in the case of English distilled oils (obtained, it should be noted, however, in the distillation of rose water). The percentage of stearopten obtained under precisely identical conditions varied from 6 and 7 per cent. in the case of Turkish oil, to 68 per cent. obtained from the English oil prepared under the conditions already referred to. Flückiger subsequently ('Y. B.,' 1885, p. 210) recorded 9.2 and 28.8 as the proportions of stearoptene in samples of Turkish and German oil respectively. The observation on the nature of the stearopten from rose oils by Schimmel and Co., who state that they have separated two hydrocarbons melting at 41° and 22° C. respectively, suggested to me that varying proportions of these two and possibly other homologous hydrocarbons might cause variation in the melting point of the oils, apart from the actual percentage of stearopten present.

The difference in the fusing points of the samples of German and Turkish oils was so great as to

make this matter worthy of experiment. 5 grammes of No. 2 (Turkish), No. 4 (German) were treated under precisely similar conditions with 35 C.c. of rectified spirit at 15° C. in successive portions, and yielded 43 and 59 per cent. of stearopten respectively. These stearoptens were carefully dried at 100° C., and were found to melt at the same temperature, viz., about 33° C. The strength of the odour of the oil is diminished in proportion to the stearopten present, and it is imperative therefore that in those districts where the conditions of climate and soil or manufacture cause such increase, that the oil should be freed from such objectionable feature.

I have tabulated the melting point of these samples, together with those of other well-known brands of Turkish oil of rose. It will be noted in that table that the specific gravities at 20° C. of the four samples of Turkish oil differ but slightly, whilst that of the German sample is lower and below that admitted by the United States Pharmacopœia, viz., from .865 to .880 at 20° C.

The specific gravity of geraniol is between .881 and .883 at 15° C., whilst the specific gravity of the stearoptene separated from the above oils was found to be between .875 to .880 at 15° C. It appears, therefore, that the specific gravity is not much influenced by the relative amounts of stearopten and alcohol (geraniol?) present.

The optical rotations of the oils examined were found to show slight variation; No. 1, which had the lowest melting point, having a rotation of -3.0. It may be noted that French, Algerian and Turkish geranium oils are levo-rotatory, samples of each kind examined giving the following results in a 100 Mm. tube:—

French geranium oil	-10.75
Algerian " "	-7.5
Turkish " "	-5.25

The chemistry of oil of rose must of necessity be considered undecided until the composition of the alcohol, which is its principal constituent, is determined. It is stated by Markownikoff and Reformatsky to be roseol ($C_{15}H_{26}O$), in opposition to Bertram and Gildemeister, who hold the view that it is geraniol ($C_{15}H_{24}O$), and is identical with that body as obtained from pelargonium and andropogon oils.

The latter view was adopted as the result of a chemical examination of Turkish and German rose oils, but Markownikoff and Reformatsky, whose experiments were made on samples submitted by the Bulgarian Government, now state that geraniol does not exist in pure Turkish otto of rose, the presence of it in the oil examined by the German chemists indicating geranium-adulterated oil. The fact that geraniol forms a stable compound with chloride of calcium, easily decomposed by water, renders the separation of that body comparatively easy, and the difference between the formulae ascribed to roseol and geraniol is so small as to make it difficult by combustion alone to decide which is the more appropriate. The physical characters will, therefore, need careful comparison to ascertain whether any difference exists.*

These doubts are quite sufficient to indicate that at present no conclusive chemical test for the presence of geranium oil in oil of roses can exist, and the result of a comparison by the United States Pharmacopœia test for that oil on three well-known brands of Turkish oil of rose, one of German distillation, and samples of commercial artificial ottos are included

* Certain slight differences are recorded and commented on in the half-yearly report of Schimmel and Co., just to hand (April, 1895), in the boiling points of geraniol and so-called roseol, as well as in the melting point of their acetates.

in the table. The test consists in adding five drops of concentrated sulphuric acid to five drops of the oil, and then shaking with 2 C.c. of alcohol, when the liquid should not at once assume a red or reddish-brown colour.

Rose Oils.

Description.	Sp. gr. at 20° C.	Optical rotation in tube of 100 Mm. at 25° C.	Melting point.	U.S.P. test for Geranium oils.
1 Turkish	·8684	-8·0	17° C.	Does not answer.
2 "	·8687	Inactive	20° C.	"
3 "	·8683	-0·25	19° C.	"
4 German oil of Rose ..	·8629	Inactive	29° C.	"
5 Artificial Otto	·8745	Inactive	Does not solidify at 6° C.	"
6 Artificial Otto	1·033	Inactive	14° C.	Answers test.
7 Artificial Otto	·8673	Inactive	23° C.	Does not answer.

In view of the desirability of fixing standards of purity for the oils most largely employed in pharmacy, though of no medicinal value, it is suggested that this oil be included in a new British Pharmacopœia, although tests for its purity and freedom from oils of geranium, etc., cannot be framed at present. The following two characters appear to be those of the purest oils of Turkish distillation met with in trade:—

Specific gravity at 20°.—·860 to ·870.

Melting point.—From 19 to 22° C.

Rosemary Oil.—The purity of oil of rosemary is a subject which has led to considerable controversy, and the passage of arms between Cripps and Schimmel and Co. will doubtless be fresh in the memory of those who follow closely the history of essential oils. The reason of that divergence of opinion appears to have arisen, in part, at any rate, through the fact that the former examined and commented on samples of English rosemary oils with one exception, whilst those reported on by the latter were either Italian or French or distilled by themselves from flowers and leaves from those countries.

The English oils examined by Cripps had a specific gravity of ·901 to ·924 at 15° C., whilst the genuine

French and Italian examined by Schimmel varied between ·901 and ·907 at 15° C. The oil distilled by Schimmel and Co. from dried French flowers, had a specific gravity of ·920 at 15° C., although they add, in reporting thereon, "if fresh material could be obtained for use, as would probably be the case with the oils of commerce, the specific gravity of the oil would come out somewhat lower. The specific gravity of the United States Pharmacopœia is 895 to 915 at 15° C., and the German Pharmacopœia ·89 to ·91.

The solubility of the oil in rectified spirit is a reliable test for the absence of turpentine, a pure oil dissolving in less than twice its volume of alcohol of that strength.

The pure oils examined were slightly dextro-rotatory, whilst the impure oils in which the adulterant was French oil of turpentine, were lævo-rotatory in proportion to the extent of their sophistication.

The percentage of borneol in this oil, which boils at 203 to 204° C., may be approximately determined by fractionation, but the saponification process, to which reference has been made under bergamot, admits of the exact estimation of the body, and affords indication of the purity or otherwise of the oil. The finest oils contain from 11 to 15 per cent., whilst the adulterated samples examined contained only from 7 to 8 per cent.*

The results of the comparison of an English (Lincolnshire) distilled sample with foreign oils of various degrees of purity appear in the following table.

During fractionation of the English sample the borneol crystallised in the condenser, but this was not observed either in the Spanish or any of the French oils.

The characters of pure rosemary oil appear, therefore, to be as under:—

Specific gravity.—·900 to 920 at 15° C.

* The examination of the Spanish oil showed the presence of 25·6 per cent. of borneol, whilst by fractionation important differences between it and pure rosemary oils were indicated. Its odour suggested "sage oil," and as a sample of Spanish oil of sage obtained from the same distiller examined was found to have a specific gravity of ·924 at 15° C., and to yield 29·12 per cent. of an alcohol, probably "salvial," by the saponification process, its admixture with that oil seems highly probable.

Rosemary Oil.

Sample.	Specific gravity at 15° C.	Rotation in a tube of 100 Mm.	Solubility in twice its volume of Rectified Spirit.	Borneol Per cent. e.	Fractionation.					Probable condition of Purity.
					Below 170° C.	176-186° C.	185-200° C.	200-215° C.	Over 215° C.	
English (Lincolnshire)	·9097	+7·5	sol.	13·26	P. c. 14	P. c. 46	P. c. 27	P. c. 8	P. c. 5	Pure.
Spanish	·9170	+9·75	sol.	25·6*	None	41	26	17	16	Probably mixed with "sage" oil.*
French 1	·8962	+·5	sol.	9·9	27	42	16	15	...	Doubtful.
" 2	·8814	-2·75	insol.	7·96	53	36	5	6	...	Adulterated (not less than 33 per cent. turpentine).
" 3	·8829	-2·5	insol.	7·9	52	34	8	6	...	Adulterated (not less than 33 per cent. turpentine).
" 4	·8975	+1·5	sol.	10·9	26	45	14	15	...	Doubtful.
" 5	·8861	-5·5	insol.	8·7	38	40	9	13	...	Adulterated (not less than 25 per cent. turpentine).
" 6	·9079	+3·5	sol.	11·07	22	42	16	20	...	Pure.

Should be soluble in twice its volume of rectified spirit.

Not more than 25 per cent. should boil below 170° C., and not less than 15 per cent. above 200° C.

Rue Oil.—Of all the essential oils official in the British Pharmacopœia, 1885, this one is perhaps in the least demand, and will doubtless be expunged from a new edition. This notwithstanding it has been thought desirable to make an examination of the oils met with in commerce, which showed marked variation in price, the oil of French distillation being quoted by many dealers at about quarter of the price at which pure German and Spanish oils were offered.

The genuine oils examined had a specific gravity of from .835 to .840 at 15° C., one which we have recently examined having a specific gravity of .8384 at 15° C. It solidified at about 4° C., and had a rotation of +0.4° in 100 Mm. tube. On fractionation the following percentages were obtained:—

Below 200° C.	3.4 per cent.
200-215	6.95 "
215-222	20.8 "
222-224	27.8 "
224-232	20.7 "
Above 240° C.	20.35 "

The whole oil, but more especially those fractions boiling between 215° and 232° C. respectively, gave a crystalline compound with bisulphite of sodium, due to methyl-nonyl-ketone, the presence of which in this oil was determined by Giesecke (*Zeitschrift für Chem.* 13, 1870, p. 428). That body is present to the extent of not less than 70 per cent. in this and the majority of pure oils.

The French oils have a specific gravity of about .870 to .880 at 15° C., one which we have employed for more extended examination having a specific gravity of .8762 at 15° C., and an optical rotation of -24.5 in a 100 Mm. tube. Both of these physical characters point to the gross adulteration of the oil with oil of turpentine, and this is confirmed by fractional distillation, the result of which was as under:—

155-160° C.	52 per cent.
160-165° C.	19.2 "
165-170° C.	8.4 "
170-190° C.	12.6 "
Above 190° C.	7.8 "

None of these fractions solidify on cooling to -0°-5 C., nor yield a crystalline compound with bisulphite of sodium.

From these figures it appears that a pure oil of rue should possess the following characters:—

Specific gravity.— -0.835 to -0.840 at 15° C.

Rotation.—Should be slightly dextro-rotatory.

Not more than 5 per cent. should boil below 200° C. The oil should solidify on cooling to a temperature of about 4° C., and should afford a crystalline compound with a saturated hot solution of bisulphite of sodium.

Santal Oil.—The B.P. of 1885 describes this oil as the product of *Santalum album*, stating that its specific gravity is usually about 0.96, and that it is readily soluble in alcohol.

E. M. Holmes (*Ph. J.*, xvi., 819), early in 1886, in describing the principal varieties of santal oil, called attention to the fact that the specific gravities of all of those oils which were the products of species of santal were higher than the pharmacopœial requirement, being from .971 to .979 at 15° C. in the case of oils distilled from Indian and Macassar woods (probably derived from one species), whilst an Indian distilled oil had a specific gravity of .9901 at 15° C. A sample of so-called West Indian oil, having a specific gravity of .9650, was also described, believed

to be the produce of one of the *Rutacæ* stated to have been imported from Venezuela. A sample of Fiji oil distilled in my firm's laboratory was subsequently reported on by McEwan (*Ph. J.*, xviii., 661), who found it to have a specific gravity of .9768 at 16° C., and a rotation of -25.5 in a tube of 100 Mm. The high specific gravity of a sample of Indian oil, viz., .9896, is also commented on, prolonged heating in the process of manufacture being the reason assigned for such peculiarity. The lowering of specific gravity by the addition of cedar wood oil is also referred to by Holmes (*ibid.*), and Cripps has also called attention to other features, viz., solubility in alcohol and colour reactions for the detection of cedar wood oil in santal oil.

In order to ascertain how far the oils met with in trade agree with these characters I have made a careful comparison of the chief commercial varieties both of English and foreign distillation. The specific gravities of the oils distilled from East Indian and Macassar wood vary between .975 to .980 at 15° C., and do not indicate the presence of cedar wood oil; the samples of this oil examined varying between .937 to .955 at 15° C. I have included in a comparative table appended the principal characters of a sample of this oil, which had a specific gravity of .9389 at 15° C.

I have also examined samples of Australian and West Indian santal oil, which possessed specific gravity of .9565 and .9623 respectively, and have included them in a comparative table. The optical rotation of the East Indian and Macassar oils, both of English and German distillation, varies between -17 and -20, whilst of the cedar oils examined, one was laevo rotatory to the extent of -38.25, though that appears to be somewhat abnormal. The West Indian and Australian varieties are both dextro-rotatory, this character being noted in the United States Pharmacopœia to preclude their use. The sample of West Indian had a rotation of +25.75, and the Australian +5.25 in a 100 Mm. tube. The fractionation of the oils is attended with some difficulty at ordinary atmospheric pressure, but the results obtained are interesting as showing the range of boiling of the various varieties of oils as compared also with that of a sample of cedar wood oil.

Santal Oils.

Distilled from.	Distilled in.	Sp. Gr. at 15° C.	Optical rotation in a tube of 100 Mm.	Solubility in 5 parts of alcohol of 70 per cent. (volume) at 20° C.	Distils principally between.
East Indian Wood	England	.9767	-17.75	Soluble	270-290° C.
East Indian Wood	England	.9784	-17.25	Soluble	270-296° C.
East Indian Wood	Germany	.9755	-18.75	Soluble	170-296° C.
Macassar Wood	Germany	.9762	-19.5	Not quite soluble	275-283° C.
Australian Wood	Germany	.9565	+5.25	Soluble	260-290° C.
West Indian Wood	Germany	.9623	+25.75	Insoluble	273-278° C.
Cedar Wood	Germany	.9389	-29.5	Insoluble	Below 260° C.

The solubility of the oil in alcohol of various strengths has been proposed as an additional test for the purity of this oil, Holmes having suggested soluble in equal volume alcohol, specific gravity .920, and Cripps stating that it should be soluble in 5 times volume alcohol (about 75 per cent. by volume) at 15°-5 C.

Schimmel and Co. suggest a solubility in 5 volumes alcohol, 70 per cent. at 20° C.

The U.S. Pharmacopœia, that one part of the oil shall form a clear solution with 10 volumes alcohol of 70 per cent. (volume) at 20° C.

Almost all the pure oils examined dissolve in 5 to 6 volumes of alcohol of 70 per cent. (volume) strength at 20° C., and it seems that that requirement is not too stringent.

The following may be summarised as the principal characters and tests of a pure East Indian (or Macassar) oil. (The quantity of West Indian, Australian, and other oils imported is so small as to be of little importance, although there is no reason for supposing that their therapeutic action differs to any great extent from that of the first-named.)

Specific gravity.—Not below .975 at 15° C.

Optical rotation.—Not less than -16, and not more than -20.

The greater portion distills between 275° C. and 295° C. One part of the oil should dissolve in 6 parts of alcohol of 70 per cent. by volume at 20° C.

Savin Oil.—This oil, which, like that of rue, is so little used as to warrant its exclusion from a future pharmacopœia, contains the sesquiterpene cadinene in common with oil of juniper berries, as well as pinene and other undetermined bodies to which the powerful action of the oil is probably due.

An oil distilled in Britain, which is alone official in the B.P., 1885, recently examined, had a special gravity of .9294 at 15° C.

The rotation of this oil was +43.5 in a tube of 100 Mm., which agrees fairly well with that obtained by Flückiger on a sample distilled from fresh plant cultivated at Mitcham.

It yielded on fractionation the following percentages:—

175-200° C.,	24 per cent.
200-220°	30 "
220-230°	17 "
230-240°	13 "
240-246°	5 "
Above 246°	11 "

A considerable quantity of a polyterpene, boiling at 228° C., was separated from this oil.

This oil is readily soluble in all proportions of alcohol of 90 per cent., and differs in this respect from juniper oil, which is only soluble in four times its volume.

The oil of savin largely imported from the South of France, and distilled in the neighbourhood of Nîmes, differs markedly from the above, the specific gravity, optical rotation, and percentages obtained on fractionation indicating the presence of turpentine to the extent of not less than 70 per cent., one part of the oil, moreover, requiring for solution six parts of alcohol of 90 per cent.

Specific gravity at 15° C., .8735.

Optical rotation. — 12.5.

Fractionation:—

155-160° C.	56 per cent.
160-170	25 "
170-210	8 "
Over 210	11 "

The characters of a genuine oil may be summarised as being:—Specific gravity .910 to .930 at 15° C.

Optical rotation.—+40 to +50 in a tube of 100 Mm. Not more than 25 per cent. should boil below 200° C.

Spearmint Oil.—Notwithstanding the requirement of the B.P., 1885, that the oil of *Mentha viridis* should be distilled in Britain, the amount produced is so infinitesimal and its cost so great, that it is but rarely used. Its employment for pharmaceutical purposes is, however, only local, very little being used in England, and it is doubtful whether any great

reason exists for its inclusion in a new British Pharmacopœia.

The oil principally employed in this country is that distilled in America, and the relative value of this oil and that of English (Mitcham) distillation is shown by a comparison which has been made between the latter and a sample distilled by a leading firm of American distillers.

The specific gravity of the English sample was .9245 at 15° C., the American being .9314 at 15° C., and falling within the limits of the U.S.P., which requires a specific gravity of from .930 and .940 at 15° C.

On fractionation the greater proportion passes over between 200° and 230° C., the principal fraction boiling between 222° and 226°, the range of the boiling point of carvol.

Both the oils answer the U.S.P. requirements, dissolving readily in alcohol of 90 per cent., and becoming turbid on further dilution.

OIL.	Specific gravity.	Carvol-percentage (approximate).	Optical rotation in tube of 100 Mm.
American ...	.9314	44 per cent.	-49.5
English (Mitcham)	.9245	38 per cent.	-35.5

The spearmint oil employed in Germany, but which is not imported, at any rate largely, into this country, is derived from *Mentha crispata*, and corresponds closely with that distilled from *M. viridis*. I have examined a sample of this oil, which possessed the following characters:—Specific gravity at 15° C., .9334; optical rotation in tube of 100 Mm.—49.75; approximate carvol percentage, 46 per cent.

If the oil be therefore retained in the new British Pharmacopœia, its source might be from either *Mentha viridis* or *M. crispata*, and the following characters and tests would then be suitable:—Specific gravity at 15° C., .920 to .940; optical rotation in a tube of 100 Mm.—35 to -50. Not less than 35 per cent. should boil between 222° and 226° C. One part should dissolve in 1 part of alcohol 90 per cent. strength, becoming turbid on further dilution.

Thyme Oils.—Under the misnomer of ol. origani pharmacists are in the habit of employing, principally for veterinary purposes, the oils of *Thymus vulgaris* and other species imported from the Continent, principally from the South of France. Although it is possible to obtain oils from this district that are the product of *Thymus vulgaris*, the majority of the commercial oils are the products of that species more or less contaminated with *Thymus serpyllum*, as is shown by examination of their principal characters. The two varieties of the oil known commercially are "red" and "white," the colour of the former being due to the reaction between the phenols present with iron, with which, during distillation, the oil comes in contact. I learn from Mons. A. Merle (of Messrs. Bruno Court-distillers of essential oils, Grasse) that the intensity of the colour of the red oil is increased by the imperfect cooling of the condensers used in distillation. This is readily understood when it is explained that the herb is distilled on the mountain sides in rough stills in convenient proximity to the growing herb, where it is often difficult to obtain water for the purpose of condensation. The red colour is entirely removed by redistillation, producing the white or yellowish oils already referred to.

The chief constituents of the oil are thymol and carvacrol, the boiling points of which are about 225° C. and 232° C. respectively. It is therefore by fractionation possible to ascertain approximately the proportion of these bodies present, although the actual percentage may be determined by treatment of the oil with caustic alkali.

The specific gravity of the samples examined varies considerably, being from .890-.920 at 15° C., those having a specific gravity less than .905 being of poor quality and yielding only small percentages boiling above 220°. Typical commercial oils, both of the "white" and "red" varieties, are included in the appended table, one of the latter variety being greatly adulterated.

The pure oils are only slightly *laevo*-rotatory, whilst the poor grades of oils show greater rotation, according to their admixture with the oil of *Thymus serpyllum*, which is more strongly *laevo*-rotatory, the turpentine-adulterated oils reaching -20.

Thyme Oils.

OIL.	Distilled in.	Specific gravity at 15° C.	Optical rotation in tube of 100 Mm.	Boiling above 220° C.	Remarks.
White	Germany ..	.8944	-8.5	7 per cent.	Poor.
Red	France ..	.9019	-12.0	15 "	Poor.
	France ..	.8854	-7.25	None "	Adulterated.
White	Germany ..	.9026	-0.75	88 per cent.	Fine.

Pure oil should answer the following requirements:—

Specific gravity.—Not below .905 at 15° C.

Rotation.—Not more than -6.

At least 25 per cent. should boil above 220° C.

Winter-green Oil.—It has been thought fitting to mention this oil, notwithstanding that it is not yet official in the British Pharmacopœia, as it is being largely and increasingly used in this country.

The United States Pharmacopœia, 1890, includes the following:—

Oleum betulae albae (oil of sweet birch).

" *gaultheriae* (oil of winter-green).

Methyl salicylas (artificial or synthetic oil of winter-green).

The oils of sweet birch and winter-green consist almost entirely of methyl-salicylate, the first-named, on account of the far lower cost of the material from which it is distilled, constituting at the present time the natural oil of trade. Objection has been raised by Behringer to the introduction into the U.S.P. of synthetically prepared methyl-salicylate, on the ground of its possible contamination with other esters. This may be avoided by the careful purification of the salicylic acid used in its production, and the absence of such impurities may be proved by checking the melting point of the salicylic acid liberated from the compound.

The specific gravity of the "natural" oils examined varied from 1.180 to 1.185. They were without exception optically inactive, confirming their production from *Betula alba* (the oil of gaultheria being slightly *laevo*-rotatory), and dissolved in an equal volume of 90 per cent. The whole of the oils distilled between 217° and 222° C. The specific gravity of a German sample of "artificial" oil examined was 1.885 at 15° C; it was found also to be optically inactive, to dissolve in an equal volume of alcohol of 90 per cent., and to distil entirely between 218° and 221° C.

The salicylic acids obtained from these samples of both natural and synthetic oils, by saponification and liberation with hydrochloric acid, was found after one recrystallisation to melt at exactly the same point,

156.75° C., indicating their identity and freedom in the case of the synthetic oil from para- and other cresotic methyl esters.

If, therefore, it is thought fitting to include in a new B.P. one of these oils, there seems no valid objection to the introduction of the "synthetic" oil, provided that compliance with the above-detailed characters be required.

Provincial Transactions.

BRISTOL PHARMACEUTICAL ASSOCIATION.

On May 10, a meeting of the Council of the above Association was held, Mr. Allen, President, in the chair. After the routine business, the Hon. Sec., Mr. Keen, reported the result of the class on the pharmacy of the organic portion of the Pharmacopœia which he had held during the winter months.

The class consisted of thirteen students—apprentices, and assistants of pharmacists—who met weekly during twenty weeks. From the attendance book it was seen that the attendance was highly satisfactory, and it was clear the young men were well interested in the subject. The whole of the organic materia medica of the Pharmacopœia was discussed and the specimens duly examined and explained.

A resolution moved by the President, and seconded by Mr. Schacht, was carried—thanking Mr. Keen for his able and patriotic services—and the hope was expressed that corresponding efforts might be made during the coming season so as to include the study of the inorganic preparations of the Pharmacopœia, as well as those derived from organic sources.

Reviews and Notices of Books.

ST. BARTHOLOMEW'S HOSPITAL REPORTS FOR 1894, edited by SAMUEL WEST, M.D., and W. J. WALSHAM, F.R.C.S. Vol. xxx. Pp. 332, with 7 illustrations and appendix. Price 8s. 6d. (Smith, Elder and Co., London, 1895.)

As usual this volume like its predecessors is full of important information concerning the transactions of the great City hospital during the year 1894. Among the many valuable papers it contains, the following are particularly worthy of attentive study: "Notes on Chloroform Anæsthesia," by Richard Gill; "The Dietetic Values of Food-stuffs Prepared by Plants," this is a lecture delivered before the Abernethian Society, by Rev. George Henslow; "Notes on Hydroxylamine Hydrochlorate as a Substitute for Nitrite of Amyl or Nitro-glycerin," by Dr. Lauder Brunton. There are three papers on diphtheria. Dr. Macan discusses the history of diphtheritic paralysis. Dr. J. A. Hayward deals with the diagnosis of diphtheria, and Dr. James Adams considers the question of the immunity of puerperal women from its infection. Mr. Horder's paper, "On the Life and Work of Percivall Pott," is sure to be earnestly read by

St. Bartholomew's men; it is a particularly interesting and able literary effort. There are several papers of purely surgical interest on important subjects, and the last third of the volume is occupied by the usual official reports of the Curator, and the Medical and Surgical Registrars. A mere glance at these tables shows what an enormous amount of medical and surgical work is accomplished within the walls of this great institution.

HANDBOOK OF PHARMACY, BY VIRGIL COBLENTZ, Ph.G., A.M., Phil. D. Pp. 480, with 395 illustrations. Price \$4.00. (P. Blakiston, Son and Co., 1012, Walnut Street, Philadelphia, 1894.)

In this treatise on pharmacy, the author professes to supply to the student of pharmacy a compendious yet sufficiently detailed text-book for systematic study, and to those exercising the art, a trustworthy guide to be consulted in daily practice. In accordance with this plan, particular care has been bestowed upon the explanation of all operations and methods usually occurring in dispensing establishments and laboratories designed on a small scale. The work, therefore, appears to be intended particularly for the student of pharmacy and for the retail pharmacist. Bearing in mind the keenness of competition, it must appear exceedingly desirable that both should be intimately acquainted with improvements in every department of pharmacy—the former that he may be spared the loss of time in studying the theory and learning the practice of methods that are already antiquated; the latter that he may acquire an advantage over his competitors in producing by new methods preparations that by their superiority commend themselves to his clients, both medical and non-medical.

American pharmaceutical educational establishments and American pharmaceutical literature convey the impression that in the United States special attention is paid to the practice as distinguished from the theory of pharmacy. Certainly from America have proceeded most of the recent compendious works on pharmacy. The student of 'Coblentz's Handbook' may reasonably expect therefore that from a practical point of view the work will be of especial value: in this he will not be disappointed. The matter is divided into four parts, theoretical pharmacy, galenical pharmacy, the art of dispensing and volumetric analysis, an arrangement which will commend itself to most pharmacists.

In Part I. the various weights and measures, the determination of specific gravity and the numerous operations practised in pharmacy, distillation, etc., are discussed. The compilation has been very completely made, and every pharmacist who takes an intelligent interest in his work will derive advantage and pleasure from the descriptions of the numerous balances, stills, percolators, and presses, most of which are accompanied by good illustrations. In the otherwise excellent chapter on specific gravity, the description of the operation of taking the specific gravity of a solid is followed by the statement that the "specific gravity is then found by the rule (1) :—

Divide the weight of the body in air by its loss of weight in water, the quotient will be the specific gravity." Surely a few words of explanation would be of great service in rendering the reasons of the steps taken intelligible to the student, and remove the impression that a rule to be learnt is being substituted for a principle to be understood, an impression confirmed by the frequent occurrence throughout the chapter of the words "then apply the rule."

In Part II., treating of galenical pharmacy, a general discussion of each class of preparations precedes the discussion of each particular member of the class. To such as are official in the U.S. Pharmacopœia, methods of assay are as far as possible appended. The chapter on percolation, though short, is to the point, and includes the combined processes of percolation and expression, and of maceration and expression. Capsules and capsule-fillers are discussed at some length, as are also tablet and suppository machines, the most recent of the latter being described and figured; these machines appear to be superseding the old-fashioned melting-method, although English pharmacists are by no means familiar with them. The 'Art of Dispensing' is dismissed in thirty-six pages, and calls for as little remark as the chapter on Volumetric Analysis. The paper and printing are excellent, and the work (which is not overloaded with too much ballast direct from the Pharmacopœia) commends itself to both pharmacist and student as a volume of great utility.

THE ELEMENTS OF HEALTH: An Introduction to the Study of Hygiene. By LOUIS C. PARKES, M.D., D.P.H., Lond. Pp. 246, with 27 illustrations. Price 3s. 6d. (J. and A. Churchill, London, 1895.)

Dr. Parkes' work is intended as an introduction to the study of hygiene, his main idea being "to give some simple yet practical information and instruction on the preservation of individual or personal health in the ordinary routine of domestic life." Accordingly, the first chapter is devoted to domestic water supplies, house cisterns, filters, and the purification of this prime essential of life. Next, under the heading of domestic refuse, the question of drainage is considered. Following this, ventilation, warming, lighting, and house construction in its sanitary aspect, receive attention. Chapter VIII., on Foods, is the longest in the book, as its importance deserves. The classification and composition of foods are briefly given, animal and vegetable diets are contrasted, digestibility, cooking, variety and admixture, etc., of foods receive attention, and then a mass of useful information on special points is condensed into some thirty pages. The concluding chapters treat of physical exercise, clothing, and the care of the skin, teeth, and bowels. The book is a thoroughly practical one, well written and free from fads, and seems to fulfil the author's ideal of embodying in a small compass "just that amount of practical knowledge of Hygiene which it is desirable that every individual should be in possession of."

Correspondence.

[*Letters should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.*]

EXPERIMENTAL CLOUD FORMATION.

Sir,—Mr. Shaw's experiment, shown at the Royal Society's Soirée, can be easily repeated by anyone having at hand an ordinary glass retort of, say, one quart capacity, and filling this with water, then turning it on its back and allowing it to empty itself by gurgitation. It will be observed that when the pressure in the vacant part of the bulb is reduced, a mist is produced which lasts for a moment only, until the normal pressure is restored by admission of air. This phenomenon I have often observed, but I don't think it is generally known.

Poole.

THO. B. GROVES.

THE PRELIMINARY EXAMINATION.

Sir,—The publication of the report of the Council affords an appropriate opportunity to rediscuss the venerable subject of the Preliminary examination. My apology for again referring to the matter is the impression on my mind that need for reform has not been sufficiently urged upon the Council, and I am sure that it is not generally realised how urgent that need is. After mature reflection, I believe it to be by far the most important and pressing matter before us, and one which would work a more beneficent revolution in English Pharmacy than any measure yet adopted.

When the educational history of these times comes to be written, the historian will be furnished by the Council of the Pharmaceutical Society with a beautiful instance of what may be called "Inverse educational architecture." Year by year it has raised its technical examinations, widening their scope and raising their character, yet the foundation of the structure, on the solidity of which the soundness of the whole fabric depends, has been left precisely as it has always been. What can be more absurd, for example, than to attempt to teach exact sciences like modern chemistry and physics to students who have never been taught geometry and algebra, and who are characterised by 50 per cent. of failures in very elementary arithmetic? My own experience (not a small one) of pharmaceutical students is that by far the most important cause of failure at the examination is not want of proper technical training, but lack of primary education; the men's minds have never been sufficiently developed to properly grasp the ideas presented to them. Many of them, indeed, are unable to understand the ordinary language of the text-books. And amongst the more intelligent it is depressing, to say the least of it, to see men engaged in research work wasting hours over laborious arithmetic to ascertain something which the application of a simple algebraical formula, intelligible to most modern school boys, would solve in a few minutes. It is futile to urge that amongst the senior students a few possess real educational attainments. They are abnormal specimens, and nine-tenths of them treat pharmacy merely as a stepping-stone to some other calling. But there is another side of the question which should appeal more directly to the bulk of pharmacists. Reform of the Preliminary examination would exclude a great many individuals who become the worst enemies of the calling they enter. It is not, as a rule, the educated man who lends himself to companies to evade the Poisons Act, nor is it the educated man who insists that grocers and chemists are to be placed in exactly the same category and acts accordingly. Apart from all this, does any reasonable

man think that the Preliminary examination represents that amount of education which, in these days, may be reasonably expected in a first-class tradesman or mechanic and I suppose a pharmacist is the equal of these at least?

It has been stated that the inertia of the Council is due to opposition from parts of England where it is the custom to draw pupils or apprentices from the ranks of errand boys. I cannot think that the Council of the Pharmaceutical Society of Great Britain can attach real importance to opposition based on such a fact. That Council is not merely a representative of its constituents, it is also the guardian of the best interests of English pharmacy, and I do not believe that it will let the fancied interests of a few errand boys and others, who will not take the trouble to properly educate themselves, stand in the way of an important and necessary reform. The power to act has been for years in the hands of the Council; I feel sure that a majority advocate reform, and the reason for the delay seems to me inexplicable.

The reform I have always advocated is to adopt the same list of preliminary examinations as that accepted by the Medical Council for registration as a medical student. If this be thought too severe I would propose the incorporation of algebra (up to and including quadratics), euclid (book 1), elementary mechanics, and a modern language, with the present examination. The foolish essay writing, which is indicative neither of reasoning power nor knowledge, might be excluded. Finally, I would call upon all those who are interested in the matter to urge upon the Council of the Society the immediate necessity of reforming an absurd and injurious anomaly.

128, Victoria Street, S.W.

A. CAMPBELL STARK.

THE COUNCIL ELECTION.

Sir,—I differ from your correspondent, Mr. Bradley, and would certainly not advise electors to vote for candidates who live nearest to the "Square" merely on the assumption that those who live further away are remiss in their attendances. Two new members are bound to be placed on the Council at this election, and I hope the best two will be chosen; but, repeating my warning of last year, I do hope that voters will not allow such of the old councillors as have done yeoman service for us in the past to be left out in the cold in their anxiety to put new men in. Let us first stick to all that is worth keeping, and for the rest let us think twice before acting once amiss, and if I might presume to advise I would say vote rather for those who are in the trade, getting their daily bread by it, even though they may have occasionally to leave their business and make a journey of 200 miles or more to attend Council meetings.

Manchester.

HARRY KEMP.

Sir,—In your issue of May 11, I notice a correspondent advises members to vote for those gentlemen residing in or near to town. Why? Does it necessarily follow that those gentlemen are best suited to the work? Granting that very little interest is taken in the elections, would this tend to increase it? Again, your correspondent advises voters to erase the names of those who have attended fewest meetings. Can we do this when we are not aware of the circumstances which may have prevented attendance? Again I ask, does it necessarily follow that those who attend most meetings work hardest? Is it not possible that unscrupulous men might attend meetings simply for the chance of getting to London every month free of expense? I am glad names are suppressed, to publish them would at least, I think, be a mistake.

NEMO.

Notes and News.

ANNUAL DINNER OF BRITISH PHARMACISTS.—The members of the Pharmaceutical Society and their friends will assemble at the Whitehall Rooms, Hôtel Métropole, on the occasion of the Annual Dinner, on Tuesday next, May 21, at 6.45 p.m., and the President, Mr. Michael Carteighe, will take the chair at 7 precisely. Those who have not already obtained tickets (one guinea each), should apply at once to Mr. Richard Brembridge, 17, Bloomsbury Square, London, W.C.

ANNUAL MEETING AND ELECTION OF COUNCIL.—The fifty-fourth annual meeting of the Pharmaceutical Society will be held at 17, Bloomsbury Square, W.C., on Wednesday next, May 22, when the chair will be taken by the President, Mr. Michael Carteighe, at 12 o'clock noon precisely. The business will be to receive the Report of the Council and to elect the Council and Auditors for the ensuing year. Members and Associates in Business of the Society are reminded that their voting papers must be in the Secretary's hands on Monday at latest, otherwise the votes will not count unless the papers are handed in at the meeting by the voters personally.

CHEMISTS' ASSISTANTS' ASSOCIATION.—The officers of this Association for the next twelve months are as follows:—President, Mr. E. W. Hill; Vice-Presidents, Messrs. C. Morley and G. Roe; Treasurer, Mr. C. J. Strother; Literary Secretary, Mr. R. G. Guyer; Financial Secretary, Mr. R. Melhuish.

FAILURES AT PHARMACEUTICAL EXAMINATIONS.—The *New England Druggist* confirms the accuracy of the statistics recently quoted (*ante*, p. 881) from a Boston newspaper, with regard to the proportion of failures (88.4 per cent.) in the examination for registration as pharmacists in Massachusetts.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The next meeting of this Association is to be held at Denver, Colorado, commencing August 14. Papers on commercial and allied subjects, and other communications, should be addressed to Mr. George J. Seabury, Chairman of the Commercial Section, 59-61, Minden Lane, New York, U.S.A.

RE-REGISTRATION OF PHARMACISTS IN NEW YORK.—The Legislature of New York State has referred two Bills providing for the annual re-registration of pharmacists to committees, but they are not expected to prosper.

PHARMACEUTICAL ETHICS IN AUSTRIA.—As illustrating the strictness with which the dealings of the Austrian pharmacist are supervised by the authorities, the Vienna correspondent of the *Medical Press* narrates that, in a large provincial town, a local chemist has been punished by the Minister of the Interior for compounding the prescription of an innocent nature which was written and sent to him by a popular charlatan.

THE EARLY CLOSING BILL.—The chemists and druggists of Dundee and Loches have unanimously petitioned Parliament in favour of Sir John Lubbock's Early Closing Bill, believing that it will confer a great boon on a large section of the community.

CEYLON BOTANIC GARDENS.—Dr. Trimen, F.R.S., in his report for 1894, states that the export of tea has remained stationary for the year (84,591,714 lb., as against 84,406,064 lb. in 1893); coffee continues to be neglected (32,205 cwt. exported); whilst of cacao, which fluctuates continually, 21,110 cwt. was sent away in 1894. The cultivation of trees yielding *Sarai* indiarubber is again referred to, one tree experimented on having yielded as much as 3 lb. 3 oz. of dry rubber during last year. Amongst other economic plants briefly alluded to are those yielding gutta-percha, gambir, camphor, and cubebs.

'SCIENCE PROGRESS.'—In the May number of this periodical, Professor Oliver J. Lodge rehearses a summary of most of the more prominent and interesting facts bearing on the connection between light and electrification. He proposes to collate these facts, and consider their bearing in a future article. Dr. A. D. Waller deals with two fundamental "laws" of nerve-action in relation to the modern nerve-cell—the law of trophic action and the law of forward direction; Dr. G. A. Buckmaster prefaces an instructive article on the antitoxins of diphtheria by commenting on the nature and value of the connection between the biological sciences and applied medicine; and other articles are on "Methods of Petrographical Research," by Alfred Harker; "Progress in Physical Chemistry during 1894," by J. W. Rodger; "Notes on the Reproductive Organs of Olive-brown Seaweeds," by George Murray; and "Budding in Tunicata," by W. Garstang.

PHARMACY IN VICTORIA.—The report of the Pharmacy Board of Victoria for 1894 shows that 126 candidates presented themselves for the Preliminary Examination during the year; forty for Chemistry and Practical Chemistry; thirty-eight for *Materia Medica* and Botany; thirty for the Final Qualifying Examination, and one for the Modified. They included students from New South Wales, New Zealand, Queensland, and Tasmania. Sixty candidates passed the Preliminary, twenty-two the Final, and one the Modified Examination. The number of Pharmaceutical Chemists registered under the Pharmacy Act, 1876, was thirty-four, bringing up the total number to 814, whilst forty-nine apprentices were registered, and 126 certificates granted to dealers in poisons distant four miles from a registered pharmaceutical chemist.

PLYMOUTH, DEVONPORT, STONEHOUSE AND DISTRICT CHEMISTS' ASSOCIATION.—An elementary examination in practical chemistry will be held at the Technical Schools, Plymouth, on Tuesday, the 28th inst., at 7 p.m. Unqualified members of the Junior Section only are eligible. All those wishing to compete must communicate with the hon. sec., Mr. James Cocks, Edgcombe Street, Stonehouse, by the 23rd inst.

Parliamentary News.

IMPORTED MILK.

In the House of Commons on Thursday, May 9, Mr. Lambert asked the President of the Local Government Board if he had any evidence to show whether milk obtained from cows suffering from foot-and-mouth disease was injurious to health; and whether large quantities of milk were imported from Holland, which was scheduled under The Contagious Diseases (Animals) Act, 1878, as containing cattle infected with foot-and-mouth disease; if so, would he take proper precautions to prevent such milk from being utilised for human consumption in this country.

Mr. Shaw Lefevre replied that there was no evidence that disease had been spread in this country by imported milk. With insignificant exceptions imported milk was in a condensed form, and the processes of heat to which it was subjected, he was advised, destroyed its powers to convey infection, whether of foot-and-mouth disease or tuberculosis. The Local Government Board had no power to prohibit the importation of foreign milk.

UNIVERSITY OF LONDON.

In the House of Lords on Thursday, May 9, Lord Playfair, in introducing a Bill for the reconstitution of the University of London, said that a Royal Commission was appointed two years ago by the late Government for the purpose of considering whether London University should be merged in a teaching university, or whether a new university should be formed for London. The Royal Commission, concurring in the decision of a former Royal Commission on the same subject, thought that the London University, from its reputation and convenience of examination, should be retained rather than that a new university should be established. Accordingly they issued a scheme which was very favourably received by all the interests concerned and adopted by the Senate and Convocation of London University, and resolutions in its favour were passed by all the colleges and bodies interested. The Royal Commission pointed out that it would be exceedingly difficult to carry out the scheme by charter, and recommended it should be carried out by Act of Parliament—by statutory commission. The object of the Bill was to carry out the views of the Royal Commission. Of course, an elaborate scheme such as that would be explained on the second reading, when the Government would be prepared to name the statutory commissioners. There was no intention in the Bill to interfere with the Imperial character of the university, which at present examined students external to London, and this particular characteristic of the university was specially preserved. The Bill was a very simple one and only contained three clauses, and it would be better for him to reserve an explanation until a further day. He now moved the first reading. The measure was read a first time.

Wood is found by Mack to possess the power of doubly refracting electric waves, just as tourmalin similarly affects light waves. Two concave Hertz mirrors, with their focal lines crossed, do not allow electric waves to pass, but the introduction of a plate of wood with the fibres at an angle of 45° to each of the focal lines is said to enable the waves to pass, much the same as the introduction of a sheet of doubly-refracting substance between crossed Nicol prisms allows light rays to pass.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

POISONING OF CATTLE BY NITRATE OF SODA.

At the time of year when nitrate of soda is being used as top dressing, a word of warning as to its effects upon live stock may not be out of place. Two years ago a number of cattle died rather suddenly on a farm in South Lincolnshire, and an inquiry into the circumstances of the case left no room for doubt that death arose from the eating of nitrate of soda which the animals obtained from bags which had been used in conveying this fertiliser into the field, and had afterwards been left lying about. More recently a case has occurred on a farm in Massachusetts, in which eleven cows out of a herd of fifteen died as a result of having had given to them nitrate of soda in mistake for common salt (sodium chloride). The fifteen cows had been out a grass all day, and were driven to the stalls in the evening, when an attendant gave to all except two what he supposed to be common salt, thoroughly mixed with a small quantity of wheat bran. Apparently, all the animals ate heartily. Two hours later the cows attracted notice by the noise they were making, and when examined they were found to be uneasy and evidently in pain, and several died within an hour or two. The only skilled advice obtainable was that of a medical practitioner, who, thinking the case was one of arsenic poisoning, prescribed accordingly, but before morning eleven of the cows were dead. An examination of samples of material collected from the mangers, from a pail containing a mixture of bran and salt that had been taken from the mangers, and from various other places, revealed the presence of large quantities of nitrate of soda, but no common salt. An analysis of the contents of the stomach failed to reveal any trace of arsenic, lead, or other mineral poison.

Nearly twenty years ago somewhat similar cases were recorded in the *Archives Vétérinaires*. A horse had drunk freely of a solution of nitrate of soda, and exhibited many of the symptoms that were subsequently noticed in the Massachusetts cattle; the administration of strong infusions of coffee and alcohol and irritant clysters relieved the animal, which in a few days completely recovered. In another case four bags of nitrate of soda had been placed at equal distances on a grass field and allowed to remain some five hours before being applied. Meanwhile, some of the nitrate had become washed from the bags upon the ground by a fall of rain. Three days later cows were turned into the pasture and obtained the salt by licking it from the herbage in the vicinity of which the bags had stood. They showed symptoms of poisoning, but ultimately recovered. One other case worth noticing is that in which two hundred bags which had contained nitrate of soda were washed in large tubs of water close to which the cattle passed on their way to the pasture. A few hours afterwards many of the cows were seen to be ill, and within eight hours two of them had died. These turned out to be the first two that had left the stalls, and consequently had time to drink more of the solution than the others. These cases all serve to show that care should be exercised upon stock farms in the handling of nitrate of soda, and there is no better period of the year than the present for enforcing the lesson.—*Times*.

BRISTOL NATURALISTS' SOCIETY.—At a meeting of this Society, held on Thursday, May 2, at University College, Bristol, Dr. Young gave the presidential address on the "Liquefaction of Gases." Very little, he said, was known by chemists about gases till the investigations of Priestley about 120 years ago, but he made no attempt to liquefy them. In 1806 the first success was obtained with chlorine. The great pioneer, however, in this direction was Faraday, who not only succeeded in liquefying many gases (among them ammonia, hydrochloric acid, sulphur dioxide, and carbonic acid), but even where he could not succeed pointed out the lines on which success was to be finally achieved. The gas must be subjected either to compression, cooling, or a combination of these two agencies. Dr. Young showed Faraday's method of obtaining liquid ammonia by warming some chloride of silver, to which ammonia had been attached, in one end of a sealed tube, dipping the other end into a freezing mixture, where the ammonia given off is condensed into a liquid. Another very pretty experiment was the condensation of the red fumes of nitrogen trioxide into a dark blue liquid. Oxygen, nitrogen, hydrogen, carbon monoxide, and marsh gas resisted all efforts for a long time, and were called "permanent gases." Dr. Andrews was the first to show, by some remarkable and exact experiments with carbonic acid, that above a certain temperature, which he called "critical temperature," no amount of compression produces liquefaction. In the case of carbonic acid this temperature is 31° , but in that of some of the so-called permanent gases the critical temperature is so low (in the case of hydrogen, for instance -233°) that experimenters have failed from having applied compression at too high temperatures, thus foredooming their results. Some twenty years ago two foreign observers—Pictet and Cailletet—succeeded in liquefying oxygen and nitrogen (whose critical temperatures are -119° and -146° respectively), but it was only early this year that Messrs. Wroblewski and Olazewski succeeded in reducing hydrogen to a liquid state. The principle of the method employed in the case of these refractory gases is to pass the gas under pressure into a tube which is immersed in a liquid whose boiling point is naturally very low, and is still further and artificially lowered by being subjected to a much reduced pressure. Thus ethylene under reduced pressure can be made to boil at -150° ; oxygen liquefied by this means can again, under reduced pressure, be made to boil at a much lower temperature still, and in this way probably hydrogen has been liquefied. The lecture was freely illustrated by experiments and diagrams.

UNIVERSITY OF LONDON.—The *Daily Telegraph* remarks that for all practical purposes Convocation of the University of London has decided to separate itself from the scheme to found a real university in the metropolis. Mr. Bompas, Q.C., moved to rescind the resolution passed in January, "That there should be one university, and not two," and to declare "that if a local teaching body for London be desirable it ought to be constituted apart from the existing University of London." This was seconded by Dr. Hart, and supported by several speakers, including some country representatives; while, on the other side, Dr. Fitch, Mr. Cozens-Hardy, Principal Cave, and others strongly urged the necessity of one great teaching institution, "to promote scholarship and research," and to make the greatest capital in the world, as Dr. Fitch observed, also "a great seat of learning." On a division, the motion was rejected by 238 votes to 117. This was the decision of London

on the subject. It represented the desire of all the colleges, medical schools, and the whole teaching profession of the metropolis, and it affirmed the principle of what is known as the Gresham scheme, now before Parliament, which is the outcome of much discussion and inquiry by two Royal Commissions. But another vote had to be taken to elect to the Senate a Fellow in place of the late Sir William Savory. Not ostensibly, but really, this election was a test of the opinion of Convocation on the Gresham scheme. Dr. Bateman Napier was the nominee of the committee opposed to it, and Mr. Cozens-Hardy represented those in favour. In this contest country members sent up their voting papers, and the final result was—Dr. Napier, 1231; Mr. Cozens-Hardy, 733. In other words, London will certainly have a teaching university, and that ere long; but, in order to preserve the privileges of non-collegiate provincial students, the country members of the existing University of London decide by a majority of nearly 500 that it shall remain as it is, merely an examining board.

THE BEE PRODUCTS OF EUROPE.—The yearly production of beeswax and honey attains very considerable dimensions in the counties of Continental Europe. According to the latest details available, the annual output of wax is about 15,000 tons, with a value approaching £1,350,000. Of honey the annual production is estimated at 80,000 tons, and its value at £2,200,000. The following are the figures for the most important countries, the small balance of 5300 tons belonging to other countries which are not named below:—

Country.	Stock of Bees.	Annual Production of Honey.	
		No.	Tons.
Germany	1,910,000		20,000
Spain	1,690,000		19,000
Austria	1,550,000		18,000
France	950,000		10,000
Holland	240,000		2,500
Belgium	200,000		2,000
Greece	130,000		1,400
Russia	110,000		900
Denmark	90,000		900

In the United States of America there are about 2,800,000 stocks of bees, producing annually some 30,000 tons of honey. No statistics relating to this industry are collected in Great Britain, but it is otherwise in Ireland.—*Times*.

THE SANITARY CONFERENCE.—A three days' conference on "Sanitary Progress and Reform" commenced in Manchester on April 24 in connection with the annual meeting of the Manchester and Salford Sanitary Association. A meeting introductory to the conference was held in the Museum of Owens College, at which Professor Boyd Dawkins delivered an interesting address on "The Pre-Historic Traces of Sanitation." In the Palaeolithic Age dry areas were chosen for habitation, and Neolithic man chose spots with natural drainage. Towards the close of the Bronze Age the most elaborate system of refuse heaps was found, but there was no evidence of any artificial water supply. Neither in the Neolithic, the Bronze, nor the Pre-Historic Iron Age, however, were there any interments allowed within the area of habitation, and in that particular they could look back as far as those times for the example of a reform which was necessary in some parts of this country. In the

Bronze Age evidence that cremation was the rule was to be found in the limestone ranges of Derbyshire and on the chalk downs of Wilts. The excavations at Silchester showed an elaborate and perfect system of arterial drainage. It was resolved at the Sanitary Association meeting that a smoke abatement league should be formed for the purpose of suppressing the smoke nuisance, the nucleus of the league to consist of organisations at present existing in Manchester, Rochdale, Middleton, Oldham, and Bolton, and that the Committee of the Manchester and Salford Noxious Vapours Association should be requested to take immediate steps for the formation of a Committee of Management of the League.—The Bishop of Manchester said the Association would do a very useful work if it would print and circulate in large numbers a cheap edition of such papers as that which Lady Priestly had recently written upon "The Penalties of Ignorance."—Sir H. Roscoe, M.P., afterwards took the chair at the Conference Session, and in introducing the question of Smoke Abatement, said he agreed with a remark of the Lord Mayor, that whilst they paid attention almost entirely to the smoke from factory chimneys and from manufacturing operations, they had to deal with a larger question, namely, that of the smoke from ordinary household fires.—Mr. A. E. Fletcher, Chief Inspector of Alkali Works, delivered an address, in which he urged that the compulsory powers as to vapours from chemical manufactories should be given in relation to coal smoke. Until that was done he feared that the nut would hardly be cracked.—Dr. Cohen, of Yorkshire College, spoke of the work which had been done in Leeds in the way of interesting manufacturers and working people, and of taking observations of the extent of the nuisance.

DR. LUDWIG MOND ON THE STUDY OF CHEMISTRY.—In his speech at the opening of the Schorlemmer Laboratory, Dr. Ludwig Mond said he agreed that it was desirable to cultivate physical chemistry and inorganic chemistry much more than had been done, and he was very glad that the great supremacy which organic chemistry had enjoyed—more particularly in Germany, the home of chemistry—was now being contested by other and equally important branches of our science. But great, and very great, as had been the progress of organic chemistry, it had greater and more important problems still to solve; and in this country, which had given birth to so many of the most important steps in advance of that science, it had not received that amount of general attention which it had deserved in the past, and which it still deserved in the future. Schorlemmer had shown that, if to-day we could not make morphine, quinine, and similar bodies artificially, the time was near at hand. If we could not make quinine, we had already found a partial substitute in antipyrin, and its introduction into therapeutics had lowered the price of quinine considerably. Another important problem was the synthesis of the ingredients of our daily food, such as sugar, gum, and starch. Those bodies were nearly related to each other, for we could convert the two latter into different kinds of sugar, and sugars again into gums. That the synthesis of sugar was imminent had already been stated. But all attempts hitherto made for the purpose of producing living matter artificially had failed, and the enigma of life could only be solved by the synthesis of an albuminous compound. Professor Fischer, in a lecture delivered not long ago in Berlin, had expressed himself full of confidence that the time would arrive when we might attack successfully even the problem of the constitution and synthesis of the albuminoids, and might thus approach the problem

of the origin of life. Surely with such a prospect as the ultimate result of the pursuit of organic chemistry no amount of work, no amount of thought, no amount of time and trouble devoted to that study would be too much if it was well employed in leading successfully to the great end in view, although the goal might not be reached for generations to come.

EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.—The third annual meeting of the Association was held in the Pharmaceutical Society's House, 36, York Place, on Tuesday, the 14th inst., at 9 p.m., Mr. Peter Boa, President, in the chair.

The minutes of last meeting were read and approved. The Honorary Secretary (Mr. C. F. Henry) read the annual report and financial statement, from which it appeared that the Association had had a very successful session, and the year closed with an increased membership. During the year the Association had considered the practical difficulty arising from the prescribing of proprietary or stamped medicines, and 500 circulars had been issued to medical practitioners in the Edinburgh district, drawing their attention to the difficulties arising in this way and suggesting a means whereby they might be obviated. The Association had also secured from the Inland Revenue authorities a formal sanction of the extension of the concession as to labelling of Bland's pills to other similar preparations. The financial statement showed a balance in favour of the Association of £12 10s. 10d. Mr. D. Wyllie moved adoption of financial statement, Mr. R. J. Macdougall seconded, and unanimously adopted.

On the motion of D. Mackenzie, seconded by W. Burley, the report was adopted. Membership 62.

The Committee recommended that the Association picnic this year at Kinross, going by train to Perth and driving to Kinross by way of Bridge of Earn and Glen Farg. This was unanimously agreed to, and the picnic fixed to take place on June 12. Tickets, 12s. 6d. single, 23s. double.

The following office bearers were elected for next year:—Peter Boa, President; John Bowman, Vice-President; Claude F. Henry, Secretary and Treasurer; and Messrs. Aitken, Forret, Glass, R. L. Hendry, McGlashan, Wyllie, Leask, Smith, Maclaren, Macpherson, McDougall, and Lunan, as members of Committee.

On the motion of Mr. D. Maclaren, a hearty vote of thanks was awarded to the Chairman, and the meeting closed.

THE EXHIBITORS' ASSOCIATION.—At a meeting of intending exhibitors at the forthcoming British Medical Association Museum, held at the Queen's Head, Strand, on Thursday, May 2—

Mr. F. J. Rebman briefly stated that since the Museum Committee had sent out their circular bearing on the next museum, he had, as the chairman of the last exhibitors' meeting (held in November, 1894), received a great many intimations from various firms that urgent reasons rendered it advisable to call together another meeting for the purpose of discussing certain points of interest to the exhibitors. He had complied with these requests, and now took occasion to thank those present for having so promptly and universally responded to the call.

Mr. Rebman was then unanimously elected in the chair, Mr. H. W. Lane (Armour and Co.), acting as hon. secretary.

The Chairman drew attention to the great success achieved by last year's Committee in securing for the museum the first floor of the Examination Hall of the Royal College of Physicians and Surgeons, situated on the

Embankment near Waterloo Bridge, instead of the second floor as originally intended by the authorities, by which arrangement every medical man attending the sections now placed on the second floor would have to pass by the museum at least four times. This information gave general satisfaction.

The Museum Committee's circular (1895) was now read, and after a lengthy discussion which followed, a committee of seven, consisting of Messrs. H. N. Stroud (Richardson and Co.), Ball (Burroughs, Wellcome and Co.), Rebman, Longmate (Allen and Hanbury), Shorrock (Bovril, Ltd.), Weiss (John Weiss and Son), and Essinger (Hartmann's Wood Wool Co., Ltd.)—five to form a quorum, and Mr. Lane (Armour and Co), to act as Hon. Sec.—was appointed for the purpose of waiting on the Museum Committee with the following instructions:—

I.—To plead for a reduction in the prices charged for space.

II.—To ask for an increase in the height allowed for display on centre tables from 2 ft. 6 in. to 4 ft. as heretofore, and to 6 ft. against the walls.

III.—To request that no application for space be considered before a certain fixed date, and that space be allotted without regard to priority of application.

IV.—To ascertain what system the Museum Committee propose to adopt for the division of the space in the event of the applications exceeding the amount of space at their disposal.

V.—To suggest that the general public be not admitted, and that the exhibitors be informed of the date on which the hall would be cleared for their use.

It was proposed and unanimously carried, that an "Exhibitors' Association" be formed for the purpose of co-operation among themselves in everything appertaining to the interests of the exhibitors, and that a subscription of 5s. per annum be paid by each member towards a common fund, to cover incidental expenses.

Mr. Rebman was elected hon. treasurer.

The names of those present were entered as foundation members of the Exhibitors' Association.

After the roll call, the Secretary was instructed to send an appeal to all those firms who were not represented at the meeting, to join the Exhibitors' Association, and to ask for their subscriptions.

A vote of thanks was then offered to the Chairman, and also to Mr. Skelton, Manager of the Queen's Head, who so kindly placed the luncheon-room at the disposal of the meeting.

A further meeting of the Association was held on Wednesday last, but the report of the proceedings had not arrived at the time of going to press.

THE NEW DISEASE "PSITTACOSIS" FROM NEWLY IMPORTED PARROTS.—Professor Nocard (*Revue Internat. de Méd.*) has isolated a specific organism from the marrow of the humerus of a parrot, which is probably the infective cause of the well-marked febrile disease terminating in pneumonia, which has been traced to infection from ailing freshly-imported parrots, numerous cases of which have occurred in Paris since 1892. It is suggested that the sale of parrots by itinerant vendors should be restricted.

MYRCENE is a new hydrocarbon, obtained by Power and Kleber during the fractionation of oil of bay. It is a limpid liquid, having the formula $C_{10}H_{18}$, s. g., 0.8023 at 15° C., and index of refraction $[n]_D = 1.4673$.

Poisoning Cases and Inquests.

Strychnine.—Edward Rowles, a retired farmer, died on Monday, April 29, at Mistley, from the effects of strychnine, self-administered. Verdict: "Suicide during temporary insanity."

Poisonous Lotion.—A young man, named Rosser Richards, an accountant, died at Pontcymmer, on Wednesday, May 8, through drinking a small portion of a lotion supplied to him for the purpose of treating a bee-sting.

Oxalic Acid.—A woman named Hardwick died on Wednesday, May 8, at 341, Caerleon Road, Newport, from the effects of oxalic acid, contained in some baking powder.

Laudanum.—John Henry Hartley, aged 39, died on Sunday, May 5, at 42, Fitzwilliam Street, Sheffield, from the effects of laudanum, self-administered. Verdict: "Death from an overdose of laudanum administered by himself, probably to induce sleep."

Prussic Acid.—John Shipp, aged 41, died on Saturday, April 27, at High Street, Billericay, from the effects of prussic acid, self-administered. Verdict: "Suicide while of unsound mind."

Laudanum.—Matthew Wood, a middle-aged man, died on Friday, May 10, at Bolton, from the effects of laudanum, self-administered.

Strychnine.—At the inquest held on the body of James Hale (see *ante*, p. 1022), evidence was given to show that death was due to strychnine contained in a packet of Battle's vermin-killer, and the jury returned a verdict to the effect that deceased took his life while in a state of temporary insanity.

Prussic Acid.—Edward G. Knott, aged 55, died on Friday, May 3, at Margate, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst temporarily insane."

Spirit of Salt.—An inquest was held on Thursday, May 9, at Bishop Stortford, on the body of Thomas Searles, who died from the effects of spirit of salt, having been taken in mistake for whiskey. Verdict: "Accidental Death."

Corrosive Sublimate.—George Denning, a small farmer and dealer, died on Saturday, May 11, at Forton, near Chard, from the effects of corrosive sublimate, self-administered.

Obituary.

ARNOLD.—On May 6, Alfred Arnold, Chemist and Druggist, Cwm Avon. (Aged 79.)

APPLEBY.—On May 12, Calvert Appleby, Pharmaceutical Chemist, of East Retford. (Aged 47.)

WHEELER.—On May 2, John Wheeler, Pharmaceutical Chemist, Chipping Sodbury. (Aged 72.) Mr. Wheeler had been a member of the Pharmaceutical Society since 1847.

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

OPTICAL ROTATION OF AN OIL.

[856.] By "the optical rotation of an oil" is meant the power of the oil to rotate the plane of polarisation of a ray of light passed through it; rotation in the direction in which the hands of a watch move, or in the opposite direction, indicating dextro-rotatory (+) or levo-rotatory (-) power respectively. The instrument employed for determining the extent of the rotation is called a polarimeter, and substances capable of rotating the plane of rotation of a ray of polarised light passed through them are described as optically active. Since the angle of rotation depends upon the temperature, the nature of the substance examined, the thickness of the layer through which the polarised ray passes, and the wave-length of the light used, which should be mono-chromatic, it is usual to speak of the "specific rotatory power" of a substance. This is found by means of the following

formula: $[\alpha] = \frac{\alpha}{l \cdot d}$ in which $[\alpha]$ = specific rotatory power; α = angle of rotation of the plane of polarisation of light of stated wave-length; l = length of column of liquid in decimetres; and d = specific gravity of liquid referred to water. Observations are made at a common temperature, and the wave-length of the light employed is expressed by a letter below the bracket, thus $[\alpha]_D$ means specific rotatory power for light of wave-length D.

TRAUMATICIN.

[857.] A correspondent remarks that this preparation appears almost identical with liquor gutta-percha B.P., except that distillation is employed to remove a part of the solvent. A better way, he considers, is to employ gutta-percha tissue, and to add 1 part by weight—torn into small pieces—to 12 parts by measure of chloroform, contained in a glass-stoppered bottle with frequent agitation. A solution of fit consistence is thus quickly obtained.

ORIGIN OF CHEMICAL TERMINATIONS.

[858.] The terminations in the words "sulphate" and "sulphite" are of French origin. In 1787 the method of chemical nomenclature proposed by Morveau, Lavoisier, Berthollet, and De Fourcroy was published, and this still forms the basis of the present system. Lavoisier's ideas were most prominent in the scheme which was practically an embodiment of his antiphlogistic doctrines. The compounds of oxygen were divided into *oxides* and *acides*, and the names of the latter were distinguished by the terminations *-eux* (Ang. *-ous*) or *-ique* (Ang. *-ic*) respectively, according as the acids contained more or less oxygen. The important rule was also introduced, and is still maintained with its original force, that the names of salts formed from acids distinguished by names ending in *-eux* (*-ous*) should terminate in *-ite*, and those from acids in *-ique* (*-ic*) should terminate in *-ate*.

SYRUP OF FERROUS IODIDE.

[859.] A solution from which this syrup can readily be prepared, has been devised by M. Tripels, of Brussels as follows:—Resublimed iodine, 45 Gm., and iron filings, 2.0 Gm., with distilled water, *q. s.*, are allowed to react to form ferrous iodide. The solution is then filtered and made up to 17 Gm. with water, after which glycerin, 15 Gm., simple syrup, 15 Gm., and solution of citric acid (10 p.c.), 3 Gm., are added, the whole making 50 Gm. This solution is kept in colourless bottles exposed to the light and when it is required to prepare the syrup, 5 Gm. of it is mixed with syrup of orange flowers, 20 Gm., and simple syrup, 75 Gm. (*Ann. de Pharm.*).

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

*. * Queries will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTER.

BOTANICAL CURIOSITIES.—Mr. F. P. Balkwill, of Evesham, sends some specimens of *Viola odorata*, with cleistogamic flowers, found in a copse shaded by trees on a spur of the Cotswold Hills. They do not seem to have developed any normal flowers with the usual blue petals. He has also found a primrose with stamens and pistils of the same height, half the length of the corolla tube.

ANSWERS.

J. H. FRANKS, H. HOWORTH, and R. PAYNE.—Letters wrongly directed. See notice on page 1029.

T. H. MUIR.—We have no report of the matter you mention.

P. DAWSON.—See "Notes and Queries" column.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Aird, Barker, Bayley, Bennett, Butler, Bywater, Clarke, Clay, Cocks, Cripps, Dawson, Doig, Fitzgerald, Franks, Guyer, Gill, Green, Harrison, Hill, Hogg, Holloway, Hooper, Howorth, Kemp, Kirkby, Macartney, Marshall, Morley, Muir, Naylor, Payne, Perry, Rideal, Robinson, Schacht, Spottiswoode, Stark, Sutton, Thompson, Williams, Wright.

Publications Received.

[Publishers are requested to state the price of books sent for review.]

CHEMICAL TECHNOLOGY. Edited by CHARLES EDWARD GROVES, F.R.S., and WILLIAM THORP, B. Sc. Vol. ii. Pp. 398. Price 20s. (J. and A. Churchill, London.) From the Publishers.

ORGANIC CHEMISTRY, THEORETICAL AND PRACTICAL by ISAAC SYDNEY SCARF, F.I.C., F.C.S. Pp. 240 with 36 illustrations. Price 2s. (William Collins Sons and Co., Ltd., London.) From the Publishers.

ST. BARTHOLOMEW'S HOSPITAL REPORTS FOR 1894 edited by SAMUEL WEST, M.D., and W. J. WALSHAM, F.R.C.S. Vol. xxx. Pp. 332, with 7 illustrations and appendix. Price 8s. 6d. (Smith, Elder and Co., London.) From the Publishers.

REPORT ON THE HEALTH, SANITARY CONDITION, etc., OF THE BOROUGH OF HASTINGS FOR THE QUARTER ENDING MARCH 31, 1895. Pp. 4. From the Town Clerk.

REPORT OF THE ROYAL BOTANIC GARDENS, CRYLOW. By the Director, Mr. H. TRIMEN, M.B., F.R.S. From the Director.

THE ANNUAL DINNER OF THE SOCIETY.

The annual dinner of the members and friends of the Pharmaceutical Society was held on Tuesday, May 21, at the Whitehall Rooms, London, Mr. Michael Carteighe (President) in the chair. Amongst the guests were Sir F. Abel, Bart., F.R.S. (Director and Secretary, Imperial Institute), Dr. A. G. Bateman, the R. Hon. J. Bryce, M.P. (President, Board of Trade), Dr. F. H. Champneys (President, Obstetrical Society), H. J. Chaney, Esq. (Standards Department), Sir Dyce Duckworth (Treasurer, Royal College of Physicians), J. Laidlaw Ewing, Esq. (Chairman of Executive, North British Branch), Dr. R. Farquharson, M.P., Professor Michael Foster, F.R.S. (Secretary, Royal Society), Sir Walter Foster, M.P. (Parliamentary Secretary, Local Government Board), A. Vernon Harcourt, Esq., F.R.S. (President, Chemical Society), Christopher Heath, Esq. (President, Royal College of Surgeons), A. Braxton Hicks, Esq. (Coroner for S.W. London), C. R. Hodgson, Esq. (Secretary, College of Preceptors), Professor Victor Horsley, F.R.S., Dr. Padman, W. P. Paterson, Esq., F.R.C.S., Major C. Probyn, L.C.C., Sir Richard Quain, F.R.S. (President, General Medical Council), Dr. W. J. Russell (President, Institute of Chemistry), Professor J. Burdon Sanderson, F.R.S., (Regius Professor of Medicine, Oxford), Dr. T. Stevenson (President, Society Public Analysts), G. Thatcher, Esq. (Royal College Veterinary Surgeons), Dr. Thorne Thorne, C.B. (Principal Medical Adviser Local Government Board), Professor Thorpe, F.R.S. (President, Society Chemical Industry), Professor W. A. Tilden, F.R.S., C. S. Tomes, Esq., F.R.S., E. Trimmer, Esq. (Secretary, Royal College of Surgeons), Dr. Dawson Williams (*British Medical Journal*), Sir H. Trueman Wood (Secretary, Society of Arts).

The health of the Queen having been duly honoured, The PRESIDENT proposed "The Houses of Parliament." He said there were many Houses of Parliament in different countries, but he did not know of any form of Parliamentary Government which was so well adapted to a thoroughly constitutional and free people as that which prevailed in this country, or which had formed the model on which so many others had been framed. After referring to the difficulties in connection with imposing an income tax in the United States, he said he did not believe the statement which was sometimes made that Great Britain was no longer the leader of Parliamentary Government. Both in the House of Commons and the House of Lords there were men with as great ability as any who ever occupied a place there, and in the former men of mark alone had any chance of attaining a position. He concluded by a tribute to the merits of Mr. Bryce, President of the Board of Trade, whose name he begged to couple with the toast.

The Right Hon. JAMES BRYCE, M.P., in respond-

ing, said the British Parliament was a model which other nations had endeavoured to follow, and he hoped it would remain for many generations one of the greatest distinctions of the British race that it had not only produced a world-famous literature, and carried its arms and commerce into every part of the globe, but that in the sphere of constitutional arrangements had produced the most perfect system yet devised for combining the widest measure of freedom with an earnest, firm, and energetic executive, and he hoped that among all the experiments made by other countries to rival our institutions the British Parliament still stood at the head. Both Houses were alike in their antiquity, having come down from remote antiquity, and were alike also in possessing a large number of the ablest men in the country. He would say further that there never was a time when the House of Commons was more responsive to the least touch of public opinion than at present; or when any opinion or view which prevailed in any section of the country was more certain of finding exponents, and of being considered on its merits. In fact the House was becoming almost too sensitive to public opinion. It was perhaps too apt to encourage the view that there were no social evils and misfortunes for which Parliament could not find a remedy. He believed there were many things with which Parliament had better not meddle, but there was a growing tendency to invoke the intervention of Parliament on every occasion. The present House of Commons was not inferior in ability to any of its predecessors. Its life was supposed to be very uncertain, and it was rather peculiar that the uncertainty of its life bore no relation to the vigour it developed. He thought if it had a fault it was that it was a little too equally balanced, the consequence of which was that on all the members was imposed the task of being constantly present in order to look after the other side—they were always watching one another. It was a great pleasure to him to be present as a guest of the Society. In his official position he was struck with the fact that the Board of Trade was related to nearly every industry and occupation, and on asking the President in what relation the Pharmaceutical Society stood to the Board of Trade, he understood from him that the principal point was the question of the regulation of co-operative companies. He had been also much struck with the extent to which science was affecting every department of practical life and transforming every art and occupation. This was eminently the case with the occupation in which most of those present were engaged, and one of the consequences was that each art was organising itself on a regular, systematic basis in a way quite unknown to our forefathers, and he ventured to think that in that respect the Pharmaceutical Society was rendering great service to the community.

The VICE-PRESIDENT, Mr. W. Gowen Cross, next proposed "The Medical Profession," a toast which was popular in every civilised community, and the more civilised the latter the more popular was the toast. It was not necessary to en-

large on the intimate relations between pharmacy and medicine, and he would simply couple with the toast the names of Sir Richard Quain, President of the Medical Council, as representing in his official capacity the whole of the medical profession, and Mr. Christopher Heath, President of the Royal College of Surgeons.

SIR RICHARD QUAIN said the Medical Council was originally constituted for the benefit of the medical profession and the public, and though it had been constituted of rather incongruous elements, he could not doubt, seeing the names of those who were associated with it, that it would have, sooner or later, most important results. It included representatives of all the medical authorities in the kingdom, each of which then had its own special vocation and authority, and was jealous of all the others; but that period of jealousy had passed away, and he was happy to think that the Council was now doing exceedingly useful work. It had succeeded in extending the period of medical education from two and a half or three years to five years, which would ensure better educated men entering the profession, and it possessed a power greater than that of any court of law, for it could declare the conduct of any member infamous, and remove him from the roll, and from its decision there was no appeal. He trusted therefore in time every one who brought disgrace on the profession or injury to the public would be weeded out. The pharmacist supplied the materials with which the physician and surgeon had to combat disease, and he hoped this supply would be continued, and that they would not have medicines forced upon them from Germany or elsewhere. He protested against the idea of a medical man going about carrying his pharmacy in his waistcoat pocket. Ready-made physic, like ready-made clothes, was never a good fit, and he was not particularly in favour of new remedies with names so long that nobody could spell them. The Council was now engaged on a new Pharmacopœia, in which it had the assistance of many eminent pharmacists, and he hoped the result would be satisfactory, and that the medical profession and the chemists would long be associated in friendly intercourse.

MR. CHRISTOPHER HEATH (President of the Royal College of Surgeons), said he had the honour of representing a Corporation infinitely older than the body represented by Sir R. Quain. That body was only brought into existence in 1858 by Act of Parliament, but the Surgeons' came into existence in the time of Homer. Afterwards there was a corporation of barbers and surgeons, and later on the surgeons separated from the barbers for obvious reasons. Since then they had been a corporation by themselves, and they had to thank the Pharmaceutical Society for the work it undertook on their behalf. Professor Attfield informed him that they had 7000 answers to circulars with regard to the new Pharmacopœia, but not one from any member of the Council of the College of Surgeons. He could only say he was not surprised at it. Surgeons were very glad

to use drugs when necessary, but they used very few, and he did not think as a rule they employed those with the long names to which Sir R. Quain had referred. As he told Professor Attfield, he hoped they would not make any change in the strength of laudanum, and that the old and well-tried remedies would not be discarded.

THE PRESIDENT next proposed the toast of "Science," and in connection with it he wished especially to refer to the teaching of science. When he was young it was very hard for science to get a hearing, but things had changed since then, and there was now a great outcry about technical education, which, as he understood it, meant that those who had to do with any particular branch of art or manufacture should know the conditions precedent upon which their practice depended. Elementary science was the condition precedent to all technical education. Many years ago, when text books of science were few and far between, the Hon. Robert Boyle was once asked what should be done with a sum of £10,000 lying to his credit at the bank, and it was suggested that it should be re-invested. His reply was—Do not trouble me with these matters of detail. Perhaps men of science nowadays were not so indifferent to matters of business, and at any rate there was great competition amongst them for distinction and priority of discovery. A great deal had been done for the teaching of science by the University Colleges, and now the County Council were also joining in the work by establishing technical schools. He coupled with the toast the names of Professor Michael Foster and Mr. Vernon Harcourt (President of the Chemical Society).

Professor MICHAEL FOSTER said he was taken quite by surprise, and he could not make a speech, but he would tell them a tale. The other day, feeling indisposed in Bond Street, he entered a chemist's shop at hand, and asked the urbane gentleman behind the counter for a soothing draught, which was furnished to him, and his indisposition disappeared; whether the compound given to him contained some phenyl in it or not he did not know, but there seemed to be a change in his mind. There was an old saying that it was good to see ourselves as others see us, and under the influence of that draught he obtained an outside view of men of science. He remembered a friend telling him once men of science are the most cock-sure people he ever met, and under the influence of that draught he saw it. He saw that men of science were Pharisees of the worst description, who always had written on their phylacteries, "We are the salt of the earth, we are always sitting upon a hill with the kingdoms of the world spread before us." He could assure them he was dreadfully affected at that view; he said to himself, there are a set of men who, if ever power fell into their hands, would prove a tyranny in comparison with which that of the Church of Rome in the palmy days of the Inquisition would be mild, and he said to himself the whole remainder of your life must obviously be devoted to counteracting this terrible and dangerous power. But then the effect of

the draught began to pass off, and he saw there was something to be said for men of science, amongst other things that the very spirit which gave them such power that if their brother's neck were placed beneath their heel so that they could crush it at once, at the same time took away the desire to injure; for the very spirit which gave them that power immediately set them on wings to obtain other results, starting from those which they had already obtained so that they never stooped to make a practical use of the powers which they had gained. He saw also that they were happily divided amongst themselves, that the very spirit of a scientific man was to believe that his brother was a liar, and that his one duty was to prove it, and he said to himself that tyranny so divided amongst itself could do no harm to mankind. Then he turned from the men of science to the work of science itself, and was not this a work which had turned the world upside down? Was it not, as Mr. Bryce had said, a work which was felt everywhere, a great flowing tide, covering the plains and surging up into every nook and corner, and was there any place where this influence was more felt than in the Pharmaceutical Society? The work which science was doing was a work of many kinds, and like everything in this world, the good brought more or less evil with it. There was a time when the life of a chemist and druggist was a simple matter, when a green and red bottle, a courteous manner, and a certain skill in capping a one-and-a-half ounce phial brought in his income. Those days had gone by, and the success of each one now, wherever he might be, in London, in a country town, or in a village, depended on the ability with which he could apply the results of science. It was no use saying they had too much science, or too much of scientific men, they must have them, and they had better make peace with them at once, and take such help as they were prepared to offer.

Mr. VERNON HARCOURT said he had no doubt that his name was coupled with the toast in consequence of his connection with a science on which pharmacy was so greatly based, having at present the honour of occupying the position of President of the Chemical Society. There was only one point in the remarks made by his friend Professor Michael Foster, on which he felt a little inclined to differ from him, and that was when he represented that scientific men were unduly critical one of another. Seriously that was not his view of the present attitude of science. He thought if scientific men had a failing it was rather the too ready acceptance of anything put forward by anyone in authority, and the too great readiness to model all they had to say and the theories on which their facts were to be hung according to that which was fashionable at the time. He thought it extremely probable that the many theories now accepted and considered necessary for the student, and even for the teacher, would in time to come be regarded by those who followed them in the same way as they now looked back upon the theory of "phlogiston," something extremely difficult for a scientific man even to picture

to himself as having entertained. He thought Mr. Foster would agree with him in saying that there was a danger on both sides, that whereas in particular cases they might be too critical, there was also a danger, and perhaps a greater danger, of their being too much inclined to follow in the steps of one another. He quite understood how the science of chemistry must be concerned in the practical services which pharmacists were rendering to their fellow-countrymen, and knew that the earlier part of the education of those present had taken place in the chemical laboratory. As the President had said he would particularly connect science with the teaching of science; he might add that that was the part of science in the pursuit of which the great part of his life had been spent. It was one of great interest, and a life might be spent not only in a pleasant but in a useful way in teaching the elements of chemistry to the rising generation.

Dr. THORNE THORNE, F.R.S., next proposed the toast of the evening, "Prosperity to the Pharmaceutical Society of Great Britain." He said his branch of medicine was preventive rather than curative, and he had, so to speak, discarded drugs, but he must at once admit that he had not succeeded, and that the value of drugs and of therapeutics stood as high as ever it did. He would also point out that when he came to think this matter over the work of the Pharmaceutical Society seemed to form a link between those two branches of the profession, because whatever they could do with preventative medicine they were still obliged to come to the chemist for prevention as well as cure. At this time they had approached an era in medicine when they, perhaps, needed more than ever a scientific chemist and pharmacist. They were face to face, even in his branch of the profession, with the fact that there were certain micro-organisms of disease which attacked the human body, where they formed chemical poisons or toxins, which travelled, as it were, from one part of the body to another, and in remote parts and organs created mischief which was fraught with disease and death. They wanted, if possible, to trap these organisms and treat these toxins with what were called anti-toxins, and they were at the present moment seeing how they could in the first place prevent the multiplication of these organisms, and what to employ by way of anti-toxin, which should check the operation of these poisons, follow them, or even go before them, and so prevent mischievous reactions, so that after all they came back to the chemical aspect on their side of the profession. When he looked at the Charter of their Society he found there were three things set forth: there was the protection of a honourable business, conducted by honourable men, a highly desirable object, but the founders did not place that first. Then there were philanthropic and charitable objects, but those again were not placed foremost, and the one thing which the founders of the Society placed in the foreground was the advancement of chemistry and pharmacy. At the present stage when they found the

enormous value of chemistry in connection with toxins and anti-toxins they might feel proud that their predecessors had such marvellous foresight, and looked forward to the day when chemistry in relation to bacteriology was likely to take so prominent a place, so that now in 1895 they were realising one of the primary objects which the founders had in view. He begged to couple with the toast the name of the President, Mr. Michael Carteighe, to whom might be applied the motto by which the ancients referred to the dead—*nil nisi bonum*.

The PRESIDENT, in responding, said Dr. Thorne Thorne succeeded a man of very great eminence in Governmental affairs in relation to scientific pharmacy; he was probably a baby when Sir John Simon was ruling the Privy Council on all matters connected with public health. He was followed by Sir Geo. Buchanan, a man who in all his works showed that manly sentiment which all must respect. In fact, he was not sure that he was not a little too incisive in some respects; but, on the other hand, he did not see why a principal Medical Officer of the Government or any other person in a responsible position should be ashamed of insisting on certain views which he held to be for the welfare of the community.

The PRESIDENT again rose and proposed "The Guests," coupling with the toast the names of Dr. Burdon Sanderson (Regius Professor of Medicine, Oxford), Sir Dyce Duckworth, and Dr. Russell (President of the Institute of Chemistry).

Dr. BURDON SANDERSON, in reply, said he had been engaged in teaching physiology for many years, and was now engaged in teaching what might be called elementary science. Their endeavour was to promote that science, and the University of Oxford had taken great part in the movement that was now going on for what was called university extension, which was nothing more than the teaching all over the country of elementary science. He entirely sympathised with the feeling that in that way only could education be really promoted. As to the special subjects of pharmacy and therapeutics he felt the immense importance of introducing more and more into medical education the study of pharmacology, or the thorough scientific knowledge of the modes of action of drugs, and in this line he thought they were doing the same work as the Pharmaceutical Society.

Sir DYCE DUCKWORTH also returned thanks. He said he was interested in pharmacy as a member of the Pharmacopoeia Committee of the General Medical Council. With reference to that work thousands of recommendations were coming in on all hands from all sorts of persons who were qualified more or less to advise on the subject. As a somewhat old-fashioned person he ventured to put in a plea for the old-fashioned remedies. The best edition of the Pharmacopoeia in his opinion was that of 1851, for with every subsequent edition his sorrows had increased. He was old-fashioned enough to hope that they would not lose sight of many of those drugs which doctors had been accustomed to use, which experience showed had been of use, and he believed they would continue to be of use so long as medicine was an art.

Whilst they must not stagnate, but endeavour to keep progress with the advance of knowledge, at the same time they must not neglect those preparations for which they were indebted to the wisdom of their forefathers, which he believed would be useful for all time.

Dr. RUSSELL also briefly responded, and the proceedings then terminated.

BOTANICAL NOTES.

SENSITIVE MOVEMENTS OF PLANTS.—Dr. J. M. Macfarlane publishes the results of a series of experiments on the effect of coloured screens on the sensitive movements of leaves (*Oxalis stricta*, and several species of *Cassia*). He finds the exciting agents of the movements to be certain of the light-rays. When sensitive plants are placed behind coloured screens, the leaflets fold up as in the nyctitropic state, most strongly under red, less so under yellow, only feebly or not at all under green light; while under blue screens the leaflets remain open as in ordinary daylight. In all cases nyctitropic movements are accelerated behind a red screen, not quite so strongly behind a yellow screen, while behind a green screen the movements practically coincide in time with those of exposed plants, and are beautifully regular in sequence; under blue light there is a distinct retardation of the normal nyctitropic period. Up to 38° C., or even 43° in some species, heat-rays appear to fail in stimulating the tissues. The general result of these experiments is that the heat-rays, the less refrangible rays, and the more refrangible rays, are all efficient up to a certain point in inciting nyctitropic movements. Orange, yellow, and green screens to the protoplasm, whether in the form of pigmented walls, pigmented cell-sap, or chlorophyll, are of a protective character, and permit the normal functions to be carried on unimpeded by the injurious action of the more intense blue-violet rays (*Botanisches Centralblatt*, vol. lxi., 1895).

AMOUNT OF LIGHT WHICH IS FAVOURABLE TO THE GROWTH OF PLANTS.—Herr J. Wiesner has come to the following conclusions on this subject:—Those plants which, like *Lemna*, receive an unlimited amount of light on all sides, do not produce a maximum of organic substances. In by far the greater number of plants the amount of light absorbed is diminished by the form and position of the organs. In trees this amount is reduced, in the peripheral portion of the foliage, to one-half or one-third, in the central portion to as little as one-eighth of the possible amount of light. All luxuriant vegetation is produced under conditions of comparatively feeble, and especially of diffused, daylight. Intense light is of no advantage to a plant growing in unfavourable conditions, especially in poor dry soil. Although the actual amount of light enjoyed by trees and shrubs is greater in tropical than in temperate regions, yet in the latter the leaves of deciduous woody plants receive a more intense light than those of the former at one particular period of the year, namely, at the commencement of the period of vegetation (*Ber. Deutsch. Bot. Gesellschaft*, vol. xii., 1894; *General-Versammlungs-Heft*, p. 78).

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, MAY 25, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to the Publishers, 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders should be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

THE SOCIETY'S ANNIVERSARY.

THE reports published in this week's Journal of the meetings connected with the annual celebration of this event are so full that it is unnecessary in this place to do more than refer to some of the more salient points of the proceedings of the past week. Among these it is especially satisfactory to note the continued and increasing interest taken in the Pharmaceutical Society and its work outside the ranks of those actually engaged in the practice of pharmacy. This is evidenced not only by the presence at the annual dinner of distinguished guests representing Government departments, Parliament, science, and the learned professions, but also by the appreciative remarks made by them in responding to various toasts. No better proof could be furnished as to the utility of the Society's work and of the fact that its beneficial influence in regard to the interests of the public has been very generally recognised. This circumstance should serve as a satisfactory answer to the somewhat disheartening questions sometimes heard within the pharmaceutical body as to the usefulness of the Society and the need for supporting it as a representative organisation. In this connection it was matter for congratulation to hear a prominent official connected with an important State department speak with emphatic approval of the constitution and objects of the Society, and it was no less satisfactory to find the head of another great State department—impressed with the intimate relation existing between it and every kind of industrial occupation—interesting himself as to the particular nature of that relation which obtains in the case of those engaged in the practice of pharmacy, and seeking for information on that point. The sympathetic expres-

sions of eminent representatives of science and of the medical profession in regard to the Society's educational work, and its participation in the task of pharmacopœia revision, were also proof that the advance towards improvement effected through the medium of the Society, in the qualification and position of the pharmaceutical body, has been recognised and appreciated in such a manner as to be of practical value.

The subjects discussed at the Annual Meeting were less varied than on some previous occasions, though the Council report referred to several of great immediate importance. In the PRESIDENT'S *résumé* of the report attention was prominently directed, retrospectively, to the legal decisions as to the construction of the Pharmacy Act, and prospectively to the impending revision of the British Pharmacopœia, as well as the possibility of amended legislation in regard to weights and measures. Subsequently, in reply to the remarks of Mr. CAMPKIN and Mr. MACKENZIE on further pharmaceutical legislation, the PRESIDENT stated that the subject has been under consideration, and will, no doubt, be reported upon when the new Council meets. The question to be settled relates mainly to the scope of a Pharmacy Bill, and whether any attempt to deal with the evil of company trading should or should not be made at the same time as provision for consolidation of the Society. While a demand is being made for legislative protection, the fact is lost sight of by many that only a very partial advance has been made towards a professional position which would justify that demand. Even in the case of the medical and legal professions efficient power to protect the interests of their members is rather the result of internal organisation than of legal enactments, such as the Apothecaries Act, which are at best difficult to enforce, and, to a great extent, little more than theoretically restrictive. The existing necessity for registration from the point of view of public interests, affords a valuable basis for protective organisation of chemists and druggists; but for carrying out any scheme that would secure greater protection of their trade interests it would be essential to adopt various self-denying ordinances to which many of those engaged in the business are not disposed to agree, or could not at present bear.

ELECTION OF COUNCIL.

THE counting of the votes recorded in connection with the election of the Pharmaceutical Council was proceeded with on Thursday last, and the result announced at the adjourned general meeting on the afternoon of that day. Particulars are published at page 1075, and it will be seen that all the retiring members who had accepted nomination have been returned, together with Messrs. Corder and Savory.

NEW SERIES OF THE JOURNAL.

In a few weeks the *Pharmaceutical Journal and Transactions* will have existed for fifty-four years, and will celebrate its twenty-fifth anniversary as a weekly record of the progress of pharmacy in general and of the proceedings of the Pharmaceutical Society of Great Britain in particular. Originally a private venture, it was edited during the first eighteen years of its existence by its founder—JACOB BELL, under whose fostering care it gradually became “a vehicle for the publication of all the progressive improvements and discoveries in pharmacy and the sciences connected with it, in addition to such elementary and practical information as is likely to be useful to the student” (*vide* Preface to the Third Volume). The Transactions of the Pharmaceutical Society formed a distinct portion of each monthly number, but the greater portion of the space available was occupied with matter which was dealt with from a perfectly independent point of view, in this first series of the Journal. At BELL's death in 1859, the Journal became the property of the Pharmaceutical Society, and naturally assumed a more pronounced official character, certain changes being found desirable as a matter of expediency. The intervals of publication were not altered, however, and the Journal was conducted on much the same lines as formerly, until the conclusion of the second series in 1870. In July of that year commenced the publication of the Journal in a new form and as a weekly periodical. It was enlarged to its present size, and has ever since continued to deal with a greater quantity and variety of matter.

Concerning what has been accomplished in the last quarter of a century it is needless to say anything at the present time, but it is interesting to recall the words (*vide* Introductory Article, July 2, 1870) in which it was imagined that JACOB BELL might fitly have apostrophised British pharmacists at the time the third series commenced. “Love of science has increased immeasurably in the minds of chemists and druggists, let the special sciences of our trade have due space accorded to them; but fail not also to remember that we have still a trade to care for, and let not the questions concerning that trade be overlooked.” With regard to this point it has been felt for some time past that the lines on which the Journal was being conducted did not sufficiently meet the requirements of pharmacy as a trade. This was not the result of any change in the principles on which the subject matter had been selected during so many years, but rather on account of a development in the ideas of readers with regard to what they considered necessary; whilst, therefore, endeavouring to fully maintain the character of the Journal as a faithful record of progress in pharmacy and the sciences of which a knowledge is essential to a proper acquaintance with pharmacy, an attempt has been made during the past few months to ascertain in what respects change or alteration might be desirable.

As a result of this experiment, it has been

decided to continue much of what has so far been tentative only, and it is thought that this affords a favourable opportunity for beginning a new series in which important changes may be effected. Accordingly, the Journal, of which the title will henceforth be abbreviated to the *Pharmaceutical Journal* only, will appear on July 6 next with pages of larger size than at present and new type. Two volumes will be completed during each year instead of one, as at present, thus obviating the tendency to excessive bulkiness when bound. This alteration will have another effect of greater importance, viz., that of reducing the time during which an index is not available for the current volume by half. As regards contents, they can only be referred to in general terms. Whilst scientific matters will continue to be regarded of as great importance as heretofore, professional and trade interests will also receive the fullest possible attention. Pharmaceutical students will continue to receive as much consideration as at any time during past years, and subsidiary matters of interest to pharmacists will be dealt with from time to time. The new element, so important a factor since the advent of the newer journalism, will not be neglected; for securing the success of this department of the Journal, the Editor hopes to obtain assistance from members and associates of the Society throughout the country by the forwarding of any items of interest with which they may become conversant. This suggestion is made with the idea that the members and associates should recognise in the Journal a co-operative undertaking, in which they are virtually shareholders, and as such especially interested in its success. In conclusion it may be stated that, with a view to making the proposed changes known as widely as possible, the first issue of the new series will be sent to every chemist in business in the United Kingdom, as well as to a large number in the Colonies, India, the United States, etc., the total circulation on this particular occasion being expected to exceed 16,000 copies.

CHEMICAL WORKS INSPECTION.

In his annual report for 1894, Mr. C. E. FLETCHER, chief inspector of alkali works, says the number of works now registered in England, Ireland, and Wales under the Act is 1056, of which 102 only are alkali works proper, while 954 come under the schedule of other works which have more recently come under its provisions. These numbers show an increase of one alkali work and of nine other works since 1893. The number of visits paid by the inspectors to the works is irregular, and depends on the process there carried on, and the usual condition of the work. When there is no apparent need for repeated visits they are made about once a month. The kind of examination varies in the different works. In the case of the alkali works there is a limit laid down of the amount of muriatic acid gas which may escape without contravening the provisions of the Act. The amount may be stated either in relation to that being produced at the time, or absolutely in grains per cubic foot of the escaping gases. In sulphuric acid works also a definite limit is fixed. In other cases the provisions of the Act are complied with if the best practical means have been employed to prevent the escape of noxious gas.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, May 22, 1895.

Present—

MR. MICHAEL CARTEIGHE, PRESIDENT,
MR. WILLIAM GOWEN CROSS, VICE-PRESIDENT,
Messrs. Allen, Atkins, Bottle, Gostling, Grose,
Harrison, Hills, Martin, Martindale, Newsholme,
Schacht, Southall, Warren, and Young.

PHARMACOPEIA COMMITTEE.

The SECRETARY read the following letter from Professor Greenish, Secretary to the Pharmacopœia Committee:

"May 22, 1895.

"To the President and Council of the
Pharmaceutical Society.

"Gentlemen,

"I am instructed to report to you that, with the view of procuring the information desired by the General Medical Council, the Pharmacopœia Committee has prepared a list of proposed omissions from, and additions to the British Pharmacopœia, and distributed 550 such lists to local secretaries and other pharmacists throughout Great Britain, inviting them to record their experience of the extent to which each preparation is in use, and also to make any addition they might consider desirable to either list. Two hundred and thirty-two of these lists, comprising nearly 81,000 entries, together with 157 extra omissions and 163 extra additions, have been received, collated, and discussed.

"At a meeting held on Thursday, May 16, 1895, your Committee recommended that the two enclosed lists be forwarded to the President of the Medical Council without delay.

"I am,

"Gentlemen,

"Yours obediently,

"HENRY G. GREENISH

"(Secretary to the Pharmacopœia Committee.)"

REPORT OF THE PHARMACOPEIA COMMITTEE OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.

LIST I.

OMISSIONS.

Articles and Preparations the Omission of which from the British Pharmacopœia is Recommended by the Pharmacopœia Committee of the Pharmaceutical Society of Great Britain.

Acetum	Beberina Sulphas
Acetum Cantharidis	Belæ Fructus
Acidum Aceticum Dilutum	Bismuthi et Ammonii Citras
Acidum Lacticum	Bismuthum
Acidum Lacticum Dilutum	Bismuthum Purificatum
Acidum Meconicum	Calci Sulphas
Aconiti Folia	Cambogia
Alcohol Amylicum (transfer to Appendix)	Canellæ Cortex
Ammonii Nitras	Cataplasma Carbonis
Ammonii Phosphas	" Conii
Amygdala Amara	" Fermentii
Anisi Stellati Fructus	" Lini
Antimonium Nigrum Purificatum	" Sinapis
Aqua Pimentæ	" Sodæ Chlorinatæ
Argenti et Potassii Nitras	Cerevisiæ Fermentum
Argentum Purificatum	C-traria
	Charta Sinapis
	Cinchonæ Cortex. (Source of Quinine)

Cinchonidina Sulphas	Morphina Sulphas
Cinchonina Sulphas	Mucilago Amyli
Confectio Opi	Neotandra Cortex
" Rosæ Caninae	Oleo-resina Cubebæ
" Scammonii	Oleum Copalibæ
" Terebinthinæ	" Phosphoratum
Cupri Nitras	" Pimentæ
Cuspariæ Cortex	" Rute
Cusco	" Sabinæ
Decoctum Cetrariæ	Os Ustum
" Granati Radicis	Ovi Albumen
" Hordei	" Vitellus
" Papaveris	Physoctigmina (alkaloid)
" Pareiræ	Picrotoxinum
" Quercus	Piliula Aloes Socotrinae
Hoballii Fructus	" Cambogiæ Composita
Elaterium	" Ferri Carbonatis
Elemi	" Scammonii Composita
Emplastrum Ferri	Pimenta
" Plumbi Iodidi	Plumbi Carbonas
Enema Aloes	" Nitras
" Asafoetida	Potassii Cyanidum
" Magnesii Sulphatis	" Ferrocyanidum
" Opi	" Tartaræ
" Terebinthinæ	Prunum
Extractum Aconiti	Quercus Cortex
" Belæ Liquidum	Rhamni Frangulae Cortex
" Calumbæ	Rosæ Caninae Fructus
" Colchici	Sabinæ Cucumina
" Jaborandi	Santonica
" Jalapæ	Sodii Arsenias (cryst.)
" Lactucæ	" Nitris
" Lupuli	" Valerianæ
" Papaveris	Sodium
" Pareiræ	Spiritus Cajuputi
" Quassia	" Cinnamomi
" Rhamni Frangulae	" Juniperi
" " " Liq.	" Lavandulae
" Stramonii	" Vini Gallici
Farina Tritici	Stramonii Semina
Ferri Peroxidum Hydratum	Sumbul Radix
Ficus	Suppositoria Acidi Carbolici cum Sapone
Glycerinum Acidi Gallici	Suppositoria Acidi Tannici cum Sapone
Granati Radicis Cortex	Suppositoria Hydrargyri cum Morphinae cum Sapone
Hemidesmi Radix	Syrupus Ferri Subchloridi
Hordeum Decoctatum	" Hemidesmi
Hydrargyri Persulphas	" Rosæ Gallicæ
Infusum Anthemidis	Tabaci Folia
" Caryophylli	Tinctura Aloes
" Catechu	" Cocci
" Cuspariæ	" Croci
" Cusco	" Ergotæ
" Jaborandi	" Ferri Acetatis
" Krameriæ	" Gallæ
" Lini	" Jalapæ
" Lupuli	" Laricis
" Maticæ	" Sabinæ
" Uvae Ursi	" Stramonii
Kamala	" Sumbul
Lac	" Veratri Viridis
Lactuca	Trochisci Catechu
Laricis Cortex	" Ferri Redacti
Linimentum Hydrargyri	" Opi
Liquor Acidi Chromici	" Sodii Bicarbonatis
" Ammonii Acetatis	Unguentum Antimonii Tartarati
" Ammonii Citratæ	Unguentum Caleminæ
" Antimonii Chloridi	" Conii
" Calci Chloridi	" Creasoti
" Calci Chlorinatæ	" Elemi
" Chlori (transfer to Appendix)	" Eucalypti
Liquor Coccalnæ Hydrochloratis	" Gallæ
" Ferri Acetatis	" Hydrargyri Compositum
" Ferri Pernitratæ	Unguentum Plumbi Acetatis
" Hydrargyri Nitratæ	Unguentum Potassæ Sulphuratis
" Acidus	Unguentum Sabinæ
Liquor Lithis Effervescens	" Terebinthinæ
" Magnesii Citratæ	Uvae
" Morphinae Acetatis	" Uvae Folia
" " Bismecanatis	Vapor Acidi Hydrocyanici
" " Sulphatis	" Chlori
" Potassæ Effervescens	" Conine
" Sodæ	" Iodi
" Sodæ Effervescens	Veratri Viridis Rhizoma
Lotio Hydrargyri Flava	Vinum Aloes
Lupulin	" Ferri Citratæ
Manganesi Oxidum Nigrum	" Rhei
Marmor Album	Zincum
Mastiche	" Granulatum
Maticæ Folia	
Mica Panis	
Mistura Creasoti	
" Ferri Aromatica	
" Olei Ricini	
" Scammonii	
" Spiritus Vini Gallici	
Mori Succus	

LIST II.

ADDITIONS.

Articles and Preparations the Addition of which to the British Pharmacopœia is Recommended by the Pharmacopœia Committee of the Pharmaceutical Society of Great Britain.

Acidum Hydrobromicum, sp. gr. 1.908	Gossypium Iodoformi
Acidum Hypophosphoreum	" Phenolis
Ammonii Iodidum	Gualiscol Carbonate
Benzonaphthol	" Crystals
Bismuthi Salicylas	Hydrarg. et Zinc. Cyanidum
Caffeina Citras Effervescens	Icthyol
" Hydrobromas	Linimentum Menthol
Carbasus Hydrarg. et Zinci	" Capsici
Cyanidi	Linteum Acidi Borici
Carbasus Iodoformi	Liquor Cocci
" Phenolis	" Pancreaticus
" Sal. Alembroth	Lotio Acidi Borici
Chloralamide	" Carbolicci
Chloroformum Camphoratum	Morphina Tartras
Chrysarobium Purificatum	Naphthalene
(commonly known as Chrysophenic Acid)	β. Naphthol
Cocaina (alkaloid)	Ol. Carbollisatum
Codeina Phosphas	Phyostigmatus Sulphas
Elixir Auranti	Quinina Hydrobromas
" Cascade Sagradae	" Paeophas
Emplastrum Bellad. Liquidum	" Salicylas
Extractum	" Valerianas
" Gummi Rub. Liquidum	Resorcinum
Extractum Hamamelidis (P.G.)	Salol
" Dest.	Sodii Arsenias Exsiccatus
" Ipecacuanhae Liquidum	Solutio Ethyl Nitritus
Extractum Iridis Sicc. (Iridin)	" Hydrogeni Peroxidi
" Jaborandi Liquidum	Strychnina Sulphas
"	Syrupus Codeinae
Extractum Malti	Syr. Ferri Phosph. Comp.
" Malti cum Ol.	" et Quin. et Strychn.
Morrhue	" Phosph.
Extractum Malti Liquidum	Syr. Ferri Hypophosph. Co.
" Tritici Liquidum	" " Picis Liquidas
Eucalyptol	" " Pruni Virg.
Glycerinum Acidi Borici	Terebene
" Belladonnae	Tinct. Ergotae Ammon.
" Pepsinae Acidum	Troch. (or Pastill.) Cocain.
Glycerogelatinum	Hydrochlor.
Gossypium Acidi Salicylici	Troch. (or Pastill.) Codeinae
" Sal. Alembroth	" Gummi Rub.
	" Krameria
	Unguentum " Hydrarg. Ox.
	Flavi

The PRESIDENT moved that the report and recommendations of the Pharmacopœia Committee be received, and that the result of the Committee's work be communicated to the Pharmacopœia Committee of the General Medical Council, in accordance with the terms of Sir Richard Quain's letter of December 12, 1894.

The VICE-PRESIDENT seconded the motion, which was carried unanimously.

RESTORATIONS TO THE REGISTER.

Certain members who had neglected to pay their subscriptions within the prescribed time, but had since done so, were restored to the register.

The Council then arranged the order of business for the annual meeting, and then adjourned to the annual meeting.

FIFTY-FOURTH ANNUAL MEETING.

The fifty-fourth annual meeting was held on Wednesday last at 17, Bloomsbury Square, W.C., Mr. Michael Carteighe (President) in the chair.

The notice convening the meeting having been read, the annual report (*ante*, p. 993) was taken as read.

The PRESIDENT said: Ladies and Gentlemen, it is my duty as well as my privilege—after so many years I do not know that one can consider it a pleasure—to present the annual report to the members. The paragraphs in that report do not require very much expanding on my part, as I think they speak very largely

for themselves. In the first place I may refer to the fact that we have been spending some money, as you observe, in Scotland, but we feel that all those who are associated with us in the Society will approve of that expenditure, inasmuch as the premises, on which a comparatively large sum has been spent, and some more is to be spent, are now admirably equipped for the special part of the Society's work in Scotland. We exist, as you know, for two purposes. First, we are a voluntary Society, and have to do various matters in that capacity; secondly, we are practically a department of the State endowed with duties with regard to examinations, and it is our duty in the latter capacity to see that the conditions under which our examinations take place should be such as should commend the report to the public and the approval of the Privy Council. Therefore, in adding to the Society's rooms in Edinburgh, in giving them facilities for practical work and a large Board room for the meetings of the Board, we have done only what I conceive to be our duty for the proper conduct of the examinations. Anything additional we have done, or may do, will be for making that house in Edinburgh as well fitted for the general purposes of pharmaceutical business as possible. I take it that no member of this Society would grudge any moderate expenditure which would tend to show to everyone in Edinburgh and London that the Pharmaceutical Society of Great Britain is a living concern, that it has a house to keep, and that the house, whether in Edinburgh or London, is kept in good order.

EXAMINATIONS.

I have nothing to say on the subject of examinations at the present moment. The conditions under which the examinations have been conducted during the last two or three years have been somewhat different from what they were formerly, and I am in hopes that when once the candidates get to understand the nature of the examinations—some of you may smile when I tell you that they have not yet altogether got to understand it; in time they will get to understand it, sometimes by failing, amongst other things, but when they do understand the nature of the examinations and the necessity there is for spending a proper amount of time and money before presenting themselves—the new system will work well, and we shall have fewer failures. It certainly is not a pleasant thing for anyone occupying my position to have to call attention to the number of failures.

REVISION OF THE B.P.

With reference to the Pharmacopœia Committee, it is known to most of you that the Medical Council has to take the necessary steps for producing a new Pharmacopœia, that application has been made to the Council of our Society for assistance in the matter, and that a committee has been formed for the purpose of gathering the necessary statistics, and so on. The precise form in which the Society will eventually be asked to give its assistance we, of course, do not yet know; the matter, I believe, will be discussed at the meeting of the General Medical Council, which takes place next week, and probably some propositions may be sent to us, and something practicable may be put before us to do, or some investigation may be sent to us eventually to be made with the view to producing the necessary material for a new volume. You will remember also that it is proposed as far as possible to make this Pharmacopœia one which shall be national in its widest lines—imperial in fact, covering Canada and the whole of the British Empire. It may turn out that the sanguine expectations of some members of the Medical Council, and notably those of

Professor Attfield, may not be quite borne out by the facts; there may be more to do than they suppose, and that may involve some delay. I only refer to the matter now to say that I am sure you will allow me to state on your behalf that whatever help is required in the production of this volume, whatever may have been from time to time our criticisms on that volume, the Council of this Society, through its members and its officers, will do, as it is its duty to do, everything to assist the Medical Council in producing a satisfactory Pharmacopœia!

LEGAL BUSINESS.

Now, gentlemen, the paragraph in regard to law proceedings is one that I think it my duty specially to speak to you about at this meeting. It refers very specially to two particular cases. The case of Armson, in which there was an appeal against the decision of the County Court Judge as to what is a statutory poison, viz., how much poison comes within the meaning of the word "poison" in law. At present I think I may say it seems to be about one-eighth of a grain of morphine per oz.; that is what it comes to. Armson sold a proprietary preparation which I must not refer to because it might be libellous. His case was fought out, as most of you know who have taken an interest in the matter, and carried to the Court of Appeal. It was not only carried to the Queen's Bench, but on to the Lords Justices of Appeal, and those of you who have not read the judgment given by those Lords Justices I think would do well to turn it up and read it. I think you will see in the judgment of the Master of the Rolls and of the Lords Justices a number of useful observations which point strongly to the fact that the Society is doing its work well, and that we are justified in seeing that the law is obeyed with regard to the sale of articles containing comparatively minute quantities of poison. One thing which that judgment shows more clearly than another is that in law our term "preparation" does not seem to mean much. If you sell a poison mixed with water or anything else you sell the poison. Therefore, I think we may dismiss the word "preparation" in fact. It has been a stumbling-block not only to lawyers but also to the President in these cases, and I am very grateful to the Lords Justices personally as representing the Council, because they have facilitated our work very materially. They have practically laid down the dictum which seems to be borne out every time one comes in contact with lawyers, that whether you sell morphine mixed with treacle or dissolved in water, or in any other way, you are not selling in law a preparation of morphine, but you are selling morphine. From the point of view of this Council it is a dictum which is extremely convenient. Of course it has other consequences; it has this important consequence that in the schedule where the word "preparation" does not now appear all those of us who are registered must bear in mind that we are within the meshes of the Act if we do not attach a proper label to a mixture of particular substance (which has not the word preparation after it) with other ingredients. I know there are some of my friends who think that where the word "preparation" does not appear after a poison named in the schedule that they are not selling a poison when they are selling a mixture. I am bound to tell them that from a lawyer's point of view that seems to be wrong, and that when we sell a mixture of a substance which has not the word "preparation" after it in the schedule we must be prepared to regard it as a poison. To take an illustration. I am not sure—I am speaking from memory—but with regard to the word "corrosive sublimate" I do not think the word preparation follows. But wherever the word preparation does not appear in the schedule it nevertheless is the

fact that if we sell what we as druggists call a preparation of that poison we are selling poison, and therefore we must conform to the law. I do not know whether I have made myself plain—we are selling, as the solicitor reminds me, the poison. If we put the thing into the bottle we are selling the poison, so that it practically does come to this, that the word preparation, which is constantly used in both schedules, appears for all legal purposes to be absolutely valueless, and is, in fact, mere surplusage. The other case to which I refer is matter of considerable moment, and it is mentioned in the report somewhat at length. It has reference to a case in Scotland. In Scotland, as you know, or, at all events, in one particular part—Glasgow and the west—there are a number of open shops kept by medical men; and I have had to report to you before that we have thought it our duty, from time to time, to put the law into force with regard to the sale of poisons by unregistered persons in charge of shops of doctors in Glasgow and elsewhere. Now, we had often been told, both privately and publicly, that the medical man could do what he liked—that he could employ anybody to sell or dispense poisons—that he was outside our Act entirely; and that, in fact, the medical man could do all those things which the law in the case of Wheeler has laid down we cannot do ourselves. I think it is satisfactory to find that decision being challenged in the north, and the first decision having been appealed, it was ultimately confirmed by the Court of Appeal in Scotland, and it has been determined once and for all time, in law, that whether a man or woman be the servant of a medical man or of a registered chemist and druggist, that person cannot sell poisons except under the direct supervision of either the medical man or the chemist and druggist. I think you will see, gentlemen, if the interpretation had been the other way, what a serious matter it would have been for every registered chemist and druggist. If it had been held that the servant of the medical man, unqualified and unregistered, could sell and dispense poison, we should have had, I think, the greatest inroad upon our business, and we should have had greater dangers imported in the sale and dispensing of poisons than can be imagined. I know this is not a popular subject with my hearers. I know that many of us do not like this question of poisons, and it is just because we do not like it that I think it is the duty of the President to talk to you about it. It is not a pleasant thing, but we must really face all these things. As a Council we have to carry out this Act, and it is our interest, I believe, as individuals, that we should carry it out loyally, everyone of us. Whether it be in regard to labelling, or whether it be in regard to the direct sale of poison without supervision, and so on, I think it is desirable that we should, each of us, feel the responsibility which rests upon us. It is a responsibility which not only rests upon the individual himself, but it is a reflection upon the body politic if any of us do not conform to the provisions of the Act, and it might be used in future Parliaments as a reason for not giving us additional privileges in connection with the sale and dispensing of medicines.

WEIGHTS AND MEASURES.

Now with regard to weights and measures. There is a paragraph in the report on this subject, which I only refer to now because it so happens that I was summoned yesterday to give evidence before the Committee, and the reports that are given of such evidence are, of course, generally very brief, and it is very right and proper I should say substantially what took place yesterday. The Committee appears disposed to con-

sider the propriety of recommending that the metric system of weights and measures should be introduced universally throughout the Kingdom in every form, and some of the Committee evidently believe that such a change should be brought about by Parliament, and that it should be compulsory. But they also realise the difficulty of the problem. I am happy to say that the evidence I had to give, in answer to questions put to me, brought about the consideration which I think we may hope will turn out satisfactory, that, in the event of the Committee not seeing its way to recommend the compulsory change in the system of weights and measures throughout the Kingdom, meanwhile it is desirable that the permissive use of the metric system should be legalised. I pointed out that in pharmacy it was essential that we should use these weights and measures. I pointed out also, with regard to the Pharmacopœia, that in future editions of the Pharmacopœia the metric system is almost a necessity. I do not mean to say that it shall displace entirely the existing system, but that it may be put side by side with it; and I asked the Committee, as representing one class of the community, that we should be allowed to use the metric system of weights and measures in our shops and warehouses. That is practically all we want. I venture to go further, and say we were intelligent enough to be able to appreciate them without any compulsory Act of Parliament. There was a certain amount of novelty in that suggestion which affected the committee very materially, and they seemed to think that possibly other trades might follow the example of chemists and druggists if they got permissive powers. I have given evidence, therefore, to the effect that it is desirable that the metric system of weights and measures should be legalised in this country. You know that many years ago it was lawful, but when, somewhere about 1870 or 1873, there was a Consolidation Act passed, it was made penal for any person who kept an open shop or any place of business which was in the nature of an open shop, to keep any weight which was not according to the standards laid down. I pointed out to the Committee, as showing how careful Parliament is of the community, that we were allowed at the present moment to use the apothecaries' weight. I pointed out that we had two ounces of different weights, by which we were allowed to sell drugs; that we had two drachms—a drachm which represented the old apothecaries' weight, spelled "drachm," and a dram which weighs about half as much. A large part of this evidence was conversational, and probably will not be reported; but the general sense of my evidence was to suggest that in the next Pharmacopœia, or any Pharmacopœia, the metric system of weights and measures should be introduced, not to the exclusion of all others—that is no part of our business; that rests with the Medical Council—but I have ventured to suggest that the Medical Council, or anybody having charge of the National Pharmacopœia, practically must be allowed to include in such an important volume the metric system. Of course, most of you know that for practical purposes what we desire with regard to the metric system is that we should be able to make a preparation. The question of dosage, of prescribing, and all the rest of it, is a matter of education; but there can be no doubt whatever that the facilities which the system gives in the preparation of medicines, as exemplified in the United States Pharmacopœia, are immense. I believe firmly that mistakes would be fewer in every respect under the metric system than they are under our own very confused system.

LOSSES OF THE SOCIETY BY DEATH.

Then, gentlemen, we have to note the loss of one or two distinguished men, Flückiger, Bommer, and Ferrein, of Moscow, who were hon. members and corresponding members respectively. Flückiger, as you know, was the companion and fellow-worker of Hanbury, and was for many years an active correspondent of the Journal and of members of the Society. Perhaps one of the most pleasant things that has occurred recently in connection with the death of one of our corresponding members is the fact that the widow of Mr. Ferrein, of Moscow (who was only made a corresponding member last year, and died a few months ago), wrote saying how much she appreciated the honour done to her husband, what gratification he felt at being a corresponding member, and desiring to become a subscriber to the Benevolent Fund as long as she lived. I do not know whether many of my hearers have been to Moscow, but this particular pharmacy is a historic house, and one of considerable importance and dignity. Then we have lost, as you know, a number of founders—Edwd. Horner, J. Beech, Wm. Hooper, and Wm. Darling. We have also lost our old friend Mr. Savage, formerly a member of Council. I used to consider him an elderly person when I first came on the scene about thirty years ago, and it is most remarkable to find that he lived until so recently. We have also lost a certain number of local and divisional secretaries. The number of founders, of course, is diminishing, as it must naturally be, but I am glad to know that there is one more at all events than the number I referred to the other day at the Council, for I understand that there are a certain number of associate founders who became members in after years whose pedigree, if one may use the expression, was not always kept in the archives of the Society. I say that just as a sort of apology if there happen to be a greater number of founders living than I referred to the other day. I know of one, and probably that gentleman is present, and may refer to it. There may be other members in the Society who joined as associates and became members many years afterwards, the fact of which is not always known to us. If any of those associate founders will communicate with the Secretary we shall be glad to place their names on the list, which I venture to think will become more and more honourable the smaller it becomes. The resolution I have to propose is, "That the report of the Council be received and adopted."

The VICE-PRESIDENT: The President has dealt with the items in the report so fully that it would be foolish on my part to attempt to enlarge further upon them. I will content myself by simply seconding the motion.

Mr. BUTT: Mr. President and gentlemen, we have listened with a great deal of pleasure to the manner in which the President has amplified the report which has been put before us. No man is more capable to deal with matters pharmaceutical than our worthy President; as he just reminded us it was some thirty years ago since he first came upon the scene. In the early days when I was a member of the Council, in those stern times which existed about the time of the passing of the Pharmacy Act, Mr. Carteighe got initiated into the work of the Society under that admirable past president our late friend Mr. Geo. Webb Sandford. On the passing of the Act Mr. Carteighe retired from his position as a member of Council, and was elected as an examiner, and it fell to a great extent on his shoulders to organise the system of examination which has been carried on by this Society ever since the passing of the Act. After some ten or twelve years as an examiner he retired from the Board of Examiners, and was elected a member of the Council,

and for the last thirteen or fourteen years he has been President of the Society. During those thirty years there is no man who has done more to advance pharmacy than the President. No man has given up more of his own time to the interests of others; there is no man who has ever been connected with the Pharmaceutical Society who has been more intimately connected with pharmaceutical politics than Mr. Carteighe. Even our founder, the late Jacob Bell, has not done half so much for pharmacy as Mr. Carteighe, and I am quite certain that all of you gentlemen will give your best thanks to Mr. Carteighe, our President, for the services he has rendered to this Society.

I now propose to proceed to another subject, and with your permission will refer to one of *Æsop's* fables, called "The Mountain in Labour." The gist of this fable is in its application. Persons of all kinds who raise the expectations of mankind, and then by their mean performances betray and disappoint them, have time out of mind been lashed by the recital of this fable. I now propose to deal with some facts in connection with the Research Laboratory, to which the preceding fable seems to me a fitting prelude, and I propose in my remarks to divide the subject into two parts.

First, I propose to point out the object with which the Research Laboratory was established, and next to show you how much of the work that that laboratory was established for has been done. In doing that I cannot do better than read several extracts from the Council meetings as reported in the *Pharmaceutical Journal*, principally from speeches made by our worthy President. At the Council meeting which was held in July ten years ago, the question of systematic pharmaceutical research was introduced to the Council by the President, and in the course of the remarks he made he said: "The Society had for a number of years promoted education, and had indirectly promoted systematic research." "There was a large field of research in connection with the effects of solvents on drugs." "The effect of different solvents on the commonest drugs had been very little investigated." Again, "the best way of dealing pharmaceutically with a new remedy was an important question." Again, "it had often been held that to keep a Pharmacopœia abreast of the day it was essential that the work should be done continuously. The moment a new Pharmacopœia appeared it should be the duty of a permanent committee to consider it, and see how far its processes answered, what was intended, how far they could be improved, and how far in some cases they could be eradicated." "They might be content the first year with organising a system of efficient workers at a comparatively small expense, directed by a competent person filled with sufficient enthusiasm for the work, and rendering themselves useful, not only to the members of the Society and the trade, but also to the public at large. If such a project could be carried out with spirit the Pharmaceutical Society might in the future be referred to on all matters connected with the analysis and impurities of drugs. He did not mean that they should undertake ordinary analysis of drugs, but the work under the superintendence of this Committee would produce an effect on the public which would be of extreme value, and the improvement effected in pharmaceutical processes must produce an effect on the medical profession and on the Medical Council which could not fail to be beneficial."

If this were done "the general result would be that after ten years the amount of weapons which would be necessary in the shape of drugs and preparations

for the cure of disease would probably be materially reduced to nothing, whilst the potency, applicability, and value of those remaining would be proportionately increased. In the case of new preparations, their value would be discovered, and to what extent they were of value, and thus the compilers of the National Pharmacopœia would have an amount of material placed at their command which they could not afford to neglect." After a long discussion the following resolution was passed:—"That the Library, Museum, and Laboratory Committee be instructed to consider and report by what means, if any, systematic research in pharmacy can be promoted by the Society, and report to the Council."

In December, 1885, six months afterwards, the Committee reported to the Council that the question of the encouragement of systematic research in pharmacy had also been considered. The President, in moving the adoption of the report, said the investigations to be carried out in the laboratory must consist of two parts, first, research pure and simple in the natural history, chemistry, and pharmacy of drugs now sold, in a complete research on the aconites or belladonna, as well as the complete investigation of new drugs which had acquired a certain amount of reputation, but which had not been scientifically investigated; and secondly, there should be a means of verifying and practically testing the various formulæ of the British and other pharmacopœias. This was just an outline of the way in which such a laboratory would be useful. He would remind the Council that there was no authoritative decision as to what citrate and iron and quinine was, and other matters of the same kind, which I will not enter into. The result of that was that the report and recommendations were referred back to the Committee for further consideration. In March, 1886, the President, in moving that the report and recommendations be received and adopted, said "he had on a former occasion pointed out some of the advantages which he thought would accrue from such a laboratory, amongst others that there would be an opportunity of repeating, from the point of view of pure pharmacy and chemistry, experiments having for their object, amongst other things, the improvement of the formulæ of the British Pharmacopœia." Mr. Hampson said that the money of the Society could scarcely be spent for a better object if a commensurate result could be assured, but he was not satisfied that that would be the result. If pharmacists had the preparation of the Pharmacopœia once more in their hands then they might begin work at once; but the Society had not as yet received recognition by the Medical Council or the Government in dealing with the Pharmacopœia. Perhaps starting this laboratory might be a means to that end, and if so he should be very glad to support it. Mr. Schacht said "It occurred to him there was scarcely sufficient said about publication; there was a limit as to what should not be published, but there was scarcely a sufficiently strong declaration that all the work of the laboratory should be published." The motion was then again referred back to the Committee.

Mr. MACKENZIE: Cannot you summarise this? We have all read these reports at the time, and it is tedious to hear them read again.

Mr. BUTT: I will not be very long. In January, 1888, the final resolutions were adopted, and Mr. Cross said "he remembered perfectly well the annual meeting at which Mr. Giles brought forward this matter, and one of the arguments he used was the extreme benefit which would accrue to the practice of pharmacy from the standardising of preparations. Since then that ground had been partially removed,

because in the Pharmacopœia some of the more active preparations had been standardised; but the conclusion remained that whenever a research laboratory was thought of, it was necessary to be thoroughly assured that the research conducted there should be distinctly pharmaceutical. There were other bodies from whom they could get valuable biological, chemical, botanical and other facts, which might be deeply interesting to them; but as pharmacists, in their own laboratory, they should take care to spend their money in their own business." The President reminded the Council that this subject had been under consideration between two and three years. "The intention of the resolution was to work on the lines of the scheme which Mr. Cross preferred." This was the resolution "that the sum of £300 a year be granted for the next three years to a committee to be appointed annually, and that arrangements be made which will enable advanced students and others to undertake pharmaceutical research." A scheme was drafted as to the lines on which research was to be carried out. Pharmaceutical research should be directed to promoting scientific pharmacy, and would naturally comprehend the following duties:—The revision of all existing pharmaceutical preparations; and, conjointly with this—first, how far various preparations represent the drugs from which they are derived; what are the qualities of the drugs and the relative value of leaves, roots, seeds, etc., with many other matters of a similar kind.

I have given you now a short history of what the Research Laboratory was established for—pharmaceutical research. The resolution which was passed was a resolution to establish a laboratory for pharmaceutical research. I will now point out to you how much of that work has been done. In March, 1889, the Research Laboratory Committee reported to the Council, and they began by stating that the laboratory was established to undertake pharmaceutical research. Then in February, 1890, the Committee again reported on the same subject. In February, 1891, the Research Laboratory Committee reported to the Council, and gave a *résumé* of their work for the previous three years. Twenty papers were referred to in that report. Of those thirteen only emanated from the Research Laboratory, seven being obtained from other sources. Of these thirteen, eleven only were read at evening meetings, one before the Royal Society, and one before the Chemical Society.

In the first three years the Society voted £300 a year, and in addition to that, for a portion of the rates, rent, and taxes, water, gas, depreciation, and so on, you may easily add another £300 a year to the amount. We now come to the second period, the last four years, during which the Research Laboratory has ceased to be a pharmaceutical research laboratory, and become almost entirely a chemical research laboratory. The papers have not been read before this Society. The Pharmaceutical Research Laboratory publishes such very eminently scientific papers that they are not fit for the ears of ordinary pharmacists. They have to take them to some other place where a more appreciative audience can estimate their value. Out of a total of twenty-five papers in the last four years, there have been very few reported in the Journal. Thirteen were referring to aconitine; five, I think, have had reference to purely chemical subjects, and I understand have been paid for by a grant from the Chemical Society. I do not think the Research Laboratory was established to do the Chemical Society's work; it may be I do not know. The Director of your Research Laboratory is not a worker, and we cannot afford to keep an ornamental individual with the title

of Director of the Research Laboratory who does nothing but misdirect. What we want is a person who has a knowledge of pharmacy, who knows what the requirements of pharmacy are, and who has sufficient chemical knowledge and sufficient enthusiasm for his work to conduct our Research Laboratory on the lines on which we have always supposed it would be conducted. We want a man who has not fifty other engagements, or even twenty, but a man who will devote his time to the work for which he is paid. At first these papers were read at the evening meetings. Subsequently for the last four years they have been all read before the Chemical Society, as I mentioned before. If the work which has been done in the Research Laboratory of the Pharmaceutical Society had been pharmaceutical research, the proper place to have read those papers, and to have commented on them would have been in this room. The circulation of the Journal of the Pharmaceutical Society is considerably larger than that of the *Journal of the Chemical Society*, and not only that, but the work done here and for which we are paying would have gone to those who would benefit by it.

The work which has been done during the last seven years has been of no value whatever to the Pharmaceutical Society, with one or two very trifling exceptions. The Research Laboratory, has been carried on during the last three or four years at very considerable expense. The money expended at the present time directly and indirectly is not less than £1000 a year. Now, if the Director of the Research Laboratory had thought proper to fit out an expedition to the North Pole and had discovered that very interesting object and brought back a full account of the fauna and flora of that interesting region, no doubt they would have obtained a very great amount of *kudos*, but I should have said, and I think you will all agree with me, that the money of the Pharmaceutical Society had been appropriated to purposes for which it was not intended. The way in which the money has been appropriated for the last four years has been equally a misappropriation. No doubt a certain amount of *kudos* has been received, and I do not mean to say a word, or very little, against the work which has been done, but it has been done in a wrong direction; it has not been pharmaceutical research, but chemical research pure and simple. And I urge on the new Council most strongly to take the very first opportunity to remove the present Director of the Research Laboratory from the post which he holds, and replace him by a person more competent and capable of doing the work for which that laboratory was established. The President said, when it was proposed that the Research Laboratory should be established, that in ten years we should accumulate a sufficient amount of facts so that the Medical Council could not afford to ignore us. How many facts had we accumulated in the last seven years? Not one, and if we go on as we are going on, when the next pharmacopœia is published, whether it be in seven, or ten, or twenty years' time, we shall not have accumulated one more fact than at present, and the editors of the pharmacopœia will not derive one atom more benefit from the work of the Research Laboratory in the future than they have in the past. Therefore, I say you must remove your Director, and replace him by a person more competent to do the work.

There is one other matter which I am sorry to have to refer to, the question of the reliability of the work which has been done in the laboratory. I have very great doubt whether the work which is done there is altogether reliable. I believe it is done in a more or less careless, slipshod, perfunctory manner—that the Director himself knows little about the

work which is done, but is dependent entirely on what he is told by those who work under him. I will give you one or two instances. With regard to the papers on piperovatine and pelletorine. I had great difficulty in finding out what they were. I at last succeeded in seeing an abstract; and, instead of giving definite results, the Professor reported—"Piperovatine appears to possess an alkaloidal character." We do not want to know what anything "appears" to possess; we want some definite conclusion. With regard to pelletorine, he says—"Most of its chemical and physical properties closely resemble piperovatine, but so far it has always exhibited certain small differences, which may possibly disappear when the substance has been further purified." Why waste time, gentlemen, and allow your Director to waste time on research on impure substances? Purify your substances first before you commence your research, and then probably you will come to some definite conclusion. But if you are dealing with an impure substance, how can you arrive at any definite conclusion? Anyone can work on impure substances; it does not want a research laboratory for that. We want from a laboratory such as that of this Society definite results.

Another question taken up is that of aconitine. Thirteen papers were read on aconitine, and the work done, as I believe, has to a considerable extent been paid for by the Royal Society. Groves worked at that many years ago; Mr. Williams, our late President, worked on it; Wright and Luff worked on it; Dunstan has worked on it. And what is the result? Have you discovered one single thing in the whole history of the research which is of the very slightest benefit to the medical profession or to the dispensing chemist. You may have, from a scientific point of view, discovered certain facts which may be very interesting. Cast those aside. Let those researches be reserved for bodies like the Chemical Society or the Royal Society, if they choose to establish research laboratories of their own. It is not work of ours; we cannot afford to waste four years of our time in investigating one substance, and then arrive at no conclusion except a controversy. I was speaking just now about the reliability of the work. In the report for 1892, there is this very distinct and definite statement:—"Napelline or isaconitine possesses the same chemical composition as isaconitine, and furnishes the same hydrolytic products." Does it? Either that statement is wrong, or else a statement that has been published recently is wrong. They do not agree. We are distinctly told now that aconitine, when hydrolysed, loses acetyl and what was known as isaconitine is formed, which is an entirely different product.

Into this aconitine controversy I will not enter; it is very much too long and very much too difficult a subject for us to understand. Whether Professor Wyndham Dunstan has stolen Freund and Beck's thunder, or whether they have stolen his, is more than I can tell, but of one thing I am absolutely certain, and that is that Professor Dunstan wrote to the Chemical Society of Berlin in February of last year, claiming priority of the discovery that the constitution of aconitine was acetyl-benzoyl-aconine, and the so-called isaconitine was benzoyl-aconine. He said this had already been published by him, and when he stated that, he stated what was to say the very least incorrect, for at that time nothing definite had been published by him. The first publication I know about of Professor Dunstan's as to the absolute composition of aconitine was when he read a paper at an evening meeting in this room on March 14, 1894; that paper is published in the Journal of the 19th, and that was

the very first publication in print which emanated from him, wherein he stated definitely that aconitine was acetyl-benzoyl-aconine, and yielded one molecular proportion or 9.27 per cent. of acetic acid on hydrolysis, changing into "isaconitine." Freund and Beck, however, were the first to apply the term acetyl-benzoyl-aconine to the constitution of aconitine.

I have now done with the Research Laboratory, and I have a few words to say with regard to the Professor of Chemistry. Some ten or eleven years ago, when the late Professor Redwood intimated his intention to resign his post as Professor of Chemistry, a Committee was appointed to select a suitable person as his successor, and I perfectly well recollect at that meeting the President said, "What we want is an active, energetic young man who has a good knowledge of chemistry, who has had some training in teaching, and who, when he has arrived at a certain stage, should be passed on, and then we will get another young man of the same kind in his place." He was not to do private work on the premises of the Society, as had been done by his predecessor, and I think the whole of the Committee agreed with the President. Subsequently Professor Dunstan, or Mr. Dunstan, as he then was, was appointed. At that time Mr. Dunstan was an active, enterprising young man who had had a certain amount of experience in teaching and a considerable knowledge of chemistry. At that time he had his left hand on the ladder of fame, and the Pharmaceutical Society appointed him Professor of Chemistry, and lifted him up the first step. Soon after he was appointed Director of the Research Laboratory, and that enabled him to get up the second step. Since then he has been climbing up the golden stairs at a very rapid rate. Some time ago the Council thought fit to appoint professors as examiners. Professor Dunstan was not appointed examiner simply because it was utterly impossible for him to be in three places at one time. Sir Boyle Roche said you could not be in two places at once, unless you were a bird. Professor Dunstan is that typical bird. He manages to be in two places at one time, or if he cannot manage to be in two places at one time he does not hesitate to take the fees for being in two places at one time. Professor Dunstan is supposed to be at St. Thomas's Hospital at 11.30 to deliver a lecture on Monday. At 9.30 he is supposed to be at Bloomsbury Square, and again at 2.30 at St. Thomas's. On Wednesday he accomplishes the extraordinary feat of being at St. Thomas's Hospital and at Bloomsbury Square both at the same time, delivering two lectures at 9.30. On Thursday he is giving extra lectures I see at Bloomsbury Square at 9.30, at St. Thomas's at 2, and he is engaged in giving practical work there from 3 to 4.30. On Fridays he is at St. Thomas's at 10.30 and again at 2; on Saturday at 10.30.

In addition to these little duties he is an examiner on the Conjoint Board, he is an examiner of the Institute of Chemistry, an examiner of the London University, and in addition to that he is honorary secretary to the Chemical Society and honorary scientific adviser on drugs to the Imperial Institute. That is a pretty good list of offices—how much time is there left out of that for the Research Laboratory? He has climbed the ladder very high, and we were told at the time when he had reached a certain stage he should be passed on. The time has now arrived when you should pass him on, and the sooner you pass him on the better. At the last Council meeting—I am going to trouble you with only a very few words more—someone was enquiring about the expense of the Research Laboratory, and particularly with reference to a grant from the Chemical Society, the President said: "With regard

to the special chemical paper, a grant was made to Professor Dunstan by the Chemical Society, and he asked the Committee whether they would like the name of the Research Laboratory used in connection with it, and it was thought desirable that it should be so connected; otherwise Professor Dunstan would have carried out the investigation himself." He has no time whatever to carry out investigations on behalf of the Chemical Society, excepting in our Research Laboratory, and at the expense of this Society. I want this Research Laboratory conducted on proper lines where we shall do our own work for our own selves, not the work of other societies for other people. Last year it was my intention to have brought this subject before the meeting, but on speaking to two or three of my friends I was deterred from doing so. I was deterred on the ground that it was not fitting to wash pharmaceutical dirty linen in public. But there has been so much pharmaceutical dirty linen washed of late, and hanging in rags and tatters on the line, that nothing I can say can add anything to the laundry bill. I thank you for having listened to me so patiently.

Mr. MACKENZIE said he had attended during the last twenty-three years a number of the annual meetings, but he had never attended one that had been led off in the way the present one had been, or where the members had been entertained in the way they had been on the present occasion. The first speaker began by eulogising the President, but ended very differently, in fact, he (Mr. Mackenzie) thought they ought not to have listened so long as they did to an attack on a man who was not present to defend himself. When a gentleman was not present to reply to an attack, it was not honourable conduct on the part of any one to attack him in the way which had been done. Leaving this subject, he should like to say a few words upon the report, and in doing so would touch upon what had been said, though he would not occupy the time of the meeting at any great length. As one of those who had stated on many occasions hard things against the Council, he was present that day to state how much he appreciated their worth. The Council had realised that if they did well for Scotland they would do well for themselves. He would not say that the Council had cast bread upon the water, but he would say that they would reap a rich harvest before long. He was very glad to think that the examinations were now being conducted on good lines, and he was sure they had nothing to be ashamed of in Scotland, and he hoped the time would come when they would react, so as to be a great benefit for the future of the Society. He could only assure the members that those in Scotland appreciated what had been done for them by their friends in London. He hoped the Council would never lose sight, in any bills which they might be promoting, of the fact that only those who were upon the Register ought to reap benefit from trading. This was the axe which lay at the root of the whole tree. In his opinion they were clutching at straws while letting whole bundles of sticks go by. At the present time stores and limited companies were doing what only qualified persons should be allowed to do. Not long ago there was a talk of the great advantage of clumping trees, and he fancied this idea must have taken hold of the members of the Council drawing up the balance-sheet, for many of the items were so clumped together that it was impossible to understand them. With regard to the Research Laboratory, he thought as business men they were not prepared to spend a large amount of money without obtaining some result. He had every confidence in those who established

that Research Laboratory, believing their aim was right in the beginning and that they intended well, and he felt sure the time would come when the result of the labours of the Committee would turn out valuable and be applicable to things of daily life. If humble things were dealt with he believed great results would be obtained.

Mr. CAMPBELL: If I am in order I should like to ask a question on the section of the Report which refers to the Pharmacy Bill. I should like to ask the Council, although it has been described to-day as being in a "moribund" condition, to give us some idea as to whether the outgoing Council has thought over anything in connection with legislation during the forthcoming Session of Parliament. It is well known to those who have anything to do with Parliamentary Committees in their own towns or corporations that in order to secure attention to a bill it must be deposited by the latter part of the year. Of course legislation is out of the question in the present Session of Parliament, that we quite understand, but at the same time I should like to know that the present Council have not lost sight of the necessity probably for legislation, and assuming they believe that further legislation is necessary, and I assume they do believe that inasmuch as a draft bill was submitted to us at our last annual meeting, upon which no further action was taken; but assuming they are of opinion that that draft bill should be continued and supplemented, as many chemists in various parts of the country think, although the bill was good so far as it went, still it might be considerably supplemented. In such event it might be necessary to consider the question forthwith, in order that a draft bill might be submitted at the end of this year, which would be considered in Parliament next year. If that be so, would the Council of the Pharmaceutical Society be prepared to take the members thereof into their confidence previous to submitting the bill, because there are very many important questions that are vexing the pharmaceutical mind throughout the length and breadth of the country and with which the draft bill submitted to us last year did not probably deal? I believe that bill dealt to a large extent with the formation and the reorganisation of the Society, or the Council of the Society more particularly, but there are other matters upon which legislation is believed to be necessary. Legislation with regard to the Council of the Society is probably necessary in order to secure the representation of all classes of the members thereof upon the Council of the Society, because at the present moment the more numerous body of members are practically not in a position to be directly represented, and I believe that alteration was contemplated by the draft bill. But it is not only a question of the representation of the Society, but other matters, in order to secure that position which the Pharmaceutical Society should attain in the country generally; it should be made far-reaching, and I think that in any effort for legislation we should be able to say that we represent the entire trade. Then perhaps we could go to Parliament, knock at the door of Parliament, and that door may be opened to us. At the present time it may be that the Society, although considered a representative Society still, is not sufficiently inclusive. We want in any future legislation to make the Society inclusive of the whole of the trade at large. That opens up the large question of the question of preparation (and we have heard so much this morning of the Research Laboratory) for the trade itself with regard to higher examinations. That opens up a very wide question. And the question is being asked from one end of the country to the other—When

you have secured this higher education, and assuming that every future entrant to the Society becomes fully qualified in every examination and obtains the Major certificate, what is to be done with him then? At present a gentleman with a Major certificate has very little protection indeed, and in view of existing company trading he is no better off than the grocer or the stationer who sells drugs, or the gentleman who is a capitalist and invests his money, although he may be a cabinet maker or in some ordinary business entirely disconnected with pharmacy, and though he can put his money into a concern, and by that means amass a considerable fortune for himself and those who think fit to join him to the eventual utter ruin and annihilation of the members of the craft. It is not for me to foreshadow in what way you, or those who are associated with you—because you will be called upon to take part in future legislation with regard to the Society—or to dictate to you as to what course you shall adopt; but there is a great and general outcry on behalf of pharmacists throughout the country at the present time on account of the utter absence or protection for them after they have gone through this long, tedious, and expensive course of training. They do demand that in any future legislation they should have the same protection as is afforded to members of other learned professions. We know perfectly well that the members of the Incorporated Law Society have nothing to fear from outsiders; and the members of the medical profession, who after all obtain their degree and other qualifications at no greater outlay or expense in proportion than the members of our own profession, because it is a question of degree after all, are protected; and we ask that in future legislation the chemist should be protected. At the present time, after the Major qualification is obtained, what is the position of the holder in many of our districts? A young man goes down, takes a business, where he is perhaps allowed to sell oil, colours, paint, and many other things quite outside pharmacy, for the very reason that he has not an opportunity of doing much else; he is overshadowed by the great stores conducted by utterly irresponsible persons who are outside the pale of the trade itself, and who just bring themselves within by having some one in the stores who has the necessary qualification. Of course there is one thing that is to be asked of those who lend themselves to that position, who sell themselves to that position—to those who have obtained the Major or Minor certificates I would ask this question: In so doing and in furthering as they have done the store question—because the drug department of the stores could not possibly be carried on under existing circumstances unless a qualified person were there—from what they are now sowing what do they intend to reap in the future? They are sowing undoubtedly for the destruction of the ordinary retail trade. The question is whether they will reap for themselves in their latter days that advantage which they may hope for. They have a present prospect, in lending themselves to these stores, of shorter hours and of slightly augmented salary, as compared with what they would obtain at the hands of the retail chemist—but what are they doing for the future? I would urge upon qualified men the necessity of considering their position before they accept any of the situations thus offered by the stores. The question is a very large one and, of course, in any legislation we shall never get what we want, for legislation is, after all, only a means to the end, and to obtain the end we all desire we should endeavour to secure unity throughout our whole body. With that unity we may be able to obtain what we require at the hands of Parliament. We may then be able to administer it in such a way

as to place us in the position of other professional bodies, and to the satisfaction perhaps of the community at large. After all we do not claim to be protectionists in every sense of the word, but we do claim that our members, especially as they have to undergo a special training, should have the assistance of Parliament in this matter, in order that we may retain our position of responsibility, and not be overdone by those who are quite outside the profession, and who have no qualification whatever. I am quite sure that the Council in any future action will not lose sight of this view of the question, which I hope before we close the proceedings to-day will be spoken to by others in more fitting language than I have been able to use.

Mr. TAPLIN: I have only a few words to say, but, in the first place, I wish to point out, as Mr. MacKenzie has already done, that the pecuniary benefit derived from the sale of drugs should not be received by anybody but those persons who are upon the register. The medical profession is protected to a large extent, although when I stated this before you objected to my so doing.

The PRESIDENT: There is no protection in the medical profession in law. It is no use beating about that bush.

Mr. TAPLIN: All the training which people have to undergo in order to qualify themselves to trade as chemists and druggists is utterly useless unless you give us some protection. All over the country shops are selling things which ought only to be sold by chemists and druggists. So long as an outsider can put his money into a concern and sell articles which really should only be sold by chemists and druggists, I consider that it is no use whatever to put money into this Society.

Mr. LOMAS: I shall not trouble you with any observations about the Research Laboratory, because I think we have had quite enough of that already, but I do wish to say a few words to the Society as prosecutors. I remember, sir, some few years ago in an address which you delivered to the members you said the time would come when the Society would cease to be prosecutors under the Pharmacy Act. I do not know whether you remember that, but I do. I, for one, think the time is very near when the Society would do well to shift that responsibility on to a Government Department, and that the Society should cease to be prosecutors under the Pharmacy Act. What do you get by it? Nothing. But the loss is considerable. I have looked through the report which I have in my hand, and I fail to find anything about the expenses connected with the prosecutions that have been undertaken by the Society. But, anyhow, you may rest assured of this, that if there was a considerable sum to the good you would not be able to retain it, but would have to hand it over to the Government department. But it seems to me that if the amount has been on the wrong side, the loss you will have to bear. I fear that the valuable time given to these prosecutions could be far better utilised in strengthening the position of the Society, as your members have been telling us to do—to protect us against outsiders. You have a Parliamentary Committee—what have they to do? They have to look out for prosecutions which do no good to us. On the contrary, they do us harm in every possible way. Some time ago I stated that they might do good in this respect, that they would make the Society known, as it would be talked about by the public. But times have altered now. The only effect of instituting prosecutions is to raise up enemies; and if we leave these things alone, and let the Government undertake the prosecutions, we shall find that they will be far more active than you will in the matter. I think you said before that the Council

was fully occupied; and that being so, I would suggest that the Parliamentary Committee should cease prosecuting, and devote their attention to legislation to protect the members. You have Scotch members, they are long-headed; if Englishmen cannot do it, bring in Scotchmen and let them do something for the Society to protect the members. Get Members of Parliament to look after our interests in the House of Commons. It is in that way that you will be able to strengthen the position of the Society. I do not see any other way in which you can do it. I have often touched upon this subject; it has been neglected so long that I think it should be neglected no longer; and I hope the new blood that comes in will take this matter into consideration. Now just a few words upon the Library. Upon one occasion I went to the Library, and after groping about in darkness among the magazines I was able to get what I wanted. But when I got it I wished to make a few notes, and going to the table for that purpose I found that the tables were fully occupied by students. If that occurs very often I think you should provide more table accommodation in the Library, and a little more light where the magazines are. Upon a former occasion I said a few words about poisons, and what I say again is this—Take your stand upon this: no matter what the quantity, so long as the article contains a scheduled poison it comes within the Act. Never mind what the lawyers say—you know what they are—stick to all; get all you can, and if you cannot get all, get as much as you can.

Mr. ATKINS: It is some years, I think many years, since I spoke at an annual meeting, as we have an unwritten law amongst us that the representation of the Council at this meeting should be left in the hands of the President, and I think a very wise understanding it is; but I wish for one moment, and only for one moment, to depart from that practice to-day. I do feel it incumbent upon me to utter a very emphatic word with regard to the remarks made by my excellent and worthy friend Mr. Butt. What I want to say is this. I personally have all along very largely shared with him, and I know with others, the desire that the Research Laboratory should have a very much more direct pharmaceutical bearing that it has hitherto had. I quite believe with the different speakers that the area and department of practical medicine, the thing with which the ordinary rank and file of the business is concerned, is practically limited, and for the next hundred years or more if the Research Laboratory exists, it will find abundant material in pharmacy. But having said this, what I want to take upon myself to-day as a member of the Council is a share of the responsibility in the conduct of that Research Laboratory. I must confess that with very deep regret I have heard the somewhat personal attack made upon the President. Now, gentlemen, I have in days gone by in this room uttered very warm eulogies of the President, and I have said little of late, because I know he knows my heart and my esteem for him, but I do wish it to be placed on record to-day emphatically that it is my own conviction that we have in Mr. Carteighe a man who has devoted the splendid powers which God has given him, and for which he might be well thankful and we thankful, too, with no unstinted generosity to the work of this Society. I make this remark emphatically at this meeting, because a rumour is in the air, and it may have some substance, that this is the last year of Mr. Carteighe's presidency. I offer no opinion upon that point here. It is not for me to say whether it shall or shall not be, except if I am re-elected as an individual member of the Council. But for the first four years of his Presi-

dency I was his Vice-president, and I then knew the amount of work which he gave to this Society. Of course I am perfectly conscious that, as his Vice-president having a strongman as President, with strong judgment and a marvellous tenacious memory, my work was a very humble one, but I wish to say that during my four years of office, Mr. Carteighe gave an enormous amount of his time to the business of this Society, and I believe that the work since has largely grown. Do not let this, if it be the last year, for one moment be overshadowed by any sense of deprecation whatever. I do wish to have it most emphatically stated that our friend has served us to the very best of his light and ability. Just one more word, which I will touch with the lightest hand, because I speak of Mr. Butt as a valuable friend of mine whom I greatly esteem. I do deeply regret that he has touched in the closing part of his remarks upon a much vexed controversy. I think that the less we say here upon that matter the better. The Council did take wisely and properly an action with regard to that matter, and there the question I think may rest. It is not for me to attack the character or the ability—for both I consider have been attacked—of a man who occupies a distinguished position. I have always felt, in going through life, that when the character of a public man is attacked, if the attack is vindicated and justified that England is the poorer. It is a big word to utter. I say this emphatically, I have strong political convictions which I never express in ordinary assemblies. I do not care who is the leader, whether it be of one party or the other, but if I hear that man's character traduced, and he is represented as being not an honest or moral man, I say whoever makes the charge, and he can prove it, that England is the poorer. I say the character of every man upon the Council for honesty and integrity is the dearest thing we have. If you steal my purse you take trash, but if you take my good name from me you take God's greatest gift. I say let us hold our judgment in suspense. Great questions, purely technical and scientific, must come before tribunals competent to deal with them, and when the final Court of Appeal scientifically has pronounced its judgment upon integrity of work I shall bow most loyally to it. I have shadowed out my ideas. I came into this room with the absolute intention of not saying one word, but I do feel I must place on record my great regard and thankfulness for what Mr. Michael Carteighe has done for the Society, and my desire with regard to the much vexed question of a particular controversy that we should hold our judgment in suspense.

Mr. EXIN: I think with Mr. Atkins that the less said upon this matter the better; in fact, I almost wish that Mr. Butt's speech had been left severely alone. I do not like to question what you do in the chair, but I must confess that I was astounded that you let him go on for the length of time you did. It is impossible to enter into the controversy in this room. I am sure Mr. Butt must have done it unconsciously, but he has given an absolutely unfair and garbled account from beginning to end. This matter has been sat in judgment upon by several men who have given a considerable amount of time to the consideration of it, and the charge that has been brought against the Professor was proved to be absolutely untrue. I am sorry to hear it reiterated in this room. Mr. Butt makes unfair insinuations; he said you were seen coming out of the archway of Burlington House, and if that means anything it means, I suppose, that we had a committee meeting in the rooms of the Royal Society. All I can say is it is absolutely untrue. I suppose the inference was

that meeting there we should be more or less under the influence of Professor Dunstan. It was merely for the convenience of two of our members that we met in the rooms of the Royal Society, and Professor Dunstan was only there for a short time to answer our questions. Any attempt to show bias is absolutely out of place. I will say this of Professor Dunstan, that we are all aware that his engagements have considerably increased. The Council has had that under their consideration, the Research Laboratory has had it under theirs as to whether it would be possible for him to continue his work. But his work in the past has been thorough. One great thing which has not been mentioned is his enthusiasm in teaching the students. This is the first time in our history where there has been any possibility to teach students higher research. I am almost afraid to mention the word, because some gentlemen seem to think that we are doing too much, and so forth. As to the aconite research, that was started by our friend T. B. Groves. He carried it up to a point and said I can carry it no further, and the Research Committee are aware how it has grown and monopolised time; in fact, we have considered whether we should pull it up or not, though up to the present we felt that it must go on. It has given the appearance that the Research Committee has not been alive to more pharmaceutical requirements. The equipment of the laboratory with men who are now qualified to make proper and necessary investigation is considerable, and if we are to take an active part in the formation of the Pharmacopœia, I think the Research Laboratory will redound to the credit of the Society, and be of much help. I could not leave this meeting without saying something in favour of Professor Dunstan, who, I consider, has been attacked behind his back. It is only justice to him to say that, so far as the Research Committee is concerned, Professor Dunstan's labours have been worthy of all praise. Of course, the time may come—perhaps it is already come—when Professor Dunstan will have to elect what work he will carry on. We, as a Society, ought to be proud of a man who has raised himself to the position he has. It is no small thing to be the secretary of the Chemical Society. He is our own product, and instead of crying him down I think we ought to be proud of him.

Mr. GILES: The motion before the meeting is the adoption of the report and the accounts, and it would be extraordinary if no one asked a question on the accounts. Although I am perhaps the last person entitled to ask it, I think it is desirable that a question should be asked by this meeting. I have only had the accounts in my hand for a few minutes before the meeting; but they appear to show an excess of expenditure over income of between £1600 or £1700. That is not a material thing if it is exceptional, and will not occur again; if this is a thing which has to be accepted as the perpetual condition of things it is somewhat alarming; and I simply rose to call your attention to it that you might give some information which might be encouraging on that point.

Mr. MACKENZIE: I should like to ask whether it is competent for a person to make personal attacks upon anyone when he has not ended it with a motion? It is no part of the report which is before us, and if that is so I hope we shall not consider it. I think as to the questions with regard to aconite and the like, as they are not in the report, and have not even been followed by a motion, that they ought not to have been mentioned.

Mr. BUTT: It is in the report of the Research Laboratory Committee.

Mr. EWING: I should like to express on behalf of my friends in the northern part of the Kingdom our sincere thanks for the generosity of this Society. We have had provided by you, and by your Council, a set of rooms for examination purposes, and a hall which is a credit to the Society, and I have not the slightest doubt, as my friend Mr. Mackenzie said, it will go far to strengthen the hands of the Pharmaceutical Society in Scotland. Therefore, gentlemen, it is my duty and my pleasure to thank you all for your kindness and for your unstinted liberality. I do not wish to enter into this unfortunate and much vexed question of the Research Laboratory. Like Mr. Atkins I wish to withhold my judgment in the matter, if it is worth anything at all, but I should like to say that having been brought in contact during the last three years with your President, he has given me most unbounded support, most unvaried kindness, and if there is anything which grieves me at all with regard to this matter it is that at the time of his presidency ceasing (for I have heard a rumour that he is about to retire, though I hope it is not true) there should be this cloud hanging over him. I feel that to be a matter as to which deep sympathy should be offered to him. I trust that after his long and able services to the Society he will not end his career under such a cloud as at present appears to be over him. I can only say that I thank you all on behalf of the Executive of the North British Branch for your kindness to us.

The PRESIDENT: Gentlemen, I do not feel particularly under a cloud—and yet in a sense I am under a cloud, because people accept garbled statements of what has been going on in the Council chamber, which should be private, as being true representations of such statements. That is what I am suffering from; that is all. I am not going to refer further to the observations of Mr. Butt. It is very good of him to take the opportunity of pronouncing a funeral oration upon me. It is well timed; it is the proper time. Of course, I have been a great nuisance; that is not my fault, it is the fault of other people; but I know one thing, and that is that there is more than one officer of this Society who would be glad if Michael Carteighe retired from the presidential chair. Some officers do not like a strong President. I consider that that is possible, and in this particular instance I think it is quite time for me to make my bow.

When I say that I am obliged to Mr. Butt for giving me this funeral oration, I mean exactly what I say, neither more nor less. I shall ignore, as I think it is fit to do, everything he has said. He has made a number of statements which are incorrect to say the least of them; these statements refer to something which is not before us, something which is private and confidential, and forms part—I was going to say almost a quarrel—which is not before us, though if it were I should have something to say about it, and I think possibly there might be a difference of opinion as to whether several officers of this Society might not be talked to seriously. It is not fair for you in a meeting of this sort or for anyone to bring forward a statement of this kind. The general question may be raised fairly enough, but a personal question in a body where we cannot speak freely and which is in the hands of the Council, and it is unwise to bring forward. I hope Mr. Butt will not consider I am disrespectful to him. I know him very well; I know his power of occasionally saying things which he does not intend to wound, but which do wound; and I know that more than once we have felt how useful Mr. Butt would be upon the Council if it were not for his over-frankness perhaps, and his over-desire to state the naked truth in a somewhat brutal way. The reference that he has made to certain

gentlemen who are associated with the President and Vice-president in certain work is, I think, unfortunate. Whenever the Council asks men to join a committee for specific work, it ill becomes a person who has not the responsibility of a Councillor upon his shoulders to criticise the motives of a number of honourable men, and not only honourable, but distinguished men—men who are doing good to the Society by coming to its dinners or entering its portals—men who do good to the Society whenever they come in contact with the President. What do we want? We want to extend our power and usefulness, as has been said by several speakers to-day. Now, how is that to be done? Not by talking to each other. Some of us want to go to Parliament, and that is right enough. How do we want to make the work of the Society known? It is no use talking to ourselves in our Journal. You want to spread the news far and wide, and everything that is published from our Research Laboratory, which goes all over the world into the hands of people who are not pharmacists is, to put a vulgar phrase on it, a good advertisement for this Society, and it brings with it a respect which you cannot measure. It brings with it in many cases power. In my journey in the States, there was not a single professor of chemistry that I met who did not pay the highest compliment with regard to the work which has come out of the Research Laboratory. But I will let that pass.

Mr. Mackenzie has referred to company trading, and the clumping of expenditure, and so on, and so has my friend, Mr. Campkin. The Council has referred a number of things for early consideration to the Parliamentary Committee, which will no doubt be reappointed when the new Council meets. The question whether you should have a Bill, that is, a compound Bill, containing a number of things which should be submitted to the members before we go to Parliament, has not yet been decided upon. There are others who think the consolidation of the Society might be the best thing to do *per se*—I mean to say, consolidation such as we drafted a year or two ago, which would give the rights and privileges which are now not obtainable under the Act by associates in business—I say such a Bill as that would tend to consolidate the Society and encourage the great mass of the trade to come into our ranks. If we could do that we should have a great leverage to work with. I must admit that the difficulties surrounding this subject are very serious. There is a good deal of work which is done by the Council in Committee, which is done by your officers in connection with Government departments, which sometimes promises to give hope of getting some amelioration, and the Council, through the Presidents, have been acting during the last few months in more ways in connection with this grave subject. There is more than one way of attacking this kind of bogus company-trading—namely, the direct way and the indirect way, and both processes have been considered by the Council. The direct attack upon what most people would call ordinary company-trading is excessively difficult. With the immense amount of capital at command, anybody ready to lend money at a small rate of interest, it is no wonder that every kind of occupation should now be tackled by people who are capitalists. We suffer more in proportion because of the very smallness of our returns, but it is a serious matter for the nation as a whole. It is a big question—it is a question of national importance. I do believe that before long a department of Government will have to face this thing and will probably deal with it in some way which will be at least a

slight benefit to us and to every small tradesman. On the other side, if I were to give evidence before a Select Committee as to the injury done to chemists and druggists, I think the chairman would probably point to the number of candidates coming up every year, and he would ask me how it was that with this dreadful condition of business, the numbers who wanted to come into this craft, which we say is not worth coming into, is so great. I am bound to be frank with you. I have to carry to others the opinions which you utter in this room. I have to fight your battles before people who criticise everything I say, and I have to be on sound ground. With reference to the question of what is the good of the Act, I think we may congratulate ourselves upon the fact that whatever the defects of the 1868 Act, we certainly should have been worse off in the great struggle if there had been no Act at all. I feel certain if we have done nothing that the educated man has been able as a chemist and druggist in many cases to save himself from absolute ruin, to say the least of it, he has been able to exist. If the chemist and druggist had not been registered, the condition of the whole of their trade would have been worse than it is now. There is not much protection given in this country to any form of professional occupation. There is very little of that real protection, though there are certain indirect ways of getting protection just as there is in our case. We have the exclusive right in a sense to sell and dispense poisons. In an individual sense that is correct, but in another sense, that is in the case of a company trading, it is incorrect.

The only properly constituted professions that I know of in this country are those of the Bar and Solicitors. The solicitors have a perfect system of trading and examination and a proper set of restrictions governing their calling; but with that they are responsible to a big authority; they have to be on the rolls. They pay nine guineas every year to have their names properly kept on the register, and they are amenable to be brought before the Incorporated Law Society for any slight deviation from the strict duty. So are the Bar. Where does that come in with the chemists and druggists? If we run on the professional line or up the professional ladder we must be prepared to take the responsibility, and it is not everybody who will undertake to do that. We have not the power to strike a man off the Register for committing a serious offence. We are only part of the way on to a profession, and the question is whether, if we go the whole way, and desire to be so registered, whether we must not follow either a compulsory or voluntary code of ethics which many of our men are at present unable to bear. When I speak about medical men not being protected, I am quite aware that under the Apothecaries Act prosecutions may take place, but the power of prescribing or of doctoring is practically open to everyone except a chemist and druggist. We are referred to in the old Apothecaries Act. It is the chemist and druggist the prosecutors have gone for when they think he is prescribing, but as a matter of fact as long as a person does not use the title he can carry on the greater part of what is called medical practice. Theoretically he cannot sign a certificate of death legally, but I can put my finger upon a place in the North of England where a large number of certificates were signed by persons who were not registered, and the certificates were never questioned. We are badly off, and some of our medical friends are not much better. We who live, some of us by dispensing the prescriptions of the shining lights of the profession are apt to look upon them as being representative of the whole medical art, but I think there is almost as

much struggling in the medical profession, or if not there soon will be, as there is in our case. They are suffering from the effect of capital. Great bodies get men to do work for a small pay, and so the wheel goes round, and the personal increment is reduced year by year. Whether that is on the principle of good for the greatest number or not I do not know, but some say it is. Then Mr. Mackenzie referred to clumping. The fact is, we have a Committee to draw up the form of our accounts, and there is great inconvenience sometimes in giving details for the purpose of criticism. We do not object to criticism, but it would be impossible for your President to answer many of the questions put to him, if we gave many details in these accounts, without doing some damage to our own interest. I must appeal to you as men of business, for many of you, when you go to company meetings, know that the Directors always consider what they shall publish in the shape of accounts. I do not think that a Society like ours, at the annual meeting, need go into too much detail with regard to the accounts. You may criticise the total expenditure in a department, but there is a positive disadvantage about it, and we have thought it wiser with regard to the law and sundry other accounts, to put the balance on whichever side it is. We have thought it wiser with regard to the Journal to put the total on one side as against the total upon the other. We are not ashamed of our accounts in any way, but there are reasons why, when we are carrying on in some department a business, we do not care to disclose every little detail. It is not that we are afraid of criticism. I am afraid the custom of giving a statement of receipts and expenditure was begun in the early days of the Society when it was comparatively poor, when a question of £10 on one side or the other was a matter of moment. That custom grew up and we followed it, but I know of no other incorporated body which goes into so much detail in presenting the report as we do. With regard to the question put by Mr. Giles, I must refer him to the first paragraph of the report, where he will see we refer to the fact that we have paid £2000 out of revenue for the enlarged premises in Edinburgh. It is not the revenue for the year, but that which is just over. Out of the income of 1893 and 1894 combined we have paid £2000. We do not hope that that will go on. Our friends in Scotland will no doubt be at us before long, but we cannot afford to let them have many more thousands. There is some balance due to them at the present moment, and we hope to pay that out of revenue this year.

The resolution for the adoption of the report was then put and carried unanimously.

APPOINTMENT OF SCRUTINEERS.

The PRESIDENT then read a list of names of gentlemen who had been nominated to act as scrutineers, and their appointment was unanimously agreed to.

APPOINTMENT OF AUDITORS.

The following gentlemen were appointed to act as auditors:—

BUTT, EDWARD NORTHWAY, 77, Hamilton Terrace, N.

LESCHER, FRANK HARWOOD, 60, Bartholomew Close, E.C.

STACEY, SAMUEL LLOYD, 22, Great St. Helens, E.C.

UMNEY, CHARLES, 50, Southwark Street, S.E.

YATES, FRANCIS, 64, Park Street, Southwark, S.E.

The PRESIDENT then called attention to the fact that the following registers had been laid upon the table in compliance with the provisions of the Act:—

Register of Members, Associates, and Students of the Society.

Register of Pharmaceutical Chemists.

Register of Apprentices and Students under the Act of 1852.

Register of Chemists and Druggists under the Act of 1868.

The PRESIDENT: Gentlemen, I have now to move that the meeting adjourn until 3 o'clock to-morrow.

Mr. BUTT: Gentlemen, before we leave I think we ought to propose a vote of thanks to the President. I should like to say this much, that Mr. Carteghe is a personal friend of mine, and if I have said anything with regard to him which is outside the range of proper criticism, I much regret it.

The motion, having been seconded, was carried, and the meeting then adjourned.

ADJOURNED GENERAL MEETING,

Thursday, May 23.

MR. MICHAEL CARTEGHE, PRESIDENT, IN THE CHAIR.

The adjourned meeting for receiving the report of the Scrutineers was held on Thursday, May 23.

The Chairman of the Scrutineers, Mr. E. N. Butt, read the following report:—

SCRUTINEERS' REPORT.

We, the undersigned Scrutineers, appointed at the Fifty-fourth Annual General Meeting of the Pharmaceutical Society of Great Britain, do hereby certify that we have examined the voting papers committed to us, and report the following:—

Voting papers reported by the Secretary to have been issued	3800
Voting papers received	2049
Voting papers issued but not returned	1751
Voting papers received	2049
Voting papers disallowed:—	
Informal	20
Received by post too late	65
	85

Voting papers registered 1964

Result of the Poll.

Martindale	1749	Corder	1512
Carteighe	1734	Young	1504
Atkins	1672	Savory	1455
Hills	1661	Groce	1420
Bottle	1617	Harrison	1396
Newsholme	1596		
Allen	1593	Bateson	1177
Hampson	1591	Campkin	957
Southall	1559	Wills	645

EDWARD N. BUTT, *Chairman*.

W. K. HOPKIN.

ALBERT PELLEW.

R. F. YOUNG.

WM. FLETCHER GADD.

HERBERT CRACKNELL.

S. A. STURTON.

ROBT. H. JONES.

J. R. WRETT.

W. PRIOR ROBINSON.

JAS. SPILSBURY.

J. C. HYSLOP.

HENRY C. BIRCH

J. H. SHACKLOCK.

A. E. TANNER.

EDWARD B. STAMP.

D. R. JACKS.

P. J. ROBBINS.

F. BASCOMBE.

JOHN HOLDING.

JAMES H. GRADIDGE.

W. MURTON HOLMES.

P. DAVIDSON.

C. H. FARROW.

THE NEW COUNCIL.

The PRESIDENT, as Chairman, then declared that the following gentlemen would constitute the Council for the ensuing year:—

ALLEN, CHARLES BOWEN, 20, High Road, Kilburn, London, N.W.
 ATKINS, SAMUEL RALPH, Market Place, Salisbury.
 BOTTLE, ALEXANDER, 37, Townwall Street, Dover.
 CARTEIGHE, MICHAEL, 180, New Bond Street, London, W.
 CROSS, WILLIAM GOWEN, Mardol, Shrewsbury.
 CORDER, OCTAVIUS, 31, London Street, Norwich.
 GOSTLING, THOMAS PRESTON, Diss, Norfolk.
 GROSE, NICHOLAS MALE, 8, Temple Street, Swansea.
 HAMPSON, ROBERT, Knole Paddock, Sevenoaks.
 HARRISON, JOHN, 33, Bridge Street, Sunderland.
 HILLS, WALTER, 225, Oxford Street, London, W.
 JOHNSTON, JOHN, 45, Union Street, Aberdeen.
 MARTIN, NICHOLAS H., Northumberland Road, Newcastle-on-Tyne.
 MARTINDALE, WILLIAM, 10, New Cavendish St., London, W.
 NEWSHOLME, GEORGE THOMAS WILKINSON, 74, Market Place, Sheffield.
 SAVORY, ARTHUR LEDSAM, 143, New Bond Street, W.
 SCHACHT, GEORGE FREDERICK, 1, Windsor Terrace, Clifton, Bristol.
 SOUTHALL, ALFRED, 17, Bull Street, Birmingham.
 STORRAE, DAVID, 228, High Street, Kirkcaldy.
 WARREN, WILLIAM, 24, Russell Street, Covent Garden, London, W.C.
 YOUNG, JOHN RYMER, 42, Sankey St., Warrington.

The PRESIDENT next thanked the Scrutineers for their services, and, Mr. Butt having briefly responded, the latter gentleman was specially thanked for acting as Chairman of the Scrutineers, after which the meeting terminated.

Proceedings of Societies in London.

WESTERN CHEMISTS' ASSOCIATION
(OF LONDON).

At a meeting of the above Association, held on Wednesday, May 15, the President (Mr. R. H. Parker) in opening a discussion on "The Present Phase of the Poisons Law," drew attention to the serious anomalies existing in the law as recently interpreted; first, in the matter of labelling very dilute preparations "Poison" while carbolic acid is under no restriction; secondly, in the matter of selling poisons, a competent assistant of six or eight years' experience not being legally allowed to sell a packet of oxalic acid without supervision; and lastly, in the matter of keeping open shops, for while a pharmacist is subject to all the pains and penalties of the Pharmacy Act, a limited company is declared to be outside the operation of the Act, and consequently free from many of its restrictions. The law, therefore, harasses the qualified chemist and gives outsiders a loose rein. Mr. Parker pointed out that the existence of these anomalies was not the fault of the Pharmaceutical Council, nor was the remedy at present in their hands.

The fault lay in the blind rigidity of legal interpretations, and the remedy consisted in the united demand by chemists for a rational construction or amendment of the Pharmacy Act. Clearly trade protection pure and simple, and the prohibition of com-

pany pharmacies which are under the management of a qualified chemist, were neither necessary nor possible at present. The fundamental principles of an effective Pharmacy Act might be included under two headings; (1), The public must be protected from the untrained and incompetent medicine vendor; and (2), The trained and competent pharmacist must be protected from unfair competition. These desiderata might be secured by the following regulations:—Every shop or place open to the public for the sale of articles enumerated in the poisons schedules, or for the dispensing of medical prescriptions, should be registered, together with the name of its *bond-fide* manager and of its owner or owners. The manager must be a qualified chemist, and must give his whole time and attention to one pharmacy, must be held responsible for the proper conduct of that pharmacy, and may have his managership certificate (his Minor diploma) suspended or cancelled for gross inattention or misconduct. Any pecuniary penalties incurred should be borne by the manager, or, in default, by the owner or owners. An assistant's qualification (which may be a portion of the Minor) should permit dispensing of prescriptions and sale of scheduled poisons in a registered pharmacy during temporary absence of the manager, the latter being responsible for the assistant's conduct. All poisonous and dangerous substances should be scheduled for sale in registered pharmacies only. The phrase and "its preparations" to appear in Part II. only. The use of the "poison label" for articles in Part II. to be left to the discretion of the manager.

The following resolution was submitted to the meeting. "That this meeting, while supporting the policy of the Pharmaceutical Council in its administration of the Pharmacy Act under recent interpretation, is of opinion that future legislation should be directed towards the conjoint registration of every pharmacy with the names of its qualified manager and its owner or owners, the manager to be held responsible for its proper conduct, and, together with the owners, for any pecuniary penalties that may be incurred. That the qualifying examination should be divided to admit of an assistant's qualification, and that the matter of labelling poisonous substances should be largely left to the discretion of the manager of the pharmacy."

Mr. Andrews agreed with most of Mr. Parker's suggestions, and referred to the existing impossibility of supplying every chemist with a qualified assistant.

Mr. Taplow thought that a clear rule for labelling poisons should be established, leaving no doubt as to the chemist's procedure.

Mr. Marsh considered it very desirable to insist upon the principle of a separate manager for each shop, and that the manager's name should appear on all labels.

Mr. Hyslop said that there were a great many good points in the present Pharmacy Act, and he thought it would be better to amend it rather than commence *de novo*. He suggested a section of the "Poisons Schedule" for sale in licensed places other than pharmacies, but Mr. Marsh pointed out that such would form a dangerous precedent.

Mr. Gulliver drew attention to the difficulty that would be involved in supplying outlying districts with preparations sold only in registered pharmacies.

Mr. Andrews said that the proposition before the meeting was a most important one, requiring careful consideration and an extended expression of opinion, he therefore proposed that the discussion be continued later; this having been seconded and carried *nem. con.*, the meeting adjourned until June 19.

Notes and News.

REVISION OF THE BRITISH PHARMACOPOEIA.—The *British Medical Journal* announces that nearly 5000 answers have so far been received to the circular (*ante*, p. 1018) recently sent out by the Therapeutic Committee to members of the British Medical Association in reference to the revision of the B. P.

DENTAL HOSPITAL OF LONDON.—The thirty-seventh report of the governors of this institution shows that the probable cost of the site and building for the new hospital will be £40,000, of which £14,000 is yet required, and friends of the hospital are asked to assist in covering this amount.

PRACTICAL BOTANY.—Summer schools for the practical study of botany are conducted in the United States, and *Nature* announces that several will be held this season—those in connection with Cornell University and the University of Wisconsin from July 8 to August 16, and that in connection with the Cambridge Botanical Supply Company for five weeks, beginning July 5. Home universities might well make a note of the fact and do likewise.

THE ISOLATION OF ARGON.—Attempts by H. Moissan to produce argon compounds with rare elements which unite with nitrogen have failed completely—titanium, boron, lithium, uranium, and fluorine all yielding negative results.

PRACTICAL PHOTOGRAPHY.—The London Technical Education Board is said to be contemplating the establishment of a school of practical photography, mainly for the purpose of training workmen in the production of process blocks, half-tone work, photolithography, collotype, photogravure, and other substitutes for wood engraving now largely used by the illustrated press. Most of the skilled workers at these processes are foreigners, and the Board is anxious to establish a school that may be able to exert an immediate and direct effect on an important industry and to benefit a large class of skilled workers.

DR. THORNE THORNE AND THE MEDICAL COUNCIL.—Dr. Richard Thorne Thorne, C.B., F.R.S., the principal medical officer of the Local Government Board, who succeeds Sir John Simon as a member of the General Council of Medical Education and Registration, was born at Leamington in 1841, and educated at Mill Hill Grammar School, at the Lycée St. Louis, Paris, and at St. Bartholomew's Hospital. He took his M.B. degree at London University in 1866, and qualified as a F.R.C.P. in 1875.

BEQUEST BY PROFESSOR FLÜCKIGER.—The late Professor Flückiger has bequeathed to the Imperial University and National Library in Strasburg such of the scientific works in his private library as that institution may desire. Such a gift will be a welcome addition to the Library, and commemorate in a fitting manner the name of the donor.

CHEMICAL LECTURE CHARTS.—Messrs. Sampson Low, Marston and Co. have issued a series of chemical lecture charts, consisting of twenty-five sheets, each 40 inches by 30 inches. They are intended to supplement the use of apparatus, those details of chemical manipulation being figured which it is either impossible or very difficult to perform in the lecture-room, of which the isolation of fluorine, the liquefaction of oxygen, nitrogen, etc., and the electrolytic preparation of aluminium may be mentioned as examples. A large number of the figures depict such manufacturing processes as are necessary to be understood by all students of chemistry; for example, the manufacture of nitric acid, sulphuric acid, hydrochloric acid, boracic acid, etc., on a commercial scale; also the smelting of iron, the Bessemer process, Pattinson's process, the extraction of sulphur, distillation of iodine, extraction of phosphorus, and others.

BRITISH ASSOCIATION.—The British Association meets at Ipswich on September 11 next, under the presidency of Sir Douglas Galton. The list of presidents of sections is as follows:—Section A (mathematical and physical science), Professor W. M. Hicks, of Firth College, Sheffield; B (chemistry), Professor R. Meldola, of the City and Guilds Technical College; C (geology), Mr. W. Whitaker, of the Geological Survey; D (zoology, including animal physiology), Professor W. A. Herdman, of Liverpool University College; E (geography), Mr. H. J. Mackinder, reader at Oxford; F (economic science and statistics), Mr. L. L. Price, bursar of Oriel College, Oxford; G (mechanical science), Professor L. F. Vernon Harcourt, of University College, London; H (anthropology), Professor W. M. Flinders Petrie, of University College, London; K (botany), Mr. W. T. Thiselton-Dyer, director of the Royal Botanic Gardens, Kew. The two evening discourses will be given by Professor Silvanus Thompson, on "Magnetism in Rotation," and by Professor Percy F. Frankland, on "The Work of Pasteur and its Various Developments." There will be, as usual, two soirées, and also excursions to places of interest in the neighbourhood of Ipswich.

ACETYLENE AS AN ILLUMINANT.—The value of acetylene as an illuminant has been tested in the photo-chemical laboratory in Charlottenburg. The extremely high price of the gas (a cubic metre costing 50 marks), and its inferiority to coal gas when used in an incandescent burner, indicated its unsuitability for general illumination purposes, but most serious of all is the fact that after it had been kept for two days in a gasometer its illuminating power had almost entirely disappeared.

CONVERSAZIONE AT ST. BARTHOLOMEW'S HOSPITAL.—On the occasion of the centenary of the Abernethian Society, a conversazione was held at St. Bartholomew's Hospital, and particular interest attached to the lantern demonstration by Dr. A. A. Kanthack, of photomicrographs of bacteria. Dr. Kanthack is Lecturer on Pathology to the Hospital, and chief of the Pathological Laboratory, and although quite a young man, has already achieved a European reputation as a bacteriologist.

HEROIC REMEDIES FOR INFLUENZA.—A "certain" cure for *la grippe* has been discovered by a Lieut.-Colonel and Master of Gymnastics, residing at Gefle, Sweden. In the first case experimented upon—that of a stout man—he administered a mixture of one teaspoonful each of spirit of camphor and rectified turpentine, followed immediately by two aloes pills. The next day the patient "returned completely recovered, and remained so," having perspired freely and slept well. The experimenter next treated all the members of his family and other persons afflicted with influenza, "all of them with the same absolutely good effect." The aloes pills, he observes, are to be given in the presence of headache only.

SALE OF DIPHTHERIA ANTITOXIN IN ZURICH.—The Board of Health in Zurich has issued the following instructions with regard to the sale of diphtheria antitoxin serum:—The sale of the serum is limited to the public pharmacies of the canton; it is to be included among the powerful drugs, and to be sold only when prescribed by a registered physician. The serum must be obtained from one of three stated factories, the name of which, together with the date of filling and other details, must appear on each label. It is also to be kept in a cool place, and not sold unless free from permanent cloudiness or from any considerable deposit.

NEWSPAPER ACCURACY.—In the report of the Annual Dinner of the Pharmaceutical Society, published in the *Daily News* of Wednesday last, there occurs an amusing mistake, Sir Richard Quain being described as the President of the Board of Trade. This slip is all the more remarkable since the *Daily News* is generally understood to be the organ of the present Government, and, as such, should be exceptionally acquainted with the various office-holders.

CONFERENCE BLUE LIST.—The list of subjects for papers, annually published in connection with the British Pharmaceutical Conference, is now being issued. Some new subjects have been added to the list published in the Journal last June, and the attention of those proposing to contribute papers this year is called to the fact that the Bournemouth meeting will commence on Tuesday, July 30, so that papers should be in the hands of the Executive Committee as early as possible in July.

PROCEEDINGS UNDER THE PHARMACY ACTS.—At the Bloomsbury County Court on Thursday, John S. Armitage, dentist, etc., 1, Colva Street, Dartmouth Park Hill, N., was proceeded against for penalties under the Pharmacy Act for keeping open shop and selling chlorodyne and Powell's balsam, he not being a registered chemist and druggist. Mrs. Lavinia Hill, of 91, Lower Marsh, Lambeth, was similarly proceeded against for keeping open shop and selling Powell's balsam, and J. A. Hogg, 45, Walworth Road, S.E., for selling Hogg's rodentium vermin killer, containing a very large proportion of arsenic. A report of the proceedings will appear in next week's Journal.

Parliamentary News.

ROYAL COMMISSION ON TUBERCULOSIS.

In the House of Commons, on Thursday, May 16, Mr. Shaw-Lefevre, in reply to Mr. Knowles and Mr. Field, said the Royal Commission on Tuberculosis made no recommendations in their Report. The Commissioners had arrived at various conclusions of fact as to the existence of tuberculosis in animals, and as to the possibility of its being communicated to consumers of meat and milk. These conclusions appeared to point to the expediency of an extension of the system of inspections of dairies, slaughter-houses, and butchers' shops, and possibly to the general establishment of public slaughter-houses. Until the evidence taken by the Commission had been published, and time had been given for the consideration of the very large and difficult questions involved, he would be quite unable to state the intentions of the Government on these matters, or whether it was desirable to have a further inquiry.

FOOD AND DRUGS ACT—"DRUGS."

On Wednesday, May 22, Mr. Charles Umney, of Wright, Layman and Umney, of Southwark, gave evidence before the Select Committee of the House of Commons in reference to the revision of the Sale of Food and Drugs Acts, 1875-1879, more especially as regards drugs.

The Committee now taking evidence sat during most of last Session with Sir W. Foster, F.R.C.P., as Chairman. On Wednesday, when Mr. Umney gave his evidence, Sir Charles Cameron, Bart., M.P., was in the chair. So far, therefore, as the Medical Profession Analysts, and the Drug Trade are concerned, all are singularly fortunate in having as members of their committee, gentlemen who not only are authorities on medicine, but who are also chemical experts.

Mr. Umney, in speaking as a wholesale druggist and manufacturing chemist with thirty years' practical experience, stated that twenty years since there was a necessity for passing the Sale of Food and Drugs Act, and in his opinion the practical effect of the Act had been that the standard of drugs had in consequence of the Act been raised so that the drugs supplied in Great Britain to-day might be equalled, but certainly were not to be surpassed, by the drug supply of any country in the world.

He thought that the authorities under the Act had proceeded with great moderation, and the much abused analysts had, as a body, done their work with an accuracy that was to be commended.

Public analysts had, in his opinion, much difficulty in carrying out their share of the provisions of the Act, for they had to contend with the ugly fact that the British Pharmacopoeia was not by Statute constituted the legal authority for standards in drugs.

Analysts were unfortunately sometimes asked to advise authorities upon the desirability of prosecutions being taken under the Act, and as a consequence occasional errors had been made.

As chemical assayers, their opinions were, of course, reliable, but on drugs their knowledge was superficial, and consequently misleading when they acted as experts.

Analysts had still another difficulty, viz., the persistence of the public in its demand for household medicines, compounded or prepared from some antiquated formula, notwithstanding the British Pharmacopoeia may have contained a similar preparation.

Less friction would certainly have arisen if analysts had looked for, and reported to the authorities upon, medicinal purity rather than for absolute chemical

purity, and had this been done some of the proceedings instituted in certain districts against sometimes as many as twenty or more persons on one occasion, would not have been taken, and the public would not have regarded the working of the Act as a piece of petty tyranny on retail traders.

Mr. Umney did not spare the drug brokers, who, he stated, sometimes offered a spurious drug, under the name of the drug which it most nearly resembled or for which it was hoped to substitute it. Such sales, he thought, should be as amenable to the law as those of the wholesale or retail druggist.

Then followed various suggestions for embodiment into a revised Food and Drugs Act.

Standards for Drugs.—A revised Act should state definitely that the standard of strength adopted by the British (or Imperial) Pharmacopœia for the time being, would be the legal standard for all purposes of the Act, and that when any substances used in medicine were not described in the current Pharmacopœia, then the standard mentioned in that particular Pharmacopœia in which such drug appeared, whether it be a former edition of the British Pharmacopœia, or editions of the London, Edinburgh, or Dublin pharmacopœias, should be adopted.

In cases where the drug did not appear in any of such previous pharmacopœias but in those of France, Germany, or United States of America, etc., etc., Mr. Umney recommended that the standard of those pharmacopœias should be accepted, and in the absence of a standard for such drugs in any of the pharmacopœias referred to, then the standard should be fixed by a committee, to the constitution of which he referred later on.

As to the warranty of drugs, Mr. Umney thought it would be convenient if drugs were divided into two classes:—

(a) Drugs that did not decompose or alter in respect to their medicinal property upon keeping. For these he recommended that a warranty of not less than six months and not more than twelve months might be given by the wholesale druggist and accepted by the purchaser.

(b) Drugs that decomposed or changed upon keeping, so that their medicinal efficacy was impaired, he thought should be sold under a warranty not exceeding one month.

As to the actual form of the warranty, Mr. Umney suggested that this might be given in one or two forms, or even both of the following forms:—

(a) Either by a printed or written label affixed to each bottle, jar, parcel, or package thus:—
"Warranted in conformity to the characters and tests of the British Pharmacopœia."

(b) Or the invoice in which the purchaser is debited with the goods might be the actual warranty.

Mr. Umney thought that there should be a more complete definition of the word "Drugs" than appeared in the old Act, so that when substances which were used for food, or in the arts, or for household purposes, found places in the Pharmacopœia, and were used for medicinal purposes, there should not be that wrangling which oftentimes characterised proceedings under the Act as to whether the substance was a drug or not. He laid special stress on the desirability of constituting a council or committee of advice (or reference), as by it, and by it only, he was of opinion, in cases of dispute, pharmacists would, under all circumstances, be treated with fairness and justice. His view is that an authority so constituted under the Act should consist of nominees of the General Medical Council, the Inland Revenue authorities, Somerset House, the Institute of Chemis-

try, the Pharmaceutical Society of Great Britain, and the London Chamber of Commerce.

The opinions and advice that such a committee would give could not fail to be invaluable to authorities under the Act, whether prior to proceedings being taken or on a case of reference prior to a final judgment.

Mr. Umney also stated that as a member of the committee recently appointed by the Pharmaceutical Society to aid the Medical Council in constructing a new Pharmacopœia, he should not fail to urge upon his *confrères* on that Committee, in the compilation of a new edition of the British (or Imperial) Pharmacopœia, the absolute necessity of framing such characters and tests for chemicals, galenical preparations, essential oils, etc., so that a new edition would be a comprehensive one for legal standards.

Mr. Umney finally made a suggestion that it might be found convenient to work the Act of Parliament, in so far as drugs were concerned, as a sub-section of the Act. He thought that if it were so worked it would be freed from much of the complicated and cumbersome machinery of the entire Act.

FORMULÆ FOR OINTMENTS WITH ADEPS LANÆ.

COOLING OINTMENT.

Adeps lanæ, 20 parts; rose water or lime water, 30 to 45 parts; benzoin in fine powder or oxide of zinc, 10 parts.

FIRM PASTE FOR ECZEMA.

Oxide of zinc, 6 parts; precipitated sulphur, 4 parts; white fuller's earth, 2 parts; adeps lanæ and benzoin, of each 14 parts.

SOFT PASTE FOR ECZEMA.

Oxide of zinc, French chalk, of each 2 parts; olive oil and lime water, of each 6 parts; adeps lanæ, 4 parts; tincture of benzoin, 1 part.

OINTMENT FOR CHILBLAINS.

Camphor, 3 parts; balsam of Peru, 1 part; oil of sweet almonds, 16 parts; adeps lanæ and rose water, of each 20 parts.

COLD CREAM.

Borax, 2 parts; liquid neutral soap, 1 part; adeps lanæ, 20 parts; rose water, 180 parts; tincture of benzoin, 1 part.

OINTMENT FOR PSORIASIS.

Oil of caldec, 10 parts; adeps lanæ, 20 parts; zinc ointment, 30 parts; solution of chromated lime, 40 parts.

MERCURIAL OINTMENT WITH ADEPS LANÆ.

Mercury, 20 parts; adeps lanæ, 25 parts; benzoin in powder, 15 parts; oil of bergamot, 1 part.

UNCTUOUS INJECTION FOR CHRONIC URETHRITIS.

Silver nitrate, $\frac{1}{2}$ to 2½ parts; oil of sweet almonds, 10 parts; adeps lanæ, 40 parts; distilled water, q.s. (*Méd. Moderne*, Feb., 1895).

Notes in Brief.

DISTILLED WATER from which all gases had been set free, protected by covering it with oil, has been frozen by Prompt without any dilation of the volume originally taken.

ARSENIC OR MERCURY may be made into pills says Lang *Mon. f. Bakt. Derm.*, by employing a mass consisting of milk sugar, 2 or 3 parts, and lanolin, 1 part.

IRON NITROSO-COMPOUNDS, forming a new series, have been discovered by K. A. Hofman, and O. F. Wiede, and constitutes interesting examples of the synthetic production of complex inorganic substances.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

AN INTERESTING ELECTROLYTIC PHENOMENON.—The *Electrician* records that at a recent meeting of the Franklin Institute, Mr. C. J. Reed described a curious electrolytic phenomenon observed by him. Most metals, when used as positive electrodes in electrolysis, are, he remarked, either dissolved or corroded, producing metallic salts or oxides; but when used as negative electrodes, metals do not generally undergo such corrosion. While experimenting, however, on the oxidising effect of various electrolytes upon lead electrodes, Mr. Reed noticed, accidentally, that under certain circumstances, lead behaved towards some electrolytes in a peculiar manner, the only conditions required being very high electromotive force and current density. On passing an electric current through a solution of disodium-hydrogen phosphate, between electrodes of sheet lead, nothing unusual was noticed during the experiment. The solution had a very high resistance, and very little current passed even with a high electromotive force. At the close of the experiment, there being no switch in the circuit, the current was interrupted by lifting one of the electrodes out of the solution. It happened to be the negative electrode. At the instant of final contact between the electrolyte and the lowest point of the electrode, as it left the solution, what appeared to be a cloud of black smoke, or precipitate, which had suddenly formed in the solution, was noticed. On examining the cloud more particularly, and repeating the experiment several times, it was found that by exposing only a very small surface of the negative electrode to the solution, there was produced a large cloud of dark blue or lead-coloured precipitate, which rapidly sank in the solution and rendered it entirely opaque. It was then observed that the lead cathode was being rapidly eaten away, and that the precipitate was being produced at the expense of the lead. The precipitate was collected on a filter, washed with water and alcohol, and dried. It was found to be an impalpable powder resembling lead, and permanent in the air at ordinary temperatures. When rubbed in an agate mortar, it was reduced to a lustreless gummy mass, but did not assume a metallic appearance. Heated to the melting point of lead in the open air, it suddenly absorbed oxygen and formed yellow plumbic oxide with incandescence. Heated in a glass tube in absence of oxygen, it melted to a globule of metallic lead. The surface of the lead cathode, after the experiment, was reduced to a point at the end, and presented a smooth, shiny surface, like polished lead. It was of the form one would expect to find a positive electrode of copper or other soluble metal. Other electrolytes were tried, and it was found that the lead precipitate could be produced in them.

ROYAL INSTITUTION.—On the occasion of Professor Dewar's final lecture on "The Liquefaction of Gases," on May 16, the experiments, according to the *Daily Chronicle*, were in the main a repetition of those given on previous occasions to illustrate the potent effects of liquid oxygen as a cooling agent in scientific research where the behaviour of matter at very low temperatures is under examination. There were, however, one or two new points touched upon. It is found that, although chemical action ceases at the boiling-point of oxygen, yet if a sufficient local heat can only

be kept up at any point in the fluid it is possible to maintain combustion there. In such a case, clearly, the combustion must be taking place in a kind of vesicle or sac of liberated gas, the burning substance being out of contact with the liquid oxygen, and therefore at a much higher temperature. Professor Dewar performed the experiment of plunging a burning jet of hydrogen gas right beneath the surface of a jar of liquid oxygen, and showed that the flame continued to burn fiercely, although surrounded on all sides by this inconceivably cold fluid. A large quantity of ozone was liberated during the process. In demonstrating the enormous increase of electrical conductivity obtained by cooling metals down to minus 180° C., he pointed out the vast economy in electrical distribution which could be effected if it were only possible to keep our electrical cables at this low temperature. Another interesting experiment proved the extreme transparency of liquid oxygen to radiant heat. A lens-shaped globe was filled with the liquid, and the rays of the electric light being condensed through this vessel, it was shown that a piece of tinder could be rapidly ignited at their focus. It will be remembered that in Tyndall's famous experiment, where water was the liquid employed under like circumstances, the water almost completely filtered out the rays of radiant heat. Professor Dewar concluded a series of brilliant and highly successful experiments by freezing a soap bubble in the heavy layer of oxygen gas which lies floating on the surface of the liquid oxygen. The bubble when frozen presented the exact appearance of a decapitated egg-shell. In the future, the lecturer remarked, there remained a vast deal of work to be done, and doubtless they would be able to reach temperatures lower still. The very lowest temperature possible, he pointed out, was minus 274° C., the "absolute zero" of the physicist, which was probably the normal temperature of interplanetary space.

TECHNICAL EDUCATION AND TRADES UNIONS.—A conference between some leaders in Technical Education and some officers of trade organisations was recently held at Watford, when the Chairman, Professor Atfield, F.R.S., said the question to be discussed was that of the practicability of establishing a Technical College for Watford and West Herts. Technical classes already existed in connection with the public library at Watford; the question was whether or not those classes could be extended and developed into something like a separate college occupying a separate building. Two classes of persons were represented at this meeting—the public generally, and artisans in particular. It would be well to hear the views of any member of either class. Eight weeks previously he had ventured to ask the arts and crafts men and women of Watford what they would do with technical education, assuming they had got it. What would they do with young workmen whom a technical college has classified into good, better, and best? Would the trades unions come in and reduce them once more to a dull dead level of uniformity, all the men to work only equal numbers of hours per day, and do equal amounts of work, and earn equal amounts of money? For answer he had been told that the limit of the best workman to the output of the worst, and the consequent general degradation of the general capacity to the lowest level, though true years ago, is true no longer, the trades unions now demanding high-pressure work for good wages, the slower workman too often having no work at all. With regard to the new unionism, no one could be expected to vote for a rate in aid of technical classes or to give ten pounds or a hundred towards a technical college whose students would be likely to be adherents of the socialist new unionism. A man or

woman who has saved money, little or much, could scarcely be expected to practise such a suicidal mode of giving as that. He was much too great a believer in the common sense of British artisans to imagine that they would long be misled by nation-killing dogmas, but there must be some guarantee that outside "new unionists" should gain no entrance to any Hertfordshire technical college. In the discussion which ensued, the trades union leaders repudiated ulterior socialistic objects, at all events so far as Watford and West Herts were concerned, and undertook to hold some meetings amongst themselves in the hope of devising a mode of removing the barrier to the progress of technical education that had presented itself.

CHEMISTS' CO-OPERATION.—It is with much satisfaction that we hail the official announcement that the allotment letters in the Chemists' Co-operative Society were posted last week. It is not a very definite announcement, and somewhat tardy, seeing that it comes after a private reminder from ourselves, and so very long after the closing of the lists. The lists were closed eighteen days ago, and the subscriptions must indeed have been numerous and complicated to render so much delay necessary. Yesterday a complaint came to hand from one who said he was a subscriber to the Society, who appealed to us apparently because of the adverse criticism which we were compelled to make upon the prospectus when it recently appeared. The subscription lists, he said, were closed more than a fortnight ago, and no allotment had been made. He applied for a hundred shares, and as the delay in allotment struck him as ominous, he had twice written to the directors, demanding the refund of the amount which accompanied his application. To the first demand the secretary replied that the matter would be placed before the directors; to the second demand no reply has been vouchsafed. "Meanwhile," he wailed, "the society are no doubt enjoying the interest on our application money." We trust the complaint was unfounded, and there appears to be a mistake somewhere, for on our private application to the company they assured us that everything was in order, and asked us to refer complainants to them, which we have done. And they now issue the official announcement as to the posting of the allotment letters last week. Whether or not the complaint is unfounded—and of course we ought to hear more of the matter—the lesson remains that there should not be this delay on the part of new companies in issuing allotment letters. —*Pall Mall Gazette*.

A CAMPHOR FAMINE.—The news that the price of camphor was advancing at the rate of a penny or two per pound every day, as the result of the recent war between China and Japan, and that England and the Continent were threatened with something like a camphor famine, has caused considerable alarm. That this should be so is not surprising, seeing that camphor is an article of daily consumption, used as a medicine in diseases from the most fatal form of Asiatic cholera to a mere cold in the head. Its value as a disinfectant is thoroughly established. Beyond this, its use has helped to check the spread of Asiatic cholera. It has been tried in Naples by the famous Dr. Rubini, whose testimony to the merits of camphor as a cure of cholera has never been disputed. In the great cholera epidemic of 1854 he administered camphor, taken internally, to 400 cholera patients, every one of whom recovered. Proctor, during the cholera epidemic in Liverpool in 1826, treated 123 cholera patients with camphor, and there were but three cases of relapse. The drug has indeed even more beneficent properties than the general public are aware of. A large dealer in the drug says the present unprecedented demand

for it is due to the fact that more camphor has been sold for future delivery than is at the moment obtainable, and that the stock on hand does not exceed 4000 or 5000 cwt.

The greater portion of our camphor comes from China and Japan. Before the war it was cheap, but as soon as hostilities were begun the price went up. With the close of the war the manufacturers thought camphor had reached its top price and must recede, so they did not increase their stocks. But it turned out that they were wrong, and those who delayed buying had to pay a higher figure for camphor, the price of which, like that of everything else, is regulated by the relation of demand to supply. Camphor costs to-day from £7 to £8 per case of a hundredweight; but a few years ago the price touched £9, and at a former period even reached £20. There is no reason why the price should not advance beyond the very moderate figure it stands at now, which is not excessive compared with what it was in former years. Camphor is dearer in China to-day than in London, a case that costs £7 16s. here being sold in China for £9.

It would appear, therefore, that there is less camphor in England to-day than is necessary to meet the requirements of the manufacturers; and when the Continental buyers begin to purchase heavily, it is more than likely that camphor may fetch £12 or perhaps even £14 a case. A good deal of camphor is held by a syndicate, who, however, will, it is understood, sell to manufacturers at a moderate price sufficient camphor to carry on their business. But speculators who have sold camphor they did not have, and could not now obtain will suffer. Should a warm summer bring dysentery or cholera to England, the demand for the drug will be very great. Camphor has been nearly all obtained by the Chinese, who are greatly demoralised by the results of the war, or by the Japanese, whose Government have restricted the production by passing a law that the camphor trees shall not be cut down but only tapped. It will take the Chinese seven or eight months to prepare the new crop of camphor for the market, camphor-making from the gum being a very tedious process. The gum has to be washed and spread in the sun to dry, and undergo another treatment. Camphor-making is not a regularly organised industry, but a monopoly of certain tribes in China, some of whom are now in rebellion against the Government.—*St. James's Gazette*.

A CHEMIST CENSURED.—The coroner for the St. Clears district, on Saturday, May 11, severely commented on the conduct of a chemist named Morris William Jenkins, St. Clears, in supplying medicine for an old man named David Wilkins, whom he had not seen and without instructions from a medical man. The chemist supplied medicine for a bad cold, and the old man it was proved died from inflammation of the lungs.

ROYAL MICROSCOPICAL SOCIETY.—May 15. The President A. D. Michael, Esq., in the chair. Mr. J. Swift exhibited an improved form of the Nelson microscope lamp fitted with mechanical movements, and a "Wales" microscope, which had been fitted with the new mechanical stage. Mr. T. Comber read a paper on the development of the young larvæ of *Trachynois aspera*; the subject was illustrated with lantern photographs exhibited upon the screen. Miss Ethel Sargent's paper "On the first Nuclear Division in the Pollen Mother-Cells of *Lilium martagon*," etc. was communicated by Dr. D. H. Scott. A discussion ensued, in which Professor J. B. Farmer, Mr. Spencer Moore, and Dr. Scott took part.

Irish News.

EXHIBITION AT BELFAST.—In the Arts and Industrial Exhibition at present being held in Belfast, which will in all probability be continued to the end of October, there is, as might be expected, a very large display of aerated waters of all kinds. Almost all the leading manufacturers have fine stands of exhibits. But while this is the case, there is a wonderful absence of pharmaceutical displays. In a city in which there are so many chemists apparently doing good business, a more extensive show of attractive cases was only to be expected. This, however, is not so. The principal houses are not represented anywhere, and the general absence of this class of goods is a subject of remark. At present, in the commercial capital of Ireland matters are tranquil in this trade. There is nothing specially noteworthy to be recorded.

DEVELOPMENT OF IRISH HEALTH RESORTS.—Steps are being taken to render Ireland more attractive to tourists by supplying better accommodation than has formerly existed. Thus, a new hotel has been opened at Bundoran, near Ballyshannon, on Donegal Bay, by the Great Northern Railway of Ireland, and the County Down Railway authorities have begun the erection of a hotel at Newcastle, Co. Down. Hotels have also been erected at Larne, Ballycastle, Carrick, Gweedore, Rosapenna, Port Salen, and other places on the different Irish coasts.

CASES UNDER THE IRISH PHARMACY ACT.—On Monday, May 20, at Roscommon Petty Sessions, Mr. W. Lowden Browne presiding, Messrs. Daniel Walsh and Patrick Walsh, of Castle Street, Roscommon, appeared to answer three summonses at the suit of the Pharmaceutical Society of Ireland, the first of which charged them with having on March 1 last sold arsenic in a packet labelled "Cooper's sheep dipping powder" to the complainant, George A. Phillips, they not being properly qualified to do so; the second with keeping open shop for the retailing and dispensing of poisons without being qualified to do so; and the third with selling a poison not labelled in the manner required by Section 2 of the 33rd and 34th Victoria, the Poisons Act. Mr. James Jones, of Castle Street, in the same town, also appeared as the defendant in four summonses at the suit of the same Society, charging similar offences, the articles alleged to have been sold to the same complainant being "Biggs' sheep dipping composition" and "Cooper's sheep dipping powder."

Mr. John M. Whelan, solicitor, of Roscommon, prosecuted on the part of the Society. Professor Tichborne, one of the members of the Council of the Society, was in attendance.

Mr. Joseph Burke, solicitor, appeared for the defendants Walsh.

Mr. Whelan said he appeared for the Pharmaceutical Society of Ireland to prosecute in these cases which were brought under Section 30 of the Irish Pharmacy Act of 1875 and the Poisons Act.

Mr. George A. Phillips, the Inspector of the Pharmaceutical Society, was sworn, and Mr. Whelan was about examining him when Mr. Burke said he had a preliminary objection. It had been stated that these prosecutions were brought at the instance of the Pharmaceutical Society, but the complainant named in all the summonses was Mr. Phillips. Under Section 4 of the Act of 1875, the Pharmaceutical Society were made a corporate body capable of "suing and being sued." He submitted that the summonses should be dismissed.

After a considerable amount of argument, the Magistrate decided to adjourn the hearing of the summonses for not properly labelling poison until the next court day, and to dismiss without prejudice the other summonses.

Poisoning Cases and Inquests.

Belladonna and Aconite.—Annie Wittey, a schoolmistress, died at Alwalton, near Peterborough, from the effects of poison on Monday, May 6. Deceased was in the habit of taking sleeping draughts and of using liniment for her rheumatics, and the evidence at the inquest, held the same day, went to show that she accidentally drank a quantity of the liniment, which contained belladonna and aconite, in mistake for the sleeping mixture. Verdict: "Accidental death through poisoning."

Cyanide of Potassium.—Daniel Williams, aged 45, died at Low Spennymoor from the effects of cyanide of potassium, self-administered. At the inquest held on Friday, May 3, a verdict of "Suicide whilst insane" was returned.

Laudanum.—Richard George Tuckett, a journeyman baker, died on Thursday, May 9, at Islington, from the effects of laudanum, self-administered. Verdict: "Suicide whilst insane."

Oxalic Acid.—Hannah Featherstone, aged 46, died on Saturday, May 11, at Bishop Auckland, from the effects of oxalic acid, self-administered. Verdict: "Suicide."

Carbolic Acid.—Martha Alice Rafferty, aged 21, died on Sunday, May 12, at Elgin Avenue, Maid Vale, London, from the effects of carbolic acid, self-administered. Verdict: "Suicide while of unsound mind."

Oxalic Acid.—John Gerrard, aged 83, died on Wednesday May 15, in the Southport Cemetery, Southport, Lancashire, from the effects of oxalic acid, self-administered. Verdict: "Suicide while of unsound mind."

Strychnine and Arsenic.—Ann Sumner, aged 31, died on Friday, May 10, at 7, Pharos Road, Fleetwood, from the effects of strychnine and arsenic contained in a mouse poison, self-administered. Verdict: "Suicide whilst temporarily insane."

Vitriol.—Frederick Garner, aged 25, died on Wednesday, May 15, at Mansfield, from the effects of vitriol, self-administered. Verdict: "Deceased was of unsound mind at the time he committed the act."

Carbolic acid.—Sarah Graham, aged 25, died on Thursday, May 16, in the Rochdale Infirmary, Rochdale, from the effects of carbolic acid taken in mistake for tea. Verdict: "Accidental Death."

Oxalic acid.—Louisa Lawton, aged 26, died on Saturday, May 18, at Nesbit Street, Hulme, from the effects of oxalic acid, self-administered. Verdict: "Suicide whilst insane."

Carbolic acid.—Mary Shea, aged 22, died on Friday, May 17, at 13, James Henry Street, Oxford Street, Manchester, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst temporarily insane."

Country Notes.

THE POISONOUS PROPERTY OF THE SHREW MOUSE.

—Both in this country and in Germany popular tradition in rural districts attributes poisonous effects to the bite of the common shrew mouse. Scientific naturalists have discredited this belief, but the recent observations of Remy St. Loup, published in the *Revue des Sciences Naturelles*, tend to show that this popular reputation for toxicity may not be groundless. He observed that cats were afraid of the animal, and having captured a specimen placed it in a cage with a common mouse. The latter, although twice the size of the shrew, fled from its companion in fright, but nevertheless was bitten in the leg by its fellow prisoner. The bitten mouse speedily developed abnormal symptoms, and on releasing it, its hind-legs were found to be perfectly paralyzed. It was enveloped in cotton wool, but the next morning was found dead without having moved from where it was placed. Considering that the wound caused by the bite of the shrew was very small, it would appear that the old tradition as to the poisonous properties of its bite, at least as regards the domestic mouse, is well founded.

FINGER AND TOE DISEASE IN CRUCIFERES.—The peculiar disease causing thickening of the roots of crucifers with the formation of numerous hard nodules so that the root soon decays, has been investigated at Kew. The results obtained by previous workers are confirmed, the disease being caused by a specific organism called *Plasmodiophora brassicae*, which, however, does not limit its attacks to cultivated plants, but occurs also on many common cruciferous weeds such as charlock, garlic mustard, treacle mustard, and shepherd's purse. Hence it is necessary to prevent the growth of such weeds in fields and hedgebanks. The development of the organism is favoured by acids, but checked by the presence of alkalies, so that a dressing of lime, or of a manure containing potash salts, is effective, the last being most valuable, since it not only destroys the germs in the soil, but also arrests the disease in seedlings, and at the same time supplies a necessary ingredient for the healthy growth of turnips (*Proc. Roy. Soc.*, May, 1895).

APPLICATION FOR PREVENTION OF THE AMERICAN BLIGHT.—Seventy-five parts soft soap, 5 parts linseed oil, and 25 parts carbolic acid are mixed. Add 1500 parts of water to the mixture before using. Equally suitable is a mixture of 4 parts carbolic acid with 100 parts sodium silicate (*Zeitschrift*, xlix., 249).

GRAFTING WAX.—375 parts Burgundy pitch, 250 parts yellow wax, 100 parts Canada balsam, 75 parts olive oil or melted lard are melted together and then rolled out into sticks while soft. Or dissolve 5 parts of resin and 5 parts pitch, stir on the fire till liquid, remove and add gradually 1 part methylated spirit. Preserve in well-stoppered bottles (*Zeitschrift*, xlix., p. 249).

STICKY TRAP TO PREVENT CATERPILLARS REACHING FRUIT TREES.—Five hundred parts resin, 350 parts lard, and 350 to 500 parts of oil are melted together. Paste strips of brown paper round the tree and apply the hot varnish to these. This prevents the insects from climbing up the tree (*ibid.*).

ASCOCHYTA PISI, AN INJURIOUS FUNGUS ON PEAS.—The fungus *Ascochyta pisi* has been known for a long time as being destructive of the pea pod, but at the last meeting of the Royal Horticultural Society of Berlin, Professor Frank showed that it also adheres to the embryo. Such infected seeds are very difficult to recognise when dry, but by immersing them in water for twenty-four hours the mycelium develops and covers the swollen seed like a fine white skin about a millimetre thick; the seed then resembles a fly covered with the familiar *Saprolegnia*. Such infected seeds will grow to a height of 1½ to 2 feet, and appear

quite healthy, but suddenly they dry up at the base, owing to the ravages of the fungus (*Gardeners' Chron.*, [3], xvii., 584).

IMMUNITY OF EARTHWORMS FROM LEAD POISONING.—Hogg had noticed that the waste bark heap of the Elswick Lead Works was very prolific in earthworms, although the material of which the heap was composed was found to contain 2.48 per cent. of protoxide of lead. The intestines of the worms are always filled with the bark; the amount of lead in the dried worms was found to range from 1.85 to 2.6 per cent. of PbO, and since the worms were found to contain an average of 80 per cent. moisture, this would show that the living worms contained from 0.37 to 0.52 per cent. of PbO. The amount of lead found in worms free from intestinal matter was from 0.009 per cent. to 0.018 per cent. Worms were kept in soil with as much as 5 per cent. of white lead for about two months, after then some disappeared; from starvation the author thinks rather than from poisoning (*Chem. News*, lxxi., 223).

PREPARATIONS FOR DESTRUCTION OF INSECTS INJURIOUS TO FRUIT TREES.—The Board of Agriculture recommends several preparations for destroying caterpillars and other insect pests on fruit trees especially, apple, plum, and damson trees. The caterpillars of the winter moth are the most destructive, and when they are found eating the leaves their progress should at once be checked. Where hop-washing machines are available they may be used with advantage for syringing large trees; with those of smaller growth, however, the ordinary garden engine will be sufficient.

The following are the mixtures recommended:—

No. 1. Quassia, 7 lbs.; soft soap, 5 lbs.; water to 100 gallons.

No. 2. Quassia, 5 lbs.; soft soap, 5 lbs.; paraffin oil, 5 pints; to 100 gallons of water.

No. 3. Quassia, 4 lbs.; soft soap, 4 lbs.; Calvert's carbolic acid No. 5, 4 pints; water to 100 gallons.

No. 4. Soft soap, 6 lbs.; finely powdered hellebore, 2 lbs.; paraffin oil, 1 quart; well stirred together; water 100 gallons.

The soft soap should be dissolved in a tub of hot water; the quassia chips should be boiled in water and put into another tub.* Where paraffin (and carbolic acid) is used it should be well stirred up with hot soap and water before adding cold water. It is important that syringing should be commenced early directly there are any signs of infestation, and as the caterpillars appear in successive broods the syringings must be renewed if necessary.

Two arsenical preparations, Paris green and London purple, are largely used in America. They must, however, be used with great care. Paris green should be obtained in the damp form and mixed at the rate of 1 lb. to from 180 to 240 gallons of water according to the condition and age of the leafage. The mixture must be kept well stirred. It is not advisable to spray the arsenical solutions when the trees are in full blossom, unless the attack is very severe, in this case the solution must be weakened.

As the object is not to dislodge the larvae, but to poison their food, the solution should be sprayed on in fine jets as gently as possible.

London purple is used in a similar way in the proportion of 1 lb. to 200 or 260 gallons of water. Stock must not be put upon the grass in orchards where these arsenical solutions have been used, nor must these dressings be used for gooseberries for early picking, and herbs and vegetables for early use (*Gardeners' Chronicle* [3], xvii., 583).

* This is quite needless; the soap and quassia chips may be boiled together, and the alkaline liquor will more thoroughly exhaust the quassia.—[Ed., *Pharm. Journ.*]

Patent Office Business.

APPLICATIONS FOR PATENTS.

[From the *Illustrated Official Journal (Patents)*.]

No. 8444.—Improvements in apparatus for heating, cooling, or tempering water or liquids. April 29.
No. 8482.—Improvement in ophthalmoscopes. April 30.

No. 8516.—Improvements connected with the treatment of resin or resins for cleansing and other suitable purposes. April 30.

No. 8534.—Improvements in bottle-stoppering devices. April 30.

No. 8656.—An improved photographic negative marker. May 1.

No. 8672.—Improvements in bottles applicable for medicinal purposes and the like. May 2.

No. 8699.—Perforated sticking-plaster. May 2.

No. 8829.—A new or improved medicinal compound. May 3.

No. 8853.—Improved air-tight cap for bottles or jars. May 4.

No. 8932.—Pneumatic truss or belt for surgical use. May 6.

No. 9029.—An expanding stopper for closing the neck of a bottle after the ordinary cork has been withdrawn. May 7.

No. 9058.—An improved temporary stoppering for bottles to enable their contents to be drawn off as required; also usable as an opener for internally-stoppered bottles. May 7.

No. 9118.—Improvements in and relating to inhalers for consumption and other patients. May 8.

No. 9154.—An improved bottling cock for liquids. May 8.

No. 9190.—Improvements in and in the mode of corking or stoppering glass, earthenware, and similar bottles for aerated waters and the like. May 9, 1895.

No. 9243.—Improvements in apparatus for producing an instantaneous "flash" light for photographic purposes. May 9.

No. 9253.—A novel process for treating and preparing ordinary gelatin bromide dry plates for transfer of negative photographs and the employment of such dry plates for direct printing by ordinary printer's ink. May 9.

No. 9279.—Apparatus for enabling the height of liquid in closed vessels to be seen. May 10, 1895.

No. 9338.—Improvements in and relating to appliances for spraying liquids on to surfaces. May 11.

No. 9393.—Improvements relating to the air-tight closing of bottles, jars, cans, and other receptacles or vessels for sterilised liquids, preserves, or the like. May 11.

PATENTS PUBLISHED MAY 4.

Separating metals from ores (Atkins, G. J.).—The invention consists in replacing the potassium or other cyanide and the sodium chloride used in various processes for dissolving gold, platinum, silver, and other metals from their ore, by a "chloro-cyanide salt," preferably prepared by fusing together an alkaline ferro-cyanide such as that of potassium or sodium, with sodium chloride. Carbon may be added to minimise loss of cyanogen. In making the "chloro-cyanide salt," other than the above metals and chlorides may be used, and sulpho-cyanides may replace the ferro-cyanides. No. 7648 of 1894.

White lead (MacArthur, J. S.).—A weak neutral or slightly alkaline solution of potassium or sodium tartrate or of Rochelle salt is caused to percolate through

a thin layer of massicot, litharge, or other oxide of lead, or is agitated therewith at a boiling heat. The solution containing the bulk of the lead is filtered and a current of carbonic acid gas is passed through it at about the boiling temperature. The lead is gradually precipitated as carbonate. The liquor obtained on filtration is used for dissolving more lead oxide. No. 9655 of 1894.

Electrolysis of solutions (Hulin, L. P.).—The invention relates to the production of soluble products by electrolysis of solution, and comprises means for removing them as fast as they are formed, to prevent interference with the electric action. The ordinary porous diaphragms are dispensed with, and the electrodes are made of porous material, or are affixed to plates of such material. The liquid treated is supplied at slight pressure, so that it tends to pass through the electrodes, and the result is that the products formed at the cathode and anode respectively pass through into receivers. The inventor states that by this method a minimum of current is required, and mentions its special applicability to the formation of caustic soda and hydrochloric acid by electrolysis of brine. No. 11,587 of 1894.

Ozone (Lamprey, J. H.).—The pointed or serrated conductors employed in the "silent discharge" apparatus commonly used for producing ozone, are replaced by wires, on which are strung metal beads alternating with glass beads or other non-conductors. The inventor prefers to have one of the two conductors thus formed and passed along both sides of a pair of glass slips between which runs the other conductor, consisting of a single strip of metal, or the latter conductor may be replaced by a rod running through a glass tube, around which the compound conductor is arranged spirally or otherwise. No. 11,810 of 1894.

Sulphuric acid (Staub, A.).—Instead of the ordinary leaden-chamber process the gases used for the manufacture of the acid are caused to pass up a column or tower containing coke, perforated or other porous clay plates or pipes, or other material exposing a large surface, down which water slowly trickles. The waste gases escape at the top and the sulphuric acid passes out at the bottom of the tower. The gases pass in at slight pressure, and it is stated that less air is required than usual, and that a stronger acid is obtained. The waste gases may be passed through another tower, through which sulphuric acid is flowing, to absorb the nitrous acid gas. The acid so produced is passed through a third tower, where it is exposed to a current of air and sulphur dioxide to free it from the nitrous acid and to concentrate it. The waste gas is again treated as above, so that no nitrous gases are lost. No. 12,675 of 1894.

Treating nickel ores (Gibbs, W. T.).—Nickeliferous ores containing iron and copper are crushed, passed through a sieve of quarter-inch mesh, and roasted. The mixture of oxides of nickel, copper, and iron is then powdered and extracted with aqueous ammonia of specific gravity 0.900. The clear liquid containing the nickel and copper is heated in a series of three iron retorts, which may be connected so that the liquid passes successively through them. The nickel is precipitated as oxide or hydrate in the first retort, the copper as oxide in the third, and a mixture of the two in the second retort. Each retort has arrangements for condensing the ammonia which is evolved. No. 13,851 of 1894.

Vaporising perfumes, etc. (Breidenbach, R. B.).—The perfumed spirit, etc., is contained in a bottle, etc., having a tubular wick, through which passes the stem of a glass or other small globe resting on the top of the wick and coated with platinum. On lighting the spirit at the wick the platinum becomes red-hot and retains its heat when the flame is blown out, by pre-

moting the oxidation of the spirit. The perfume is thus constantly evaporating. No. 2747 of 1895.

Acetic acid (Thompson, W. P., communicated from Linde, C. von der).—Pyrolignite of lime is decomposed by means of sulphuric or hydrochloric acid as usual, but the distillation by which the acetic acid produced is separated is conducted *in vacuo* to prevent injury to the product by the distilling over of the tar products contained in the pyrolignite. No. 3477 of 1895.

Bed pan (Diamond, M. S.).—The pan is of sheet zinc or other metal with the usual opening, but a hinged door packed with indiarubber in order to keep it watertight, and normally secured by a clip, is formed at the thinnest end to facilitate cleansing. The handle is hollow, so that water may be poured through it into the pan. No. 4520 of 1895.

Bottles, stoppering (Brenzinger, A.).—The neck of the bottle is fitted with a valve, of which several forms are described by the inventor, so arranged that the contents may be discharged, but nothing can be poured into the bottle. No. 4583 of 1895.

Bottles, stoppering (Stevens, W. B.).—Comprises arrangements of valves or stoppers serving the same purpose as those described under the last patent, but of different construction. No. 4901 of 1895.

PATENTS PUBLISHED MAY 11.

Homologues of vanillin (Pitt, S., communicated from the 'Chemische Fabrik auf Actien,' formerly E. Schering).—Refers to patents No. 24,177 and 24,178 of 1893, and consists in employing a method described therein as yielding vanillin, for the production of homologues of vanillin for use in perfumery. The inventors mention among these compounds the ethyl, propyl, butyl, iso-butyl, amyl, and iso-amyl ethers of protocatechuic aldehyde. The method of production is fully described, and consists in combining benzol-sulpho-protocatechuic aldehyde with ethyl, propyl, etc., according to the ether which is required, saponifying it with potash, treating it with acid, dissolving out the compound with ether, and re-crystallising it from water. No. 10,112 of 1894.

Hydroxylamine, hydrazine, etc. (Wohl, A.).—The invention comprises the production of hydroxylamine, hydrazine, and their derivatives from nitrates, nitrites, ethers of nitric and nitrous acid, nitro-derivatives of the fatty and aromatic series, nitro-compounds, nitramines, nitrosamines, etc., by means of finely divided zinc or other readily-oxidised metal acting in a neutral solution and, preferably, in the presence of a neutral salt, such as chloride of sodium or calcium. The inventor describes the production of hydroxylamine free from ammonia from lead nitrate; of phenyl-hydroxylamine from nitro-benzene; of hydrazine from nitrosodiphenylamine; and of several analogous compounds. No. 11,216 of 1894.

Trade Marks Applied For.

[From the *Trade Marks Journal*.]

No. 186,748.—CHEMICAL SUBSTANCES used in manufactures, photography, or philosophical research, and anti-corrosives.—Burchard and Co., 35, Eastcheap, London, April 3, 1895. Device—A Sword-fish.

No. 184,515.—A SANITARY DISINFECTING SOAP not included in other classes.—The British Sanitary Soap Co., Ltd., 64, Sutton Street, Tuebrook, Liverpool, December 27, 1894. The essential particulars are the following.—The words "Imperial Times" and the combination of clock face devices.

No. 186,749.—CHEMICAL SUBSTANCES used for agricultural, horticultural, veterinary, and sanitary purposes.—Burchard and Co., 35, Eastcheap, London, April 3, 1895. Device—A Sword-fish.

No. 183,651.—COD LIVER OIL.—John Thomson Coats.—"The International Pharmacy," 64 and 65, Tolbooth Wynd, Leith, November 14, 1894. Device of fishing boats at sea, and name and addresses of applicant. The essential particular is the combination of devices.

No. 183,850.—PERFUMERY, including toilet articles and perfumed soap.—Plessee and Lubin, 2, New Bond Street, London, W. November 23, 1894. Device—A musk deer and the words: "Trade Mark—Musk deer."

No. 187,025.—TOILET AND PERFUMED SOAP.—Price's Patent Candle Company, Limited, 31, Threadneedle Street, London. April 11, 1895. Device—A figure climbing up candlestick.

No. 186,197.—TOILET SOAP.—David and William Gibbs, 16, Finsbury Circus, London, E.C. March 14, 1895. Word "Cameo."

Obituary.

TOWNSEND.—On March 24, Charles Townsend, Chemist and Druggist, late of Addiscombe. (Aged 81.)

MAYS.—On May 18, R. J. J. Mays, Chemist and Druggist, Westoe, formerly of Ryton-on-Tyne. (Aged 82 years.) Mr. Mays took a lively interest in public affairs, and was elected a member of the first Town Council for South Shields Ward, on November 13, 1850, to fill one of the vacancies caused by the election of an alderman, who had been returned as member of the Council on the 1st of that month, and was re-elected at subsequent dates. He was also a member of the Burial Board. The volunteer movement in its early days had in Mr. Mays an enthusiastic supporter, and he was identified for some years with the 5th Durham Rifles.

CLEGHORN.—On May 18, H. F. C. Cleghorn, M.D., Strathivithie, St. Andrews, N.B. Dr. Cleghorn was one of the oldest honorary members of the Pharmaceutical Society, having been elected in 1856. He was born in Madras on August 9, 1820, but educated at the High School of Edinburgh and at the University of St. Andrews. On leaving college in 1837 he was apprenticed to Professor Syme for five years, and held in the last year the position of house-surgeon in the Edinburgh Royal Infirmary. Graduating in 1841, he proceeded, at the age of twenty-two, to Madras, where he was attached to the Madras General Hospital to study Indian diseases. Later he was appointed Professor of Botany at Madras, and in 1855 the Governor of Madras, Lord Harris, requested Dr. Cleghorn to undertake the task of organising a Forest Department, so that the wasteful system of native cultivation might be checked. Subsequently, he and Sir D. Brandis were appointed Joint Commissioners for the Conservancy of Forests; and in 1867, when Dr. Brandis returned home, Dr. Cleghorn acted as Inspector-General of Forests. Finally, in 1869, Dr. Cleghorn retired from the Indian Service, and his conscientious and able work while a member of it was acknowledged in a minute of the Government, which said:—"His long services from the first organisation of forest management in Madras have without question greatly conduced to the public good in this branch of administration; and in the Punjab also Dr. Cleghorn's labours have prepared the way for the establishment of an efficient system of conservancy and working the forests of that province." In 1885 the University of St. Andrews bestowed on him the honorary degree of Doctor of Laws, and in 1888 a large number of his friends presented him with his portrait in appreciation of his services to the cause of arboriculture in India and in this country. The sum of £200 over was, at his request, devoted to forming a Hugh Cleghorn Forestry Library in the Museum of Science and Art in Edinburgh.

New Remedies.

[The notes given under this heading for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

OXYGEN GAS IN INFANTILE CATARRHAL PNEUMONIA.—Dr. J. Philip reports a case in which inhalation of oxygen gas had extraordinary restorative and sustaining effect in a nearly fatal case of pneumonia in a child aged thirteen months. When the gas was first applied in a gentle stream to the mouth and nostrils the patient was apparently sinking; after two hours the gas was applied at intervals, when collapse seemed imminent, as when the pulse became weak and cyanosis appeared; ultimately, in spite of a relapse, the child recovered (*B. M. J.*, vol. i., 1895, p. 1036).

PYROLIGNEOUS ACID AS A DISINFECTION OF TUBERCULOUS SPUTA.—According to Goriansky, pyroligneous acid is the most active of the wood-tar products for destroying tubercle bacilli, which it kills in cultures in one hour, and in sputum in two hours (*Pub. Health*, vol. vii., No. 8, p. 285, after *Rev. d'Hygiène*).

TREATMENT OF PSORIASIS.—Coffin, in moderate cases, removes the scales by alkaline washes, and then applies glycerin of starch, oil of cade, of each 3½ ounces; soft soap, 75 grains; salicylic acid, 45 grains. The parts are washed with warm water and tar soap every three or four days. In obstinate cases the scales are removed and the following ointment employed:—Ichthyol, pyrogallol, and salicylic acid, of each 30 grains; vaselin, lard, and lanolin, of each 1 ounce (*Brit. Journ., Derm.*, vol. vii., p. 167, after *Lo Sperimentale*).

IODOL IN AURAL ECZEMA.—In dry eczema of the auricle the parts are washed with a very weak warm solution of mercuric bichloride and the following salve applied:—Iodol, 15 grains; lanolin, 1 ounce. When the external meatus is involved the scales should be removed and the canal filled with iodol, 15 grains; white vaselin oil, 1 fluid ounce, and a plug of wool inserted to retain the fluid (*Brit. Journ. Derm.*, vol. vii., p. 167, after *Rev. Intern. de Méd.*).

GUAIACOL DRESSINGS IN GONORRHOEAL ORCHITIS.—Tavittian recommends guaiacol preferably in an ointment thus compounded:—Guaiacol, 5 parts; vaselin, 50 parts; to be applied locally to the affected part and to the groin.

PAPAIN IN ICTHYOSIS.—Papain is administered in the following pigment in ichthyosis:—Papain, 8 parts; salicylic acid, 4 parts; glycerin and castor oil of each 16 parts (*Journ. des Mal. Cutan. et Syph.*, Feb. 1895).

GUAIACOL IN GASTRALGIA.—Dr. Anders prescribes guaiacol in the following combination:—Guaiacol and glycerin of each 1 drachm; spearmint water to 1½ ounce. One drachm to be taken every four hours (*Therapeut. Gazette*, March, 1895).

MYDRIATIC SOLUTION CAUSING A DILATION OF THE PUPIL OF VERY SHORT DURATION.—Groenouw employs—Ephedrine hydrochlorate, 1 gramme; homatropine hydrochlorate, 1 centigramme; distilled water, 10 grammes. The instillation of 2 or 3 drops into the conjunctival sac causes a slight smarting, and is followed by mydriasis, which attains its maximum in half an hour, but which completely disappears in an hour, while no paralysis of the ciliary muscle takes

place, and the disturbance of vision is very slight and of short duration. The above solution gives better results than that of atropine in dilating the pupil for ophthalmoscopic examination (*Rev. Intern. de Med. et de Chir. Prat.*, pril 10, 1895).

JAUNDICE AFTER MALE FERN.—Grawitz has frequently observed jaundice to follow the administration of male fern; the active agent in producing this is filicic acid, and as this is more readily absorbed when dissolved in fatty oils, he questions the wisdom of giving male fern with castor oil. He also concludes that it is dangerous to give it to patients with hepatic cirrhosis, and quotes three such cases where the dose has been followed by fatal results (*Glasgow Med. Journ.*, vol. 43, p. 395, after *Am. Med. Surg. Bull.*).

TURPENTINE IN PERSISTENT HICCUGH.—Dr. Widmer Rolph has found the administration of a dose of 20 drops of turpentine successful in stopping an attack which had lasted nearly two days (*Lancet*, May 4, 1895).

SULPHIDE OF CALCIUM AS A PROPHYLACTIC OF INFLUENZA.—Dr. Green recommends a daily dose of one grain of sulphide of calcium in pill form. This treatment was tried successfully on the employees of two railways in the Isle of Wight, as well as in private practice; as far as could be ascertained no case of influenza occurred when the pills were taken regularly (*Brit. Med. Journ.*, May 4, 1895).

ERUPTION AFTER ANTIPIYRIN.—Dr. Gaston, at a meeting of the Société Française de Dermatologie, showed a patient who, one hour after taking a gramme of antipyrin experienced a violent itching, and found his body covered with large patches, some violet and livid, others pigmented and brownish, those at the angles of the mouth and on the lips resembling a false membranous stomatitis (*Med. Press*, May 5, 1895).

TREATMENT OF INFLUENZA.—Unless contra-indicated by such states as old age, vascular derangement, etc., antipyrin still remains one of the most pleasant and rapid remedies for relief of the symptoms of influenza. It should not be given in too large doses at too long intervals. By using the following formula relief is speedily secured and depressing effects obviated:—Antipyrin, 5 grains; bicarbonate of soda, 5 grains; sal volatile, 10 minims; tincture of opium, 2 minims; dilute water to half an ounce. One such dose every half an hour for three doses, then every two hours every three hours, and afterwards every four hours if needed. The combination of a small dose of laudanum appears to prevent nervous prostration. The headache of influenza can be generally best relieved by phenacetin thus combined: phenacetin, 5 grains; granular effervescent hydrobromate of caffeine to 2 drachms. To be taken in a wineglassful of water, and repeated every two hours for three doses unless relieved (*Practitioner*, April, 1895).

NAPHTHALIN IN TREATMENT OF OXYURIDES IN CHILDREN.—Prof. Ungar, after thoroughly clearing the bowels by means of a mild purgative, gives naphthalin in doses of 15 centigrammes for a child of one or one and a half years old, up to 40 centigrammes for twelve years, this dose being repeated twice daily for two days. Then a pause of eight days is made, and, if necessary, the course repeated. The naphthalin may be given in cachets or in powdered sugar. Fat should be avoided in the dietary, as it favours the absorption of the drug. The writer considers naphthalin given in this way less dangerous than santonin (*Intern. Med. Mag.*, after *Therap. Woehens.*, Feb., 1895).

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

SANDAL-WOOD OIL IN PILLS.

[860.] M. Calmel (*Rev. pharm. des Flandres*) mixes sandal-wood oil, 5 Gm., with calcined magnesia, 0.5 Gm., and then adds the mixture to colophony, 4 Gm., which has been melted at a gentle heat. The mass is said to be easily rolled and cut into pills after cooling.

ADULTERATION OF CATECHU (CUTCH).

[861.] According to Gehe and Co. adulterations of catechu in the countries where it is produced are largely practised, the chief material used being decoctions of the bark or wood of other trees; the following species are said to be employed for this purpose: "Man" (*Terminalia Oliveri*), "Tank-kyan" (*Terminalia tomentosa*), "Leen" (*Terminalia bialata*), "Hpagah" (*Terminalia chebula*), and in a lesser degree other species (*Pharm. Centralhalle*, April 25, 1895).

ACID CEMENT.

[862.] The following preparation is recommended for cementing glass, porcelain, or other vessels intended to hold corrosive acids:—

Asbestos.....	2 parts.
Barium sulphate	3 "
Silicate of sodium	2 "

By mixing these ingredients a cement strong enough to resist the strongest nitric acid will be obtained. If hot acids are dealt with, the following mixture will be found to possess still more resistant powers:—

Silicate of soda (50° Baumé.).....	2 parts.
Fine sand	1 part.
Asbestos powder ..	1 "

Both these cements take a few hours to set. If the cement is wanted to set at once, use silicate of potash instead of silicate of soda. This mixture will be instantly effective, and possesses the same power of resistance as the other (*Journal de Pharm.*).

SEPARATION OF SALICYLIC ACID FROM WINES.

[863.] Claassen first renders the wine markedly acid with sulphuric acid, then shakes out the salicylic acid with a mixture of ether and light petroleum ether of specific gravity 0.670. The salicylic acid is obtained in this manner directly in so pure a state that the ferric chloride reaction can be applied at once to the ethereal extract. Separation of the ethereal fluid takes place readily, far more rapidly than when pure ether or chloroform are employed. It is better to treat the unconcentrated wine direct by this method, since the ethereal solvent separates more readily from a dilute than from a denser vinous solution (*Pharm. Rundsch*, Feb., p. 38).

EMULSION OF CASTOR OIL.

[864.] The following has been suggested as an emulsion of castor oil, which might be added to the Pharmacopœia. Castor oil, 1 oz.; gum acacia, 4 drachms; elixir saccharin, 20 minims; essential oil almonds, 2 minims; oil of caraway, 2 minims; distilled water to 2 fluid ounces. Dissolve the gum in the water, add the oil gradually, and lastly the flavouring (*Practitioner*).

[The method here directed is scarcely that which should be followed. A little of the oil should be added first to the gum in a dry mortar; then water, a little; followed by the rest of oil; lastly remaining water.—Ed. Ph. J.]

CLEANING NICKEL-PLATED SURGICAL INSTRUMENTS.

[865.] Lay the instruments for a few seconds in a bath of 1 part of sulphuric acid and 50 parts of alcohol. Then wash thoroughly free from acid with water, rinse with alcohol and dry with a linen rag. This process cleans nickel perfectly, the yellowest and brownest articles being restored to brightness by leaving them in the acid solution for fifteen seconds (*Journ. Brit. Dent. Assoc.*, after *Literary Digest*).

CAOUTCHOUC CEMENT FOR INDIA-RUBBER SHOES.

[866.] No. 1, caoutchouc, 10 parts; chloroform, 280 parts. No. 2, caoutchouc, 10 parts; brown resin, 4 parts; thus, 2 parts; oil of turpentine, 40 parts. Solution No. 1 is produced by simply leaving the caoutchouc standing in a bottle with the chloroform. For solution No. 2 melt the finely cut caoutchouc and the resin, add the thus, and dissolve the whole in the oil of turpentine. Mix both solutions (*Zeitschrift*, xlix., 249).

CAOUTCHOUC CEMENT FOR CYCLO TYRES.

[867.] Bisulphide of carbon, 160 parts; gutta-percha, 20 parts; caoutchouc, 40 parts; isinglass, 10 parts. This cement is dropped into the crevices after they have been properly cleaned. If the rent is very big, apply the cement in layers. Bind up the rubber tyre lightly with thread, let dry for twenty-four to thirty-six hours, cut off the thread, and remove the protruding cement with a sharp knife, which must previously have been dipped in water (*Zeitschrift*, xlix., 249).

REMOVAL OF IRON MOULD FROM LINEN.

[868.] A. Schneider (*Pharm. Centralb.*) recommends the following two processes after extended experiments. The first is preferable. 1. The spots must be rubbed while the clothes are still wet with an aqueous solution of tannin, 1 in 20, then put aside for six hours. Then rinse the clothes wash thoroughly with soap, and rinse again in clear water. Rub the spots with an aqueous solution of oxalic acid 1 in 20, and set aside for six hours. Last of all wash off the superfluous oxalic acid with clean water. 2. Rub the spots, after soaking, with a 1 per cent. aqueous solution of sulphide of lime, put aside for six hours. Run clean water on the spots, wash with soap, again run on clean water. The spots will now have turned black; then rub with diluted acetic acid, put by for six hours, and finally rinse out in clean water (*Zeitschrift*, xlix., p. 240).

DEPILATORY COLLODION.

[869.]—

Iodine	75 centigrammes.
Oil of turpentine	20 drops.
Castor oil.....	2 grammes.
Alcohol.....	10 "
Collodion	30 "

To be applied once daily for three or four days. When the collodion is removed, the surface beneath is rendered free from hair (*Bull. de Pharm. de Lyons*, after *Journ. de Pharm.* May 1, 1895).

LOTION FOR CHAPPED HANDS.

[870.] Chapped hands, fissured lips, and analogous affections are benefited by the following lotion:—Compound tincture of benzoin, 10 minims; rectified spirit, 2 drachms; rose water, 30 minims; glycerin, to 1 fluid ounce. To be applied to the chapped surfaces after washing with soap and warm water and thoroughly drying (*Therapeut. Gaz.* [3], xix., p. 271).

FERROPYRIN AND FERRIPYRIN.

[871.] It would appear that the same substance has been described under these different names. It would therefore be preferable to limit the nomenclature to ferripyrrin (*Therap. Monats.*).

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the Editor, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

*. Queries should be addressed "Editor," and will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTERS.

THE PRELIMINARY EXAMINATION.

An Associate, who veils his identity under the *nom-de-plume* of "Excelsior," writes as follows:—I read with much pleasure the letter of your correspondent, Mr. A. Campbell Stark, in your issue of last week, and I cordially agree with his remarks all through. It does certainly seem to me to be commencing at the wrong end to teach chemistry and physics to students who do not know how to think algebraically. I used to be much surprised, when studying for the Minor, to find that my tutor, himself an M.P.S., never worked any of his problems by algebra, in fact, algebra was never mentioned either by him or by my fellow-students, and such a thing might not have existed. When up for the Minor too, I noticed that candidates did not seem to grasp the bearing of questions on theory which would not have presented any difficulty if algebra had been part of their mental training, and it seems to me that students would be better able to assimilate the technical information laid before them by their tutors if this were the case; in other words, the knowledge would be taken in easier and would come out easier. The raising of the standard of the Preliminary would also lessen the immense gap—which at present exists between that and the Minor—and the student who has the brains to compass a Preliminary equivalent to that required by the Medical Council will not consider the Minor such a terrible bogey when he comes to it. I think, with your correspondent, that the Pharmaceutical Council ought to take the matter up now, and adopt the same list of Preliminary examinations as that accepted by the Medical Council for registration as a medical student, and I do not see why this should be thought too severe a test.

C. A. T., Dumbarton, also refers to this subject, and says:—I, for one, would like to ask what is the aim of the Society in getting students to pass such an examination. I think the subjects useless in the extreme, and would suggest that a student who holds a certificate of having passed the sixth or ex-sixth standard of our modern schools, and having an intention of being a chemist, should have that accepted for the Preliminary, and that an examination in the shape of a little practical dispensing, pharmacy, chemistry, etc., be passed before the age of twenty-one years, and the present Minor examination in the usual way. The existing gap between the Preliminary and the Minor would thus be lessened. Of course, Mr.

Stark's method might suit a few who realise that it has been a good job for them that their fathers were born before them, but the poor fellows who (like the poet) are born not made druggists would be simply out of it.

ANSWERS.

"PHARMAKOS."—Your inquiry should have been addressed to the "Editor." The inflorescence is from the mountain ash (*Pyrus aucuparia*, Rosaceae). The formations on the leaves are galls caused by the activity of some insect. Possibly we may be able to ascertain what the insect is and inform you later.

"HUMULUS."—The specimens sent are from *Rhus coriaria*, the leaves of which, when dried and powdered, furnish sumach.

JOHN H. SMITH.—The account sent does not possess sufficient general interest to merit publication.

J. D. ROSE.—You will observe that the conditions are now altered.

J. R. HILL.—Many thanks for enclosure.

"DEMOSTHENES."—Compressed sulphuretted hydrogen is supplied in cylinders by Baird and Tatlock, Cross Street, Hatton Garden, E.C.

J. F. J. RODERES.—What you require is probably tinctoria acet. (Bademacher). To prepare this, boil together copper sulphate, 90.5 Gm.; lead acetate, 112.5 Gm.; and distilled water, 510.0 Gm. Subsequently add to the decanted and cooled liquid, spirit of wine, 390.0 Gm. See Hager's 'Handbuch der pharmaceutischen Praxis' for further details.

COMMUNICATIONS, LETTERS, ETC., have also been received from Messrs. Cracknell, Ewell, Greenish, Jesper, Nightingale, Prior, Rehman, Redhead, Shepperson, Sleath, Smith, and Umney.

The publication of several reports is unavoidably deferred until next week.

Publications Received.

[Publishers are requested to state the price of books sent for review.]

FALLOWFIELD'S PHOTOGRAPHIC ANNUAL 1895-6. Pp. 780. Price 1s. 6d. post free. (Jonathan Fallowfield, 146, Charing Cross Road, W.) From the Publisher.

A TREATISE ON PRACTICAL CHEMISTRY AND QUALITATIVE ANALYSIS. By FRANK CLOWES, D. Sc., London. Sixth edition. Pp. 469. Price 8s. 6d. (J. and A. Churchill, London.) From the Publishers.

JOHN DALTON AND THE RISE OF MODERN CHEMISTRY. By Sir HENRY E. ROSCOE, D.C.L., LL.D., F.R.S. Pp. 216. (Cassell and Co., London.) From the Publishers.

REPORT OF THE PHARMACY BOARD OF VICTORIA FOR 1894. Pp. 10. From the Secretary and Registrar.

L'INDUSTRIE CHIMIQUE. By A. HALLER. Pp. 348, with six illustrations. Price 5 francs. (J. B. Baillière et Fils, 19, rue Hautefeuille, Paris.) From the Publishers.

BULLETIN VAN HET KOLONIAAL MUSEUM TE HAARLEM FOR MARCH, 1895. Pp. 28, with four illustrations. (J. H. de Bussy, Amsterdam.) From the Koloniaal Museum, Haarlem.

THE LAW OF COPYRIGHT IN DESIGNS. By LEWIS EDMUNDS, D.Sc., LL.B., assisted by T. M. STEVENS, M.A., B.C.L., and MARCUS W. SLADE, B.A. Pp. 291. (Sweet and Maxwell, Ltd., 3, Chancery Lane, London.) From the Publishers.

A TEXT-BOOK OF CHEMISTRY. By S. P. SADTLER, Ph.D., and HENRY TRIMBLE, Ph.M. Pp. 950. (J. B. Lippincott Company, Philadelphia and London.) From the Publishers.

"THE MONTH."

Aconitine. Following up the conclusion that this alkaloid is constitutionally an acetylated benzaconine, Dunstan and Carr have endeavoured to prepare it synthetically by acetylating benzaconine. Various experiments made with that object have furnished diacetyl, triacetyl, and tetracetyl derivatives, but the monoacetyl derivative expected to correspond with aconitine could not be obtained. The products obtained by acetylating benzaconine are described as being apparently non-toxic, and in that respect differing from acetylated derivatives of aconitine. In reply to the paper by Freund, published in the March number of the *Berichte (Ph. J., ante, p. 773)*, the authors state that the last of their three papers published in the *Journal of the Chemical Society*, for March, 1894, was not presented to the Chemical Society at the same time, January 18, 1894, as the other two, because the quantitative determination of the acetic acid produced in the conversion of aconitine into isaconitine (benzaconine) had not been made when the papers were read before the Society and that, for the same reason, the formula representing isaconitine to be an isomer of aconitine was retained in the first of the papers published in that number of the *Journal of the Chemical Society*. The statement of the quantitative determination of acetic acid, which was subsequently included in the third paper by direction of the President of the Chemical Society, while the *Journal* was passing through the press, is also stated to be the only complete proof which has hitherto been adduced that aconitine is acetyl-benzaconine. In regard to the empirical formulae for aconitine and its derivatives suggested by Freund as being more consistent with his analytical data, the authors prefer to adhere to the formulae they have hitherto adopted (*Journ. Chem. Soc., lxvii., 459*).

Molecular Modifications of Glucose. C. Tanret describes some interesting molecular modifications of glucose, which he has obtained artificially. Glucose α , the ordinary glucose, when crystallised, has a rotatory power $[\alpha]_D = +106^\circ$; whilst in the case of glucose β , formed when an aqueous solution of glucose α is boiled for a few minutes, $[\alpha]_D = +52^\circ.5$, and for glucose γ , produced in small quantities when amorphous glucose is heated for some time at $100^\circ - 110^\circ$, $[\alpha]_D = +22^\circ.50$. The aqueous solution of glucose α also yields glucose β if heated for seven or eight hours at 15° , or for thirty hours at 0° , and instantly in the cold on the addition of 1/100 of potash. In alcoholic solutions the transformation is less rapid and less complete. The three forms of glucose are all crystalline, and the cryoscopic method proves them to have the same molecular weight. Glucose γ in aqueous solution is completely transformed into glucose β , under the same conditions as glucose α , the rotatory power rising to $[\alpha]_D = +52^\circ.5$ as rapidly in one case as in the other. The action in alcohol is also the same in both cases (*Comp. rend., cxx., 1060*).

Gedanite. O. Helm expresses the conviction that the gedanite in which E. Aweng found succinic acid was in reality not true gedanite, but a well-known variety of succinite. True gedanite is, according to Helm, free from succinic acid (*Archiv., cccxxiii., 191*).

Argon in Minerals.

Professor Hodgkinson has obtained from euxenite and samarskite, when heated *in vacuo*, twelve times their volumes of gas, the colour and spectrum of which when it was sparked pointed to the presence of a hydrocarbon. On adding oxygen and exploding, a decided contraction was observed, which was greatly increased on introducing potash. The spectrum was no longer like that of a hydrocarbon after absorption of the excess of oxygen, but had a close resemblance to that of argon (*Chem. News, lxxi., 248*).

Methylamine Hydrochloride. A simple method for obtaining large quantities of methylamine hydrochloride in a pure state has just been described by Brochet and Cambier. The principle of the method depends upon the interaction of formaldehyde and ammonium chloride. About 2 kilogrammes of commercial formaldehyde (40 per cent.) is mixed with 1 kilogramme of ammonium chloride in a flask of about 3 litres capacity. Vigorous action takes place, and when completed the liquid is distilled, when a large quantity of methylal $[H \cdot CH(OCH_3)_2]$, produced by condensation of the formaldehyde with the methyl alcohol used as the solvent, distils over. The residue is then further concentrated by evaporation until the ammonium chloride in excess just begins to separate. The liquid is next cooled, and the ammonium chloride separated by filtration; the filtrate is a solution of almost pure methylamine hydrochloride, which is separated by evaporation of the filtrate *in vacuo* and subsequent purification by repeated crystallisation from absolute alcohol. When excess of formaldehyde is employed a certain amount of trimethylamine hydrochloride is formed, but only traces are obtained by the above method, using excess of ammonium chloride. The method gives very good results, since from 2 kilogrammes of commercial formaldehyde, containing about 40 per cent. of real formaldehyde, 850 grammes of methylamine hydrochloride (about 95 per cent.) was obtained by the first crystallisation. It is thus easy to prepare 1 or 2 kilogrammes of pure methylamine hydrochloride in the course of a day or two (*Bull. Chim. Soc. Paris [3], xiii., 533*).

Sugar and Alcohol from Peat. Verveig obtains sugar and alcohol from peat by heating for 24 hours an equal quantity of peat and 3 per cent. sulphuric acid under steam pressure of nearly two atmospheres. The resulting black, turbid liquid is then saturated with calcium carbonate, filtered, and decolorised with animal charcoal. Part of the sugar obtained is converted into caramel, the rest fermented with water and yeast at a suitable temperature, and the alcohol obtained by distillation is rectified. The author considers that 1000 kilogrammes dry peat will furnish at least 60 litres pure alcohol. The sugar obtained from peat will doubtless never be of any value except as a source for preparing alcohol (*Phar. Cent., xxxvi., 290*).

Chemistry of the Thyroid Gland. C. Schaerges, in a preliminary communication, states his conviction from experiments made, that the thyroid gland contains a considerable proportion of lecithin, the presence of which he regards as having an important relation to the physiological action of the gland (*Pharm. Zeit., xl., 314*).

Helcosol. J. Juresca has prepared and examined a bismuth pyrogallate containing 57 per cent of bismuth, and protests against the name helcosol (*Pharm. Post*, xxviii., 169).

Methyl Salicylate. H. T. Thayer prepares artificial winter-green oil by taking salicylic acid, 505.47 Gm., and methyl alcohol, 690.85 Gm. The acid is added in small portions to the alcohol contained in a wide-mouthed flask until a saturated solution is obtained. This is next heated to boiling point on a water-bath, the flask being connected with an upright condenser. Dry hydrochloric acid gas is then passed through the hot solution until saturated, the flask disconnected, 10 grammes of salicylic acid added, the flask replaced, and the solution again saturated with hydrochloric acid gas. The additions of salicylic and hydrochloric acids are repeated in the same way until all of the former has been added, and the passage of hydrochloric acid gas is then continued for about two hours. The upper of the two layers of liquid in the flask is then decanted, and the dark brown oily liquid remaining washed with water until no longer acid to litmus paper. Next, distil it from a flask with the aid of steam, separate the oil from excess of water by means of a separating funnel, and completely dry by the use of anhydrous calcium chloride. The process is described as practical and economical, and yielding an oil of good quality. With the quantities mentioned the yield is above 500 Gm. of a colourless or slightly yellowish oil of agreeable odour which improves on keeping, s.g. 1.187, and b.p. 221° C. Ethyl salicylate of a good quality can be prepared by the same process (*Am. Journ. Pharm.*, lxvii., 243).

Chitin in Fungi. E. Gilson has been able to prepare pure chitin from the tissues of certain fungi, *Agaricus campestris* being mainly experimented upon. The fungi in small pieces were treated successively with dilute caustic soda solution, boiling dilute sulphuric acid, alcohol, and ether. The residue after this treatment was white, and on drying became hard, compact, and horny. It possessed all the properties of chitin, being insoluble in all solvents except strong acids. Treated with warm, concentrated hydrochloric acid it furnished numerous crystals of glycosamine hydrochloride, and heated to 180° with caustic potash it yielded mycosin. Chitin has been prepared thus from *Amanita muscaria*, *Cantharellus cibarius*, *Hypholoma fasciculare*, *Polyporus officinalis*, *P. fumosus*, *Russula*, *Boletus*, *Tricholoma*, *Bovista*, and *Claviceps purpurea*. It appears to serve the same purpose in the cellular membrane of fungi that cellulose does in that of phanerogams (*Comp. rend.*, cxx., 1000).

Toxicity of Aconitine. At a recent meeting of the Société de thérapeutique, M. Mouquet stated that a horse weighing about 400 kilos. died some thirty-five minutes after the subcutaneous injection of 9 Mgm. of aconitine nitrate (*Rép. de Pharm.* [3], vii., 180).

Rhus Toxicodendron. Pfaff and Orr find Maisch's toxicodendric acid to be inactive, and ascribe the poisonous properties of *Rhus toxicodendron* to a principle resembling, but not identical with, cardol (*Pharm. Zeitung*, xl., 339).

Disinfection by Formaldehyde Vapour. Gambier and Brochet publish in the *Revue d'Hygiène* a suggestive paper on the value of formaldehyde vapour for destroying all dust germs, even anthrax bacillus and its spores, provided that the room be hermetically sealed and the exposure is sufficiently prolonged. Moulds and nonpathogenic forms of bacilli are most resistant, but those causing putrefaction quickly succumb. The penetrating power of the gas was shown in the complete sterilisation in twenty hours of dust placed in beakers to the depth of a centimetre, the beakers being placed in a cupboard. Formaldehyde disinfection would be valuable in the case of breakable or precious objects; it has the great advantage over corrosive sublimate spray that it is not necessary to displace the majority of articles. Any germs that escape a first operation are destroyed by a second.

Localisation of Brucine and Strychnine. Sauvan states, as the results of some preliminary micro-chemical tests on the seeds of *Strychnos nuxvomica* and *S. gaultheriana*, that these alkaloids of nuxvomica are found solely in the cells of the albumin and of the embryo, and not in the seed coats. Further, the reactions for strychnine and brucine do not take place in the same cell, so that it would appear that the alkaloids exist separately in adjoining anatomical elements. The author promises to continue his researches in this direction (*Journal de Pharm.* [6], i., 497).

Alkaloids of Berberis. H. Pommerehne ascribes to oxyacanthine the formula $C_{15}H_{21}NO_3$; it is to be regarded as a tertiary base, and is strongly dextro-rotatory. The formula of berbamine he finds to be $C_{18}H_{25}NO_2$. From berberine he has prepared a neutral sulphate, a true bicarbonate, and a well-defined hydrocyanide (*Archiv.*, cccxxiii., 173).

Methyl Salicylate from Coca Leaves. M. P. Romburgh has detected methyl-salicylate in the distillate from coca leaves. It appears to exist pre-formed in the leaves, but only in very small quantity, varying from 0.004 per cent. in *Erythroxylon bolivianum* to 0.13 in very young leaves (*Rec. des trav. Chim. through Chemiker Zeitung*, xix., 130).

Rhubarb Stalks. R. Otto has examined the petioles of several varieties of rhubarb in common use for culinary purposes, and finds that, in addition to considerable quantities of insoluble calcium oxalate, they contain as much as 2 to 3 per cent. of oxalic acid either in the free state or as a water-soluble oxalate. Otto considers that the continued use of these petioles as a vegetable must be injurious to health (*Landw. Jahrb.*, 1895, through *Apoth. Zeitung*, x., 354).

American Storax. K. Mohr describes, as an eye-witness, the collection of American storax from the sweet gum trees (*Liquidambar styraciflua*) in Mississippi State. The trees are completely ringed by a cut penetrating deep into the sap wood; the resin exudes from the wood and hardens to clear colourless drops. Occasionally cavities filled with resin are formed in the bark. The resin is used as a chewing gum and also for catarrh (*Ph. Rundsch.*, through *Pharm. Zeitung*, xl., 338).

Adulteration of Senega Root.

A new adulteration of senega root has been found to have been practised by an American firm by mixing the roots of *Triosteum perfoliatum*, Linn., *N. O. Caprifoliaceae*, with the genuine article to the extent of 25 per cent. It is interesting to note that this same root is also used as a substitute for ipecacuanha. The genus *Triosteum* comprises five species. *Triosteum perfoliatum* is most frequently found in the eastern parts of the United States. The thick knotty rhizomes act as a purgative, and in larger doses as an emetic. In Georgia the rhizome is used for rheumatism; the hard seeds are supposed to furnish a substitute for coffee. The drug was formerly official in North America. It is yellow to dark brown in colour, of peculiar shape, about 9 Cm. long, and shows traces of the aerial stems on top. The rootlets projecting from the main root are as a rule 0.5 Cm. thick, but sometimes grow as thick as 1.2 Cm. They are on the whole very similar to senega, but they do not possess the characteristic keel of true senega root; therefore on careful inspection the difference is evident (*Phar. Cent.*, xxxvi, 280).

Medicines of Dutch W. Indies.

Boorsma finds the bark of *Plumieria acutifolia* to contain a crystalline non-poisonous principle, plumierid; boiled with dilute hydrochloric acid the solution of this body assumes first a yellow, then a red colour, finally producing a brown precipitate without the formation of any sugar. The bark of *Scavola koenigii* also contains an indifferent bitter principle apparently devoid of toxic action. The seeds of *Euchrestia hornefeldii* contain a toxic, those of *Sterculia javanica* a non-toxic alkaloid. From the leaves of *Jasminum glabriusculum*, Boorsma isolated a brownish-yellow amorphous bitter principle. The tubers of *Dioscorea hirsuta* are used in Java as a food-stuff. For this purpose it is necessary to cut them in thin slices and expose them for twenty-four hours to a stream of running water to free them from their poisonous properties. Boorsma has extracted from the tubers two uncrystallisable alkaloids, which he has named dioscorine and dioscorecine; both are poisonous, the former being the more active (*Pharm. Zeitung*, xl, 339).

Black Sulphur.

L. F. Kebler has examined three purchased samples of the preparation sold under this name in the United States, with the following analytical results:—(1), Sulphur, 81.58 per cent.; antimonious sulphide, 12.68; sand and earthy matter, 5.74. (2) Ground limestone, 53.00 per cent.; coal-dust, 47.00. (3), Sulphur and other combustible matter, 57.09 per cent.; metallic iron, 17.91; sand and earthy matter, 25.00 (*Am. Journ. Pharm.*, lxvii, 242).

Tincture of Iodine.

This preparation, according to A. Sapin, ought to be kept exposed freely to light rather than in the dark, and the stock renewed every month, only a small quantity being made at one time. Prepared according to the Belgian Pharmacopoeia, the tincture contains 76.49 per cent. of pure iodine, and of two specimens prepared at the same time, the one exposed to light contained 65.91 per cent. at the end of a year, while that kept in the dark contained 63.48 per cent. only. The explanation of these facts would seem to be

that the hydriodic acid and ethyl iodide, formed by the action of the iodine upon alcohol, are readily decomposed by light, and the iodine is thus liberated again. The influence of temperature in diminishing the proportions of free iodine seems to be less than would naturally be imagined. Impure or re-distilled alcohol that has been already used for some preparation causes the free iodine to disappear more rapidly, by reason of organic matters present which rapidly combine with it. Freshly-prepared tincture of iodine, it is stated, will not froth appreciably when agitated, but in proportion to the age of the preparation and the alteration that has taken place the froth formed is abundant (*Rev. pharm. des Flandres*, through *Répertoire* [3], vii., 197).

Photography in Natural Colours.

A. and L. Lumière point out that the indirect method of photographing in natural colours has not received a proper practical application because of the difficulty experienced in selecting the colours and in preparing and superposing the monochromes. They recommend the use of orange, green, and violet screens for preparing three series of negatives presenting a maximum of sensibility to the rays which the respective screens allow to pass. Specimens of photographs so prepared were exhibited before the Paris Academy of Sciences. The printing and superposition of the monochromes have been successfully accomplished by employing bichromated gelatin, to which are added substances insoluble under certain conditions. If, for example, 5 per cent. of ammonium bichromate and 5 to 10 per cent. of silver bromide in the form of emulsion be added to a 10 per cent. solution of gelatin, and the preparation be spread in a thin layer upon a plate of glass, a surface is obtained which can be exposed under a negative and will reproduce the picture by the action of light. After exposure the plate is washed with cold water, and the portion of the film acted upon by light, being rendered insoluble, remains and serves to print the image from on the application of suitable colours. The silver bromide, which by the way, may be replaced by other insoluble precipitates, is easily removed by the action of sodium hyposulphite, and proofs can then be printed from the plate in any colour, showing all the graduations of tint present in the negative. Polychrome prints may be obtained by receiving on the same plate monochrome red, yellow, and blue images successively, by means of three corresponding negatives, and isolating each image from the preceding one by an impervious layer of collodion. By employing dyes of greater or less concentration or by simple decoloration with water, variation in the relative intensity of the monochromes is readily obtained (*Comp. rend.*, cxx., 875).

Simple Pill Counter.

According to Buwa, an extremely useful and simple pill counter can be obtained by making a shallow tray in the shape of an isosceles triangle. If the pills are thrown into the tray and shaken to the apex the first row (in the apex) will contain one pill, the second two, the third three, and so on. The number of pills on the tray can therefore be easily ascertained by counting the rows and referring to a previously calculated table (*Pharm. Post*, xxviii, 237).

Panification of Brown Bread.

According to J. Chappuis, brown bread is the result of the action of a ferment, cerealine, found in the endosperm of wheat, upon starch paste. This induces lactic and glucosic fermentation, and in the oven transforms starch into dextrin and glucose, whilst the gluten is also altered, the bread produced being acid, brown, and pasty. Chappuis has observed that hydrogen peroxide, which is without action upon the epicarp and endocarp of wheat, is quickly decomposed by the embryo and endosperm, and that the latter then lose the property of converting starch into dextrin. He also notes that cerealine extracted from bran by water liquefies starch normally, but not after treatment with hydrogen peroxide. The ferment being destroyed, therefore, by hydrogen peroxide, addition of the latter to inferior flour results, in the case of unleavened bread, in the production of white bread, equal in appearance to that obtained from the best flour, instead of brown. Since yeast is killed by the peroxide, fermentation is impossible whilst the latter is present, but as soon as the excess is dissipated the dough becomes capable of rising under normal conditions. It is stated, in conclusion, that wheat soaked in hydrogen peroxide solution will not germinate (*Comp. rend.*, cxx., 933). In another paper upon the same subject L. Bouteux states that the cause of the brown colour may be the drying of the gluten, or the action of atmospheric oxygen upon the bran in the presence of water, but in neither case is it due to fermentation, whilst the acidity of the leaven is actually a protection against browning (*Comp. rend.*, cxx., 934).

New Indiarubber Cork.

A French firm has recently introduced a new form of indiarubber cork. The rubber is hollow and at one end a hard disc is attached, through a perforation in which a rod passes to the bottom of the cork. On pressing the rod the stopper elongates, and can be introduced into the neck of the bottle, on releasing the pressure the stopper contracts in length, but increases in diameter, and will be firmly held by the neck, which of course should be slightly smaller than the cork (*Apotheker Zeitung.*, x., 332).

Starch as a Mountant.

J. H. Baldock, in a discussion on the use of starch as a mountant, pointed out that the starch must be brought into a state of disintegration, not solution, the usual plan being to make it into a cream with cold water, and then, while constantly stirring, pour on boiling water until thickening takes place. More completedisintegrationisobtained, however, by subsequently boiling for a few minutes, whilst a clearer jelly is obtained, and better keeping properties are secured. The paste should not be too thick, and if not made fresh at the time of using, should be boiled well, and have a little boric or salicylic acid or oil of cloves added as a preservative. Alum is objectionable in starch paste for photographic purposes. H. D. Gower said he prepared a paste that kept well by adding an ounce of starch to half a pint of water and heating, with constant stirring, until thickening occurred. Heat for a few minutes longer, remove from the source of heat, add half an ounce of glycerin and, when nearly cold, half an ounce of methylated spirit. A few drops of oil of cloves or other essential oil may be added if desired, but this is not necessary (*Photography*, 1895, p. 210).

Calcium Permanganate for Purifying Water.

Bordas and Girard suggest the employment of calcium permanganate for the purification of drinking water, since the use of this salt obviates the introduction of a foreign soluble salt, as when the permanganates of sodium or potassium are employed. To remove an excess of calcium permanganate, the lower oxides of manganese are used, which reduce the permanganate to the insoluble binocide. Water thus treated contains neither dead organic matter nor living organisms; but contains a little calcium carbonate and minute traces of peroxide of hydrogen, which tend to assure the asepsis of the fluid (*Comp. rend.*, cxx., 689).

Relative Volume of Powders.

To determine the relative volume of powdered preparations, take a small round measure of about 2 decimetres in height and 1½ centimetre in diameter, which must be graduated from the bottom upwards in cubic centimetres; put a small amount of powder into the vessel by means of a funnel made of black glazed paper, and tap the measure against a rigid surface until after one to two minutes the volume of the powder does not diminish. Powders which have become aggregated must of course be re-powdered; if the number of the observed cubic centimetres is divided by the weight in grammes of the powder taken, a number is obtained which Glückmann (*Zeitschr. d. Osterr. Apoth. Ver.*, 1895, 214) terms the relative volume. By means of this volumetric method, the approximate nature of certain preparations can be indicated (*Phar. Cent.*, xxxvi., 279).

Lysolum Bohemicum.

Under this name a new preparation of tar has been brought into the market by a firm in Bohemia; it is a dark brown liquid of agreeable odour, and will mix in any proportion with ordinary or distilled water. The solution is permanently clear, and of a yellow colour, which darkens after a time without the liquid becoming turbid. The solution does not affect the hands, instruments, clothing, etc. To disinfect wounds a 1 to 2 per cent. solution is used; for disinfecting instruments a solution of 0.2 per cent. will be found sufficient (*Pharm. Cent.*, xxxvi., 280).

Loaded Sponges.

According to the *Oil, Paint and Drug Reporter* the rise in price in the various kinds of Florida sponges has given rise to an ingenious method of artificial weighting. Formerly lime and sand were employed for this purpose; now it is stated glycerin and solution of silicate of sodium are used, the latter being selected for its admirable weighting properties and the ease with which it can be manipulated. One sample when tested showed a loading of about 25 per cent. of this substance.

Agar-Agar in Glycerin Suppositories.

Lomuller uses agar-agar (*Gelidium corneum*) instead of gelatin to make glycerin suppositories. It produces a more transparent mass which does not stick to the mould, does not clot, and gives a more elegant article when finished. The method employed is as follows:—Take 10 parts of agar-agar in small pieces and 200 parts of water, heat until a soft paste is formed, then add with constant stirring 200 parts of glycerin (*L'Union Pharmaceut.*, xxxvi., 197).

NOTES ON THE ASSAY OF IPECACUANHA.

BY R. A. CRIPPS, F.I.C.

The rapidly approaching revision of the B.P. renders opportune any contribution to the subject of standardisation, especially of such important drugs as ipecacuanha.

It is necessary to determine :—1. The principle or principles to be determined. 2. The process of assay. 3. The standard to be adopted.

I desire to offer some remarks upon each of these points as applied to ipecacuanha.

1.—THE PRINCIPLE OR PRINCIPLES TO BE DETERMINED.

The researches of Paul and Cownley have considerably increased our knowledge of the alkaloids of ipecacuanha; they have isolated three, emetine, cephaeline, and another. The alkaloidal substance described by Whitby and myself in a paper read before the British Pharmaceutical Conference in 1891 ('Year-Book,' 1891, p. 385), would seem to correspond with a mixture of the first two. Indications of the presence of another crystalline alkaloid were obtained and mentioned in the same paper. In addition to these there is also present a fourth alkaloid not removeable from ipecac. by rectified spirit, unless previously set free from its natural combination by means of an alkali; it may, however, be readily extracted by water or dilute acid (see 'Year-Book' 1891, p. 392; also Braithwaite and Umney 'Year-Book,' 1889, p. 390).

I have been unable to confirm Arndt's statement that ipecacuanha contains a volatile alkaloid, although I have specially sought for it in two distinct samples. The relative proportions in which these alkaloids are present have not been thoroughly

determined; it is probable that ipecacuanha, in common with other drugs, containing several alkaloids, contains them in widely divergent quantities. I have myself proved that the proportion of the third alkaloid, to the combined emetine and cephaeline, may vary from one-twentieth to nearly one-fourth. However, it seems to be generally admitted that the amorphous ether-soluble alkaloid (emetine) is the most important. Paul and Cownley state that cephaeline also acts as an emetic, whilst the action of the other two has not been made known. Under these circumstances it seems to me that we cannot do more than adopt a standard of total alkaloids; later on, when, perhaps, our knowledge will be more precise, it will be easy to improve by adopting an assay of one or more to the exclusion of the others.

2.—THE PROCESS OF ASSAY.

In conjunction with A. Whitby I published a paper in the *Ph. J.* [3], vol. xix., p. 721, in which the results of many assays were included, and we there expressed the opinion that the process of Lyons was the best published up till that time. We also described a similar process in which acetic ether was used for extraction of the alkaloids from the crude drug. Further experience of this latter process has not confirmed my good opinion of it, for I have at times met with samples of the root which have failed to yield the whole of the alkaloids to that solvent, either alone or acidulated. I have therefore been thrown back upon Lyons' process, which I have since compared with that of Keller ('Year-Book,' 1893, p. 122, and 1894, p. 128). In the three samples compared the results have been :—Lyons', 2.32, 2.60, and 2.16 per cent.; Keller's, 2.27, 2.32, and 2.10 per cent. Although

Table of Results of Ipecacuanha Assay.

Name of Author.	Variety of Drug.	No. of Samples.	Process Adopted.	Percentage of Alkaloids (Average).
Ransom	Brazilian	10	Modified Flückiger (hot ammoniacal chloroform)	1.66
	E. Indian	1	Modified Flückiger (hot ammoniacal chloroform)	1.70
Lyons ..	Brazilian	48	Dragendorff's (titration by Mayer's solution).....	Near 2.60 (5 under 2.0 p.c.) (10 over 3.0 p.c.)
Snow	"	5	Precipitation by platinic chloride	2.84
Beck	"	Not stated	Extraction by chloroform and alcohol	3.20
Hooper	E. Indian root	1	Extraction by alcohol and titration by Mayer	1.79
	" stem	1	Extraction by alcohol and titration by Mayer	1.13
Kottmayer	Brazilian	Not stated	Extraction by acidulated alcohol, purification by lead acetate and lime, and solution in chloroform..	2.32 2.26 1.81
	E. Indian	3	Not stated.....	1.05
Cæsar and Loretz ...	Carthagens	1	"	.54
	Carthagens	3	"	1.38
Keller	Brazilian	7	Extraction by ammoniacal ether and chloroform, separation by acid, titration by alkali	2.58 2.18
	Carthagens	3	Extraction by cold ammoniacal chloroform, followed by hot, ditto, and separation	2.01 1.68
Attfield	Brazilian root	2	Not stated.....	2.11
	" stem	2	"	1.25
Paul and Cownley..	" root	8	"	About 2.0
	" stem	3	"	
	Carthagens	Not stated	"	

both methods have advantages, I prefer that of Lyons, exhaustion being carried out by percolation or maceration, and the alkaloids extracted by ether, followed by chloroform, the residue from the evaporation of which is weighed.

Other methods have from time to time been published, but none seem to me so suitable as that of Lyons; many undoubtedly give low results.

3.—THE STANDARD TO BE ADOPTED.

Closely connected with this is the settlement of the variety or varieties of *ipeacuanha* which it is desirable to render official. The question is really whether the Carthagena drug shall be admitted in addition to the Brazilian, the others being all very weak in alkaloids. Published statements vary as to the relative richness of these two kinds, but the preponderance of evidence is in favour of the latter being distinctly more powerful. In the table which follows I have given the results of several workers. Moreover, Paul and Cownley state that the Carthagena drug contains a distinctly larger proportion of the crystalline base—cephaeline—than the Brazilian, the stems of this latter being similarly rich in cephaeline. As the object of all standardisation is the attainment of greater uniformity, I think it would be distinctly retrograde to introduce another certain source of variation by making both drugs official. If so there could be no valid objection to the recognition of an admixture of the stems of Brazilian *ipeacuanha* also.

Of these processes that employed by Lyons (Dragendorff's) gives results which are rather high. Flückiger's process, on the other hand, yields low results, whilst that of Cæsar and Loretz appears to do the same to a far greater degree. However, taking the average results of each observer, the mean of all would be as follows:—

Brazilian root, 2.26 per cent., or omitting Cæsar and Loretz' low figures, 2.415 per cent.

Brazilian stem, 1.35 per cent.

East Indian root, 1.57 per cent., or omitting Cæsar and Loretz' low figures, 1.92 per cent.

Carthagena root, 1.84 per cent., or omitting Cæsar and Loretz' low figures, 2.00 per cent.

My own results of assay, using either Lyons' process or the acetic ether method, have been as follows:—

Brazilian Root.

9 samples under	2.0 per cent.
4 " from 2.00 to 2.09	"
10 " " 2.10 " 2.19	"
11 " " 2.20 " 2.29	"
13 " " 2.30 " 2.39	"
8 " " 2.40 " 2.49	"
5 " " 2.50 " 2.99	"
1 " above 3.00	"

Average of 61 samples = 2.24 per cent.

Brazilian Stems.

One sample yielded 1.70 per cent.

Carthagena Root.

Five samples yielded from 1.56 to 2.12 per cent.; average = 1.81 per cent.

Adding these results to those quoted above, we obtain the following averages:—

Brazilian root average of at least 146 spls., 2.25 per cent.

Brazilian root (omitting Cæsar and Loretz' figures) of at least 143 spls., 2.34 per cent.

Carthagena root, average of at least 13 spls., 1.83 per cent.

Carthagena root (omitting Cæsar and Loretz' figures) average of at least 10 spls., 1.90 per cent.

Stem (Brazilian and E. I.) average of at least 7 spls., 1.42 per cent.

These results show the marked inferiority of the Carthagena drug.

To sum up, I would suggest:—

1. That the Brazilian root be alone official.
2. That the process of Lyons be officially recognised.
3. That *ipecac.* be required to yield by this process not less than 2.0, nor more than 2.5 per cent. of alkaloids.
4. That the preparations of *ipecac.* be made by the present official methods, except that in the case of the wine a weaker acid be used for extraction, and the dry extract be assayed and used in such proportion that the finished wine shall contain 0.1 per cent. of alkaloids.

It may be urged in objection to this third suggestion that so low a minimum as 2.0 per cent. leaves room for admixture of stems or Carthagena root for the purpose of dilution. Personally, however, I would prefer an easily attainable "standard" such as this to one which would give so much trouble and cause the rejection of a considerable proportion of the genuine drug entering this country, as would be the case should a standard, e.g., of 2.2 to 2.7 per cent., be required. The best settlement of this point, however, would be for those who, like myself, have assayed considerable numbers of samples, to tabulate the results for publication, and at the same time detail the processes of assay used, so that comparison may be made by the editor of the new B.P.

THE UPAS TREE.

Professor Wiesner, during his recent stay in Java, ascertained some interesting particulars with reference to the celebrated Upas tree, *Antiaris toxicaria*. Contrary to the general impression that this tree is not uncommon in Java and Sunda Islands, an impression manifested by the statements in the leading text-books, Professor Wiesner learnt that the original specimen described by Leschenault has been felled, and in the whole of Java there were only three individual trees belonging to the genus *Antiaris* and closely allied to *A. toxicaria*. Of these three trees one was found by Dr. Greshoff to be innocuous, and was therefore *A. innoxia*, Blume, a species supposed by many botanists to be only a variety of *A. toxicaria*. The second tree proved to be poisonous, one drop of the latex being sufficient to kill a dog; the third has not been examined.

The tree has, however, been cultivated in the botanical garden, and there are now in the plantation at Tjikimöh about seventy specimens.

Neither in the botanical garden nor in the plantation could any ill-effects be observed, even after having been for some time in the neighbourhood of the trees, and the accounts of the poisonous nature of the exhalations from it are much overstated. Dr. Burck has shown that the plant gives off no injurious vapours, and the latex is poisonous only when it passes through a wound into the blood. Material brought from Java by Professor Tichomirow has been examined by Gorodetsky. The bundles in *Antiaris toxicaria* are bi-collateral; the laticiferous cells which do not anastomose with one another contain a granular, light brown, strongly refractive matter. The juice contains a glucoside antiarin, the best reaction of which was found to be the change of colour from yellow to orange-red, shown by boiling a solution with picrate of sodium (*Pharm. Zeitschr. f. Oesterr.*, xxxiii., 313, and *Pharm. Zeitschr. f. Russland*, xxxiv., 248).

SOME MEDICINAL PRODUCTS FROM THE STRAITS SETTLEMENTS.

BY E. M. HOLMES, F.L.S.,

Curator of the Museum of the Pharmaceutical Society.

Nearly three years ago attention was directed in this Journal (vol. xxiii., p. 388-390) to several products possessing medicinal properties, and to others of possible use in the future, by reason of being very active agents. Several of these could not be botanically identified at the time, owing to the difficulty in obtaining flowering specimens of the plants yielding them. Mr. Leonard Wray, who sent the previous specimens, has now been able to obtain the plants in flower or fruit, and has sent other specimens, which seem of sufficient interest to be noticed here.

BLAH.—The leaves are stated to be used as a substitute for opium, and Mr. Wray believed them to be obtained from a Rubiaceous plant of the genus *Nauolea* (l. c., p. 390). The plant that he has now sent does belong to that natural order, but to the genus *Mitragyna*, and agrees well with the description of the plant published by Korthals in the *Verh. Nat. Gesch. Bot.* (p. 160) under the name of *Mitragyna speciosa*. The plants of this genus have the flowers arranged in globose heads, each flower nestling in a circle of spatulate bracts. The most curious part of the flower is the stigma, which is mitre-shaped and ribbed longitudinally, and covers the top of the style like an extinguisher, but only the lower half is free from the style. The flowers are stated by Mr. Wray to be of a pale greenish-yellow colour, but in the dried state they are brown. Now that the origin of the drug is known, there should be no difficulty in procuring it in sufficient quantity to test its medicinal value.

PRUAL.—The experiments made by Dr. Stockman (*Ph. J.* [3], vol. xxiv., p. 561), on the physiological action of the root of this plant, showed that it probably contains two active principles, one acting on the heart muscle, and the other on the terminations of the motor nerves as a paralyser. The imperfect specimens previously sent, consisting of leaves only, were doubtfully referred to at Kew (*Kew Bulletin*, Nov., 1891, and *Ph. J.* [3], xxiv., p. 582), to the Rubiaceous genera, *Lasianthus* or *Urophyllum*. The specimens with fruit that have now been sent show that the plant evidently belongs to that natural order, but not to either of the genera named. The specimens now received have only immature fruits, but Mr. Wray informs me that he has sent three flowers of the plant to Kew, and I learn from Dr. Stapf that he has been able to identify the genus, and will shortly publish his identification of the species.

IPOH AKER.—Mr. Wray states that he has now obtained the fruit of this species of *Strychnos*, which was formerly considered at Kew to be a species of *Strychnos* closely allied to *S. maingayi*, but which seemed to me to approach more nearly to *S. wallichiana*. The material now received at Kew will therefore be probably sufficient for clearing up the exact species yielding this poison.

POISON ROOT, No. 4281.—Concerning the root sent under this number, Mr. Wray says: "The roots of this plant are used by the Malays for poisoning

rats. It is pounded up and mixed with boiled rice, and is said to be very effective." The plant which Mr. Wray sends with the root proves to be *Dianella nemorosa*, Lam., a liliaceous plant of wide distribution, extending from Madagascar and India and to Australia and the Pacific.

POKO LULAY.—Under this head Mr. Wray writes, "This is the Malayan varnish tree. The varnish is one of the very best there is. It is nearly white, very brilliant, and extremely hard. It is used for polishing the woodwork of weapons, such as the kris. The bark of the tree is cut and the sap caught as it runs out. The sap is then cooked in an iron pan to expel the water, and while hot is mixed with some drying oil or turpentine. The varnish so made is applied to the wood with a piece of rag. It takes from two to four days to dry. Specimens of the resin, or getah lulay, as collected by the Malays, and of the prepared varnish, as well as herbarium specimens of the plant in fruit, have been sent by Mr. Wray. The plant evidently belongs to the genus *Garcinia*, and is nearly allied to *G. merguensis*, Wight, having elliptical lanceolate-acuminate leaves with a narrow obtuse apex. The leaves are coriaceous in texture, but thin, and the veins are not prominent on the upper surface, which is shining. The midrib is prominent on both sides, and the veins are slightly so on the under surface. The fruit is oblong, oval, about half an inch long, and one-third of an inch broad, with an entire discoid punctate stigma depressed in the centre. I have not however, been able to identify the species in the absence of flowers.

BUAH KUMBONG SA MANGKOK.—Mr. Wray says "This fruit swells up in water and is used in cases of dysentery. I have not been able to obtain full specimens of this tree, and it has not yet been described. The tree is a tall one, and the fruits fly far and wide, so that it is not easy to find the tree in the jungle, even when you come upon its fruits." This fruit resembles that of the "Bungtalai" of Siam, which is also known by the name of "Boa-tams pajang" (*Pharm. Journ.* [2], iii., p. 6 [3], viii. p. 747, 784, and in China ('Hanbury Science Papers,' p. 250) as Ta-hai-tse. The fruit in the specimens furnished by Mr. Wray has the large boat-shaped follicle (which opens long before the seed is ripe) attached to the seed. The seed differs from that of "Bungtalai" in being covered with a dense velvety pubescence, and in the inner surface of the follicle being abundantly furnished, and the external sparingly so, with stellate hairs.

The other specimens sent by Mr. Wray consist of Kulitlawang or "Cullawan" bark (*Ph. J.* [2], xxiii., p. 390), and a bottle of the hair oil used by the Malays, made of coco-nut oil and pandanus flowers.

SODIUM BISULPHITE in crystals, with 7 molecules of water of crystallisation, was found deposited from a large quantity of solution during the severe frost by R. E. Evans and C. H. Desch (*Chem. News*, May 24). They were stored in a well-stoppered bottle, and, as the weather became warmer, partly deliquesced, leaving anhydrous sodium bisulphite in fine pearly-white crystals.

EMULSIONS.*

The emulsions are liquid preparations consisting of oily, fatty, resinous, or otherwise insoluble substances suspended in watery liquids by the intervention of gum, mucilage, or other viscid material called emulsifying agents. They may be divided into (1) natural and (2) artificial emulsions.

Natural emulsions.—In natural emulsions are included all products of animal or vegetable origin, consisting of oily or resinous substances so combined with gum or albumin as to be readily miscible with water without separation.

Of animal products milk and egg yolk are the most typical emulsions, since their fat-globules are so finely divided and so perfectly distributed in the watery liquid as to require considerable agitation to separate them from the albuminous envelope, in order to obtain the fat. The operation of "churning" milk to produce butter is a good illustration of this, and is the reverse of the process of emulsification.

The milk juice of many plants, consisting of oil and gum or albumin, is deposited in fruits and seeds upon evaporation of the water. The nuts, especially almonds, are rich in this mixture, which, upon trituration with water, is restored to its original form of milk juice or emulsion. The official almond emulsion is a good example. Associated with resin and sometimes with ethereal oil the milk juice of many plants exudes and dries into semi-solid masses or tears. Examples of these we have in the gum-resins, ammoniac, and asafetida, which furnish official emulsions by beating them in a mortar with water. The amount of gum contained in a gum-resin is not always sufficient to emulsify the other constituents, resin and ethereal oil, and it is then necessary to add gum artificially in order to produce complete emulsification.

These natural products are the most perfect emulsions, and to simulate them is the object of pharmaceutical art. A natural emulsion may be greatly diluted with water without causing separation of the oil. This is the best test to indicate that an emulsion is perfect.

Artificial emulsions.—These are made by mixing the oil with a certain proportion of the emulsifying agent, adding water and trituration of the mixture in a mortar or agitation in a flask. There are various methods, but these are general rules:—

The emulsification of the oil should be complete before the mixture is made up to the required measure. When alcoholic liquids are to be added, they should first be diluted as much as possible. Salts should be dissolved before being added. No heat should be employed, as the oil separates in an emulsion when heated. Emulsions should be freshly prepared and be preserved in a cold place.

The most common emulsifying agents, in the order of their general value, are:—

Powdered gum acacia.—With the powdered gum contained in a capacious flat-bottomed wedgwood mortar the oil is gradually incorporated. To this one

and a half times as much water as of gum is added at once, and the mixture rapidly triturated with a rotary motion of the pestle. Soon the mixture becomes stiff and assumes a milk-white colour, the pestle motion producing a characteristic "crackling" sound when the emulsification is complete. This so-called "mother emulsion" may now be diluted to the required measure and other substances, flavours, etc., be added.

The proportion of gum required varies with different oils, an oil rich in gum, such as castor oil, requiring less gum than an oil poor in natural gum, as cod-liver oil. The following proportions hardly ever fail to produce complete emulsification: Oil, 4 parts; gum, 2 parts; water, 3 parts. Whenever a lesser proportion of gum is used water must be decreased in proportion, viz.: One and a half times as much water as of gum employed. The ethereal or volatile oils require a much larger proportion of gum than the fixed oils.

Powdered tragacanth.—This may be used in the same way, or in the form of mucilage, but it does not produce as permanent emulsions as does gum acacia.

Mucilages of acacia or of Irish moss (N. F.).—These are not as satisfactory as powdered gum; while they produce good emulsions the division of the oil-globules is not as thorough as in the preceding; emulsification being incomplete the mixture more rapidly separates into a heavier, watery liquid and a lighter, thick gelatinous emulsion, which requires thorough mixing before use.

Extract of malt.—Extract of malt is an excellent emulsifying agent, when its use is admissible. The oil should be added to the malt extract contained in a capacious mortar and incorporated in small quantities at the time. A good article will emulsify an equal volume of cod-liver oil.

Condensed milk and egg yolk.—These produce the most perfect emulsions and also the most palatable, but they rapidly ferment and spoil.

Glycerin and sugar added to emulsions for the purpose of preservation and palatability induce separation, and their use is not advisable.

Emulsification "by intervention" is the best and only reliable method to be employed with ethereal oils and all substances of themselves not emulsifiable. It is illustrated in the official chloroform emulsion. Oil of turpentine, for example, is emulsified by dissolving the turpentine oil in twice its volume of a bland fixed oil (almond oil), incorporating an equal weight of powdered acacia, adding water and proceeding as with an ordinary emulsion.

Pancreatin.—Pancreatin emulsionises fats in preparing them for digestion, but it does not produce a permanent emulsion when used artificially. While, therefore, not a reliable emulsifying agent, it aids the assimilation of oils and its addition to emulsions is sometimes therapeutically desirable. As it is only active in alkaline media, the emulsion should be prepared with a little sodium bicarbonate.

The addition of alkalis to emulsions should be avoided. Soaps are not emulsions; neither is the use of soap-bark to be recommended.

* Lecture from the Course of the National Institute of Pharmacy. Reprinted from the *Western Druggist*.

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Editorial Department.

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Advertisement Department.

Advertisements and remittances must be sent to the Publishers, 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders should be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brembridge, — 17, Bloomsbury Square, London, W.C.

COMPANY TRADING.

EVER since the time when in consequence of deficient expression of the main object of the Pharmacy Act, 1868, it became possible for an association of persons unqualified under that Act to carry on the business of a chemist and druggist, such company trading has been a source of great dissatisfaction and annoyance to registered chemists. It has been felt that the manifest intention of the Act, even from the point of view of the general public interest, was that none but legally qualified individuals should be entitled to keep open shop as chemists and druggists for the retailing, dispensing, or compounding of poisons, and that no persons not already engaged in such business at the passing of the Act should be capable of commencing such business until they had been duly examined as to their practical knowledge, and their names entered upon a register kept for the purpose of making their qualification known to the public. Since the qualification referred to by the terms of the Act was unquestionably personal, the provision for restricting the business to such legally qualified individuals appeared to be sufficient for the purposes of the Act, until it was held that corporations were not included within the scope of its provisions, because they could not be examined as an individual could, and that a company is outside the Act even when composed of unregistered persons.

One very exasperating consequence of this construction of the Pharmacy Act is the formation of what have been termed "bogus companies" for the purpose of carrying on the business of a chemist and druggist under the provisions of the Companies Acts, and the competition to which registered chemists have thus been exposed has justly

been regarded as unfair to them, as well as a practical violation of the Pharmacy Act as regards the public. Within the past week a very important decision (see page 1110) has been given by the Lords Justices in the Court of Appeal in regard to companies of this kind, which appears likely to open the way for dealing with cases of "one-man companies" which involve evasion of the Pharmacy Act as well as the Companies Acts. Speaking of the intention of the Companies Acts, Lord Justice LINDLEY remarked that while the Legislature contemplated that it would provide means for the encouragement of trade—by enabling persons to associate together for carrying on business with a limited capital, and without liability or risk beyond the extent of such capital—it never contemplated an extension of limited liability to an individual trader. In the case under consideration there was the requisite number of seven shareholders in the company, but six of them were relatives of the principal shareholder, and they held only one share each. Though the company was therefore regarded by Lord Justice LINDLEY as duly created, he held that it was created for an illegitimate purpose, and was merely a device to enable one man to carry on trade with limited liability under the protection of the Companies Act, but contrary to its true intent and meaning. Lord Justice LOPEZ also concurred in regarding the company—perfect as it was in its machinery—as being, in truth and fact, the business of one man. He had the beneficial interest in it, and the company was a mere *nominis umbra*, under cover of which he secured advantages. Hence he considered that it would be lamentable if such a scheme could not be defeated, for if it were permitted to succeed, the Companies Acts would be perverted to protecting a device never contemplated by the legislature, besides being in reality opposed to the policy and provisions of the Acts. In his opinion the incorporation of such a company might be set aside by a *scire facias*.

Although the considerations involved in this case were of a purely pecuniary nature, the views expressed by the Lords Justices have an important bearing on the question whether the bogus or one-man companies formed for the obvious purpose of evading the provisions of the Pharmacy Act, do not fail to secure protection under the Companies Acts, or, at any rate, whether such a misapplication of the principle of limited liability should any longer be permitted to enable an unqualified person to evade the Pharmacy Act by associating with himself six members of his family, and carrying on in that way a business which he could not carry on as an individual. In many instances of this kind the illegitimate object is clearly apparent, and in regard to such misapplications of the Companies Acts it is well that the question of their legality

has been raised. On this point the *Standard* remarks that such concerns have of late grown up with startling rapidity, and if the Companies Acts do not warrant the extension of the principle of limited liability to sole traders which is involved in them, the sooner the public is made aware of the fact the better. In the case of bogus drug companies, two Statutes are evaded at the same time, and therefore such cases present additional reason for enquiry.

CHEMICAL WORKS INSPECTION.

THE LEBLANC soda works still hold their own against those of the ammonia-soda process because of the bleaching powder which they alone can produce, and Mr. BERNARD E. SMITH, the inspector for the north of England, reports that whilst the number of alkali works is stationary, and the work has been anything but briak, the salt decomposed showing a decrease of 10 per cent., the bleaching powder works have been active, though they have produced a less quantity than in the previous year. The deposit of the objectionable alkali waste has been stopped, partly by its use for sulphur-recovery, and partly by the carriage of the refuse to sea. The ammonia process is shown to be continually gaining as regards the extent of the output of soda on the LEBLANC process, but, as already stated, the latter still possesses the commercial advantage accruing from the practical monopoly of the production of bleaching powder. Mr. EDWARD JACKSON, reporting upon the South Midland District, says the number of chemical works registered is—9 alkali works, 157 scheduled and other works, total 166. The following are the separate processes under inspection:—3 alkali works, 4 hydrochloric acid (cylinder) works, 2 hydrochloric acid (waste pickle recovery) works, 2 copper works, 26 sulphuric acid works, 46 chemical manure works, 2 gas liquor works, 2 muriate of ammonia works, 2 chlorine works, 8 cement works, 8 salt works, 7 sulphur recovery, 18 nitric acid works, 7 nitrate of iron works, 4 Venetian red works; total, 234. Seven additional works have been added to the register during the year—three for the manufacture of sulphate of ammonia, two for the manufacture of salt, one for the manufacture of chemical manure, one for the manufacture of chlorine. Two works have been closed—chemical manure and sulphate of ammonia. There has been a net increase of five works for the year. There are 71 works on the register for the manufacture of sulphate of ammonia, muriate of ammonia, and the concentration of gas liquor. One sulphate of ammonia plant has been stopped during the year, and three additional works have been registered. Under the heading of "Chlorine Works," special reference is made to the fact that in addition to the WELDON and PECHINEY chlorine processes in operation in

the district, a new plant, around which a great amount of interest centres, has been erected at the works of the Aluminium Company at Oldbury, for the manufacture of caustic soda and chlorine electrolytically from brine, by CASTNER'S patents. This process is described as though it were in practical operation, and practically pure caustic soda is said to be produced, whilst chlorine of 95 to 97 per cent. purity is obtained free from hypochlorites, the remainder being hydrogen. The main features of Mr. CASTNER'S process have been already briefly described in the *Journal* as consisting in the use of a moving body of mercury, which completely separates, and so prevents any re-combination of, the products of electrolysis.

PHARMACY IN VICTORIA.

BY the courtesy of Mr. H. SHILLINGLAW, the Secretary and Registrar of the Pharmacy Board of Victoria, we have been favoured with an advance proof of the report of the proceedings at the celebration of the completion of the additions to the Melbourne College of Pharmacy. The report will be found at page 1104 of this week's *Journal*, and should prove of interest to our readers as showing the estimation in which the College and pharmacy generally are held by the Victoria Government. As already pointed out in the *Journal*, Victoria is happy in possessing what is virtually an ideal Pharmacy Act, and there is every reason for believing that, when the existing conditions of commercial depression in Australia have passed away, pharmacy in that colony will enter upon a more prosperous career, and fix itself more firmly even than at present in the truly professional position which is its due. Meanwhile, the cordial congratulations of British pharmacists are freely tendered to their brethren across the sea, who are wished the greatest possible measure of success in carrying out their educational programme.

DOMINION PHARMACEUTICAL ASSOCIATION.

STEPS have been taken by the Pharmaceutical Association of the Province of Quebec, the oldest pharmaceutical body in Canada, to initiate the formation of a Dominion Pharmaceutical Association, and the *Canadian Druggist* reprints a circular letter on the subject addressed to the various pharmaceutical bodies in Canada. The matter was once before under consideration, in June, 1893, but delay on the part of provincial associations in responding to the communications addressed to them prevented further steps being taken at the time. The council of the Quebec Association has now appointed a committee to take up the matter, and a suitable constitution and bye-laws have been drafted. Copies of these have been sent to each provincial association with a request for comments or suggestions.

PHARMACEUTICAL EXHIBITION AT BRUSSELS.

THE *Société royale de pharmacie de Bruxelles* will celebrate the fiftieth anniversary of its foundation, on August 15 next, by a national congress of pharmacy at Brussels. In connection with this there will be an international exhibition of pharmaceutical apparatus and products. Both the Congress and the exhibition will last for three days. The five sections of the Congress will deal with pharmaceutical legislation and ethics, theoretical and practical pharmacy, professional interests, the analysis of food-stuffs and commercial products, and hygiene and toxicology, respectively. The six sections of the exhibition will be devoted to fixtures, appliances, drugs, pharmaceutical preparations, accessories, and special products. Particulars may be obtained of M. L. VAN HULST, pharmacien, 12, rue Malibran, Brussels.

THE PHARMACOPŒIA COMMITTEE OF THE GENERAL MEDICAL COUNCIL.

AN important part of the business transacted at the meeting of the General Medical Council, on Tuesday last, was the appointment of the Committee by which arrangements will be made for the revision of the British Pharmacopœia. After some discussion as to the number of members to be appointed on the Committee, it was resolved on the motion of Dr. LEECH that the Committee should consist of the President of the Council, Sir RICHARD QUAIN, four members to represent England and Wales, two to represent Scotland, and two to represent Ireland. Those elected for England were Sir DYCE DUCKWORTH, Mr. BRUDENELL CARTER, Dr. LEECH, and Dr. MACALISTER; for Scotland, Dr. TUKE and Dr. McVAIL; for Ireland, Dr. ATTHILL and Dr. CHARLES MOORE. The first meeting of the Committee was to be held on Wednesday, at half-past twelve.

THE METRIC SYSTEM.

STRONG as British prejudices are in favour of the system of weights and measures with which the public is familiar, and great as the indifference is with which the advantages of the metric system are regarded by the majority, the fact that commercial transactions are now so largely carried on according to this system may be expected before long to exercise a powerful influence in its favour. From that point of view it seems probable that legalising the use of metric weights and measures for trade purposes will be the most desirable means of promoting the ultimate general adoption of the system. In evidence given by the President of the Pharmaceutical Society before the Select Committee last week (*ante*, p. 1065), this view was expressed in a manner which made considerable impression upon the members of the Committee. If the legalising of the metric system were adopted, one great obstacle to its introduction into the British Pharmacopœia would be removed.

Proceedings of Societies in London.**CHEMICAL SOCIETY.**

A meeting was held on Thursday, May 16, 1895, the President, A. Vernon Harcourt, F.R.S., in the chair. The following papers were read:—

KJELDAHL'S PROCESS FOR THE DETERMINATION OF NITROGEN.

BY DR. B. DYER.

The nitrogen in manures, food-stuffs, and proteids is generally determined by means of Kjeldahl's method or some one of its many modifications, and in this respect the soda-lime method of analysis has been superseded in most agricultural laboratories. In chemical laboratories, however, which are devoted mainly to organic research, the method generally employed for the determination of the nitrogen is either the absolute method of Dumas or the soda-lime process.

In order to determine whether Kjeldahl's method can be employed generally, the author has made a series of analyses of the nitrogen contained in a number of organic compounds selected as types, and the results of this investigation are now communicated. The method employed was as follows:—A weighed quantity of the compound varying from 0.2 gramme to 10 grammes is placed in a round-bottomed glass flask, made preferably of Jena glass, and about 20 C.c. of strong sulphuric acid and a drop of mercury are then added. After gentle warming about 10 grammes of potassium sulphate is added, and the contents of the flask heated till the liquid is water-white, during which process a large quantity of sulphur dioxide is given off. The liquid after cooling is then transferred to a large flask fitted with a rubber stopper with two perforations, in one of which is inserted an ordinary tap-funnel, and in the other the extremity of a long tube of block tin, which is bent twice at right angles, and acts as a condenser. To the acid liquid excess of alkali is now added, and the whole boiled for half an hour, when the ammonia distills over through the tin tube, and is received into an Erlenmeyer flask containing standard acid, which is titrated in the usual manner. When mercury is used in addition to sulphuric acid a little potassium sulphide is added, as well as a little zinc foil to prevent bumping.

Blank experiments are always first made with sugar, and the error of experiment allowed for in subsequent determinations. When nitrates are thus analysed it is necessary to add phenol or salicylic acid to the substance, next the sulphuric acid, and lastly about 2 grammes of zinc. The whole is then allowed to stand till action has ceased. In determining the nitrogen in ammonium nitrate very low results were obtained, and this was found to be due to the escape of nitrous oxide, formed by the heat of the reaction with sulphuric acid. This is best remedied by adding the sulphuric acid from a beaker suddenly so that the whole of the ammonium nitrate is at once covered.

Very good results were obtained by this method with such compounds as uric acid, asparagine, caffeine, strychnine, quinine, pyridine, and the nitrates of potassium, ammonium, and urea. With aromatic

compounds containing amidogen, or of the azo type, accurate results could only be obtained by the addition of salicylic acid and zinc, such compounds being nitro-benzene, nitraniline, azobenzene, etc. Hydroxylamine hydrochloride analysed by the ordinary method only gave 3 per cent. of nitrogen instead of the theoretical 20.21 per cent., but accurate numbers were obtained by using sugar and zinc in place of salicylic acid. Acetaldoxime behaved in a similar manner, and yielded similar results. Though accurate results were obtained by analysing potassium cyanide and ferrocyanide in the usual manner, such could not be obtained with the ferrocyanide, but by the addition of thiosulphate of sodium and zinc accurate results were obtained.

All methods failed to yield satisfactory results by analysis of sodium nitro-prusside, phenyl-hydrazine, or the glucosazone. The author, as the result of these experiments, recommends the trial of this method in place of the absolute or soda-lime process as being quicker and easier than the older method.

In the discussion which followed, Dr. Kipping pointed out that this method was not to be preferred to those generally in use. The apparatus for the older methods was always at hand in organic laboratories, and the absolute method of analysis was much simpler and more certain than the method proposed by the author. A fatal objection to this method was the necessity of adding such an agent as sugar, salicylic acid, or thiosulphate of sodium in order to obtain accurate results, and the uncertainty of knowing which of these agents to add would render results untrustworthy.

NOTE ON LIQUATION IN CRYSTALLINE STANDARD GOLD. BY DR. ROSE.

The author had investigated the question of the homogeneity of alloys of gold with metals, as bismuth and lead, other than those found in standard gold. Gold which reaches the refiners often contains traces of these metals, and since the value of an ingot is judged by an assay of an outer portion of the mass, it is important to know if this is a fair sample of the whole ingot. Alloys of gold with silver and copper have been shown to be homogeneous, so the effect of traces of lead and bismuth was examined in the following manner: A quantity of standard gold consisting of molten sovereigns was mixed with 0.2 per cent. of bismuth and then the molten mass poured into a spherical mould. The metal on examination was found to be brittle and non-homogeneous, the interior of the mass being richer in gold than the exterior, the proportions of gold found being 912.8 in the outer cut to 913.8 in the inner sample.

An alloy with 0.2 per cent. lead was found to give similar results, and the same non-homogeneity of the mass was found with alloys of lead and silver.

This is due to the fact that the bismuth and lead remain molten after the gold and other metals have solidified, and there are thus two freezing points of the alloy.

In assaying gold containing lead or bismuth, it is necessary not only to take a sample of the exterior of the ingot, but also to take samples from the interior of the mass by boring or otherwise.

PREPARATION OF THE ACTIVE LACTIC ACIDS, AND THE ROTATION OF THEIR METALLIC SALTS IN SOLUTION.

BY DR. PURDIE.

The salts of the two optically active lactic acids have been separated by means of the zinc ammonium double salt, and for this purpose solutions of zinc lactate and ammonium lactate are mixed, and a crystal of the desired modification added, when the mass crystallises and as much as 90 per cent. of the active salt can be obtained. It is thus possible to obtain any modification of lactic acid required.

A comparison was now made of the freezing-point and molecular rotation of the various metallic salts.

On plotting the results of molecular rotation as a curve, with the angle of rotation and the concentration as co-ordinates, it was found that in aqueous solutions the molecular rotation of all the salts except silver increases with dilution. This must be due to ionic rotation, resulting from dissociation of the salt; in the case of the silver salt, however, the rotation increases with concentration of the solution. In the case of the zinc salts the curve showed that the rotation of the salt itself was greater than the ionic rotation.

With alcoholic solutions very curious results were obtained, since in very concentrated solutions the sign of rotation changed, and in very dilute solutions the rotation exceeded that of aqueous solutions, showing that molecular complexities give rise to varied rotation in addition to the rotation of the salt and ionic rotation.

The following papers were taken as read: "The Action of Nitrous Acid on 1:4:2 Dibromaniline," by Prof. Meldola, F.R.S., and E. R. Andrews; "Derivatives of Succinyl and Phthalyl Dithiocarbimides," by Prof. Dixon and Dr. Doran; "A New Modification of Benzilazone," by H. Ingle, Ph.D., and H. H. Mann, B.Sc.; "Affinity of Weak Bases," by J. Walker, D.Sc., and E. Aston, B.Sc.; "Substitution-Derivatives of Urea and Thiourea," by A. E. Dixon, M.D.; "Note on some reactions of Ammonium Salts," by W. R. C. Hodgkinson, Ph.D., and N. E. Bellairs.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, May 2, Mr. H. T. Durant, Vice-President, in the chair.

The Secretary read a list of the localities which had been decided upon by the Executive Committee for botanical excursions on Saturday afternoons.

A paper was then read on—

MICHAEL FARADAY.

BY BERNARD JEALOUS.

It is, of course, impossible in a few minutes to do justice to a historical character, whether great or comparatively unimportant, and I can only hope to bring before your notice some points in the life and work of one who has done so much to advance the great branch of science with which we have to a certain extent to connect ourselves.

Michael Faraday was born in London in September, 1791, of humble parentage, and was educated in

little more than the rudiments, as we should express it, of the "three R's." At the age of thirteen he went as an errand boy to a bookseller, to whom in the next year he was apprenticed without premium in consideration—as worded in the indenture—of faithful service. Here, apparently, his scientific spirit showed itself, for we read of him constantly poring over books on science, and even attempting chemical and electrical experiments; he also occasionally attended lectures in the evenings on natural philosophy, but in this respect his financial condition seemed to be somewhat of a check.

He began near the end of his apprenticeship to write letters to his friend Abbot. This lasted for a considerable time, and on reading the earlier letters one cannot but be attracted by the correctness, ease, and style with which they are written; it is from his interesting letters written throughout his life to various people that the best account of his work is to be obtained.

The most important event, perhaps, in his life—his first acquaintance with Sir Humphry Davy—took place in 1812. He attended lectures given by Davy in Albemarle Street and took copious notes, afterwards writing them out more fully in a quarto volume. This he sent to Sir H. Davy, expressing his wish to follow up the science and asking favour on his views. The result of this was that early next year he was made laboratory assistant in the Royal Institution, with the salary of 25s. a week. Once there he commenced experimenting in earnest, some of his first operations being the extraction of sugar from the beetroot, and making a compound of sulphur and carbon. Shortly after he commenced work he was engaged with Sir H. Davy on the compounds of chlorine and azote. In his letters to his friend Abbot he speaks of the rather hard time they both had, owing to the explosive activity of these. His own account of an experiment may perhaps be of interest: "A tube was filled with dry boiled mercury and inverted in a glass also containing mercury; a portion of the compound was thrown up into it, and it was then left to act all last night. On examining it this morning the compound was gone; a substance was formed in the tube and a gas obtained. This gas was azote, the substance corrosive mercury, evidently proving it to be a compound of chlorine or oxy-muriatic acid gas and azote. On repeating the experiment this morning, as soon as it was thrown up it exploded, and the tube and the receiver were blown to pieces. I got a cut on my eyelid, and Sir Humphrey bruised his hand." He then proceeds to narrate further experiments with the compounds, which resulted in more grievous wounds, and adds somewhat significantly that he has concluded with the experiments for the present.

In October of 1813 he accompanied Sir H. Davy abroad for about eighteen months, visiting France, Italy, Switzerland, and other countries. It is scarcely necessary to mention that during the time he kept an elaborate journal, and wrote many letters. It is from this interesting record that we find in December of that year he assisted his master in experiments in

the then new substance, iodine, which resulted in the conclusion that it was an elementary body. At Florence next year they performed the experiment of burning a diamond in oxygen; heat was applied to the diamond by means of the great burning glass belonging to the Grand Duke of Tuscany; this experiment apparently went off successfully, the diamond burning with a brilliant scarlet flame.

On returning to England he went back to the Royal Institution, having a full knowledge of his master's great genius and power, and he was now about to see him engage in research work on fire-damp and flame, which resulted in the invention of the famous lamp for miners. In January, 1816, Faraday gave his first lectures, which took place before the City Philosophical Society, the subject being "On the General Properties of Matter," and the later lectures including the rarer metals, such as rhodium, osmium, tellurium, etc. A year or two afterwards he read a paper before the same society on "The Inertia of the Mind," a paper which shows that his ability was by no means confined to the realm of natural philosophy. During July, 1819, he took a walking tour in Wales. He does not appear to have met with much in the scientific line, though a little encounter he had with a would-be scientist is perhaps interesting and amusing enough to quote in his own words:—"I wanted," he says, "a little alcohol, and having found out a doctor's shop and a spruce doctor's man got some, I then asked for a little spirit of salt. He got me a stoppered bottle, and would have poured in acid, but it was not the acid I wanted, and I again mentioned spirit of salt to him, but at the same time adding muriatic acid to save his credit if possible. He now seemed to understand me, and reaching down another bottle, again prepared to pour, but I stopped him. 'It is muriatic acid that I want.' 'This is muriatic acid, sir.' 'No, that is nitric acid.' 'They are the same, sir.' 'Oh, no, there is a little difference between them, and one will not do for me as well as the other.' I then endeavoured to explain that the one came from nitre and the other from common salt. He comprehended a difference between the two bodies, but not between their acids, and he opened a pharmacopoeia at muriatic acid and uttered the Latin name and its synonyms fluently and with great emphasis, endeavouring to prove that the two were alike. I was really ashamed to correct the doctor. However, at last I made him comprehend that there was something like a difference between these acids, but I do not think he shut the book much improved by the affair."

In 1820, Faraday's work as an educated scientist may be said to have begun; but still he was only at the beginning of a much higher education, for it was not for eleven years that his first paper on "Experimental Researches in Electricity" was published. He then read before the Royal Society a paper on two new compounds of chlorine and carbon, and a new compound of iodine, carbon, and hydrogen; he also published notes of his experiments on the alloys of steel, to which at this time he paid considerable attention.

He married a year later, and it was shortly after this that he had the unpleasantness to be charged with dishonest conduct with regard to a great discovery he had made concerning electro-magnetic rotation; it was said that he had stolen the ideas and subject, and even the experiments, from Dr. Wollaston, one of the great philosophers of the time; apparently, however, all was set right by a true statement of facts. In 1823 he analysed hydrate of chlorine, acting on the suggestion of Sir H. Davy; his method of working and the results are, I think, too well known to need mentioning here. He followed this up by various experiments on the liquefaction of gases, obtaining sulphurous acid, carbonic acid gas, sulphuretted hydrogen, and nitrous oxide in the liquid state.

A little friction was caused between Faraday and Sir H. Davy over the experiment on chlorine, probably due to jealousy on the part of the latter, and the nomination of Faraday to a Fellowship of the Royal Society was strongly opposed by Davy, but on the ballot being taken there was only one black ball. The Athenæum Club was founded the same year, and Faraday was made its first secretary, but he resigned the following year as the office was incompatible with his pursuits.

He was honoured in 1825 by being appointed Director of the Laboratory at the Royal Institution, and later on as Manager, a post of considerable responsibility. One of the first acts after this new honour was to invite members to a scientific evening in his laboratory; these meetings took place nearly every week, and at them various philosophers met, and much was done to popularise the high achievements of science. His first Bakerian lecture at the Royal Society was "On the Manufacture of Glass for Optical Purposes;" he was considerably engaged in the investigation of this subject about this time and had as his assistant a man named Anderson, who was characterised by his strict obedience, obtained from his military training. His duties were to attend to the furnaces. An anecdote is recorded of him that Faraday, who was wont to release him every night, on one occasion forgot to do so, and the man was found early the next morning faithfully stoking the glowing furnace. This most laborious work did not it seems end in the desired improvement in telescopes, but the glass manufacture became afterwards of great importance to Faraday in his magnetic researches.

Although Faraday's work continued much longer, it may not be inappropriate to sum up his work to his fortieth year, which seems to have finished a particular period. He had made discoveries in electro-magnetic motion and on the liquefaction of gases, laboriously investigated alloys of steel, and worked on the manufacture of optical glass; among his chemical discoveries were two chlorides of carbon, benzol and sulpho-naphthalic acid; he also had made experiments on the diffusion of gases, a subject which was followed up by Professor Graham. These are some of the more important points in his experimental work, but it is in the subject of electricity

and magnetism that he really distinguished himself, and Tyndall speaks of him as at this time entering on a career of discovery unparalleled in the history of experimental science. Concerning this work, Faraday made the following avowal:—"I have rather been desirous of discovering new facts and new relations depending upon magneto-electric induction than of exalting the force of those already obtained, being assured that the latter would find their full development hereafter." This rather striking statement breathes the spirit that animated Faraday in his whole work. After pondering on the subject of the various electricities, he decided in favour of their identity; having established this fact, he proceeded to compare them.

He moistened bibulous paper with iodide of potassium, and subjecting it to the action of machine electricity he decomposed the iodide which formed a brown spot where the iodine was liberated; he then immersed two wires of zinc and platinum to a depth of $\frac{5}{8}$ ths of an inch in acidulated water during eight beats of his watch, and found that the needle of his galvanometer swung through the same arc and coloured his bibulous paper to the same extent as did thirty turns of his large machine. In subsequent researches on the absolute quantity of electricity associated with particles or atoms of matter, he endeavoured to give an idea of the electrical force involved in the decomposition of a single grain of water; he estimated it as such that if concentrated in a single discharge it would be equal to a very great flash of lightning; while the chemical action of a single grain of water on 4 grains of zinc would yield electricity equal in quantity to a powerful thunderstorm. His reputation in 1832 shows itself in the titles he received from societies and colleges at Philadelphia, Boston, Paris, and Copenhagen; he also received the D.C.L. from the University of Oxford. A pension was offered him in 1835 by the Prime Minister, Lord Melbourne, but Faraday refused it owing to the blunt and inconsiderate manner with which the Premier addressed him with regard to it; but on receiving a written apology and regret of his refusal he decided to accept the offer. This affair caused a little excitement at the time, as it gave rise to unnecessary controversy in the *Times* and other newspapers.

Nothing eventful in his work seems to have occurred during the next few years, though during that time he was made scientific adviser to Trinity House. In 1841 the loss of memory and giddiness, which had troubled Faraday for some time, put a stop to his work, at least for about three years. On resuming his work he experimented on some gases, and while failing in his object of solidifying oxygen and hydrogen he succeeded in getting several gases into the solid state, including ammonia, nitrous oxide, and sulphuretted hydrogen. The second period of experiments in electricity covered ten years, and during this time he discovered the magnetisation of light, magnetic condition of all matter, and atmospheric magnetism. As the discovery of the magnetization of light was such an important one, it may be worth

while to mention an experiment he made in connection with it. "A piece of his heavy glass about 2 inches square and 1/2 an inch thick, having flat and polished edges, was placed as a diamagnetic between the poles (not as yet magnetised by the electric current), so that the polarised ray should pass through its length. The glass acted as air, water, or any other substance would do and if the eye-piece were previously turned into such a position that the polarised ray was extinguished, or rather the image produced by it rendered invisible, then the introduction of the glass made no alteration in this respect. In this state of circumstances the force of the electro-magnet was developed by sending an electric current through its coils, and immediately the image of the lamp flame became visible and continued so long as the arrangement continued magnetic. On stopping the electric current, and so causing the magnetic force to cease, the light instantly disappeared." In 1853 he contributed a long letter to the *Athenæum* "On Table Moving," in which he opposed the idea of it being due to electricity, the rotation of the earth, or even to diabolical agency. This letter attracted considerable attention at the time, as it came from so high an authority.

In 1853 he was urgently asked to become President of the Royal Society, an honour which he declined, however, as he thought himself entirely unfit. The following year, through the instrumentality of Prince Albert, the Queen offered him a house at Hampton Court, where he spent the rest of his days. He continued his scientific work for the next few years, though failing health necessitated him doing less. His last day of experimental research was on March 12, 1882. His health continued to sink, and after a short period of semi-paralysis he died on August 25, 1887, at the age of seventy-six, and was buried in Highgate Cemetery.

Such is a brief and unworthy account of this great man who made such a mark on the scientific work, not only of his own time, but also on those which have to follow. The barest record of his life and work would be incomplete without at least some reference to his character. His noble qualities constantly stood out during the times of misunderstanding and open jealousy to which he like all noted men was subject. Rarely perhaps has the grace of humility, combined with ardent zeal and untiring energy, shone with such brilliance as in the case of this great and this distinguished man. It was his great earnestness, his sympathetic kindness, and unassuming courtesy which so attracted and inspired the confidence of those who had the privilege to know him. His name will hold a far from inconspicuous position on our country's roll of fame, and the record of his work will be passed down to future generations as a lasting witness to the genius of the past.

A discussion followed, in which the Chairman, Secretary, Miss Gair and Miss Buchanan (who exhibited a photograph of Faraday taken from a daguerrotype) took part.

(To be continued.)

Provincial Transactions.

DOVER CHEMISTS' ASSOCIATION.

At the usual quarterly meeting of this Association on May 15, Mr. H. Peake in the chair, the following paper was read:—

ARSENATE OF LEAD AS AN INSECTICIDE.

BY J. F. BROWN.

It was recently suggested in one of the daily papers that arsenate of lead might with advantage be substituted for Paris green as an application to fruit trees and bushes for the destruction of injurious parasites. The risk of injury to the foliage was stated to be less, and the lead compound to be more easily held in suspension while used.

One ounce in eleven or twelve gallons of water is the strength recommended. The formula for preparing the arsenate was given as 11 ounces acetate of lead to 4 ounces of arsenate of soda. This is evidently based upon the lead test for arseniate of sodium, which was introduced into the Pharmacopœia in 1885. It is there stated that 12·4 grains of the salt, dried at 300° Fahr., dissolved in water, and acidulated with acetic acid, requires not less than 34 grains of acetate of lead for complete precipitation. Some allowance for water or impurity is evident, since the quantity of acetate calculated from the equation—

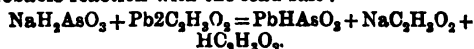


is 37·9 grains.

It occurred to me that the arsenite of lead would follow more closely the lines of the copper compounds which have been so widely used, and would be easily and cheaply prepared. To ensure the product being easily suspended in water the arsenite should be added in solution to half of the quantity used, and the lead solution to the remaining half. When mixed, a milky liquid results, which does not soon throw down a heavy precipitate.

The quantities for an ounce would be 132 grains of white arsenic dissolved in 3 fl. ozs. of solution of soda, and water to 6 ozs.; and 505 grains of acetate of lead in 6 ozs. of water. Or for 1 lb.—4 ozs. 362 grains of arsenic with 2 ozs. solid caustic soda in 1/2 gallon of water, and 18 1/2 ozs. lead acetate in the like quantity.

Whatever alkali is used to dissolve the arsenic, the combination seems loose and imperfect, and the following equation gives the simplest view of the probable reaction with the lead salt:—



Making the tenth of an ounce as an experiment, I found the precipitated arsenite, after washing and drying over a water bath, weighed 30 grains. On neutralising with solution of soda, a precipitate was thrown down which after similar treatment weighed 10·6 grains. And the filtrate continued to give a precipitate with the volumetric solution of nitrate of silver, until 300 grain measures had been added, this indicated 5·1 grains $\text{AgNO}_3 = 4·47$ grains $\text{Ag}_2\text{AsO}_3 = 3·81$ grains PbHAsO_3 , and $30 + 10·6 + 3·81 = 43·91$ grains of arsenite.

The ease with which a portion of the arsenite was retained in solution appeared an argument for its probable usefulness for the purpose in view.

Colonial Transactions.

MELBOURNE COLLEGE OF PHARMACY.

A number of gentlemen were present by invitation on Thursday, April 18, to inspect the additions to this College, the invitations including the Hon. G. Turner (the Premier), The Hon. A. Peacock (Chief Secretary and Minister of Education), the Hon. Robt. Best (Commissioner of Customs), the Hon. F. S. Grimwade, Sir James Patterson, Sir John McIntyre, the Hon. Alfred Deakin, Dr. Rothwell Adam (President of the Medical Society), Dr. Greswell (Chairman of the Board of Health), Dr. Duncan Turner (President of the Dental Board), Dr. Wm. Snowball (President of the Victorian Branch of the British Medical Association), Professor Allen, Mr. Alfred Felton, Mr. E. Zox, M.L.A., Baron Sir F. von Mueller, Dr. J. E. Nield, Mr. Joseph Bosisto, C.M.G., Mr. A. M. Topp (Under Secretary), Dr. Andrew Shields (Chief Medical Officer), Colonel Freeman, and Mr. H. J. Prockter.

The visitors were received by Mr. C. R. Blackett, Mr. Joseph George, and Mr. Shillinglaw, and shown over the building, with which they expressed their unqualified approval; adjournment was then made to the library, where luncheon was served. The chair was occupied by Mr. C. R. Blackett, President of the Pharmacy Board of Victoria, and the vice-chair by Mr. Joseph George, President of the Pharmaceutical Society of Australasia. After justice had been done to the excellent lunch provided, the Chairman read apologies from the Hon. the Premier, who was unable to be present through pressure of public business, the Hon. A. Deakin, Professor Allen, Dr. Shields, Dr. Nield, and Colonel Freeman.

The Chairman said before proposing the first toast on the list, he had, as President of the Board, been asked to make a few remarks. He had held the office of President of the Board for some years. His colleagues insisted on re-electing him every year, and therefore, he was supposed on that account to have a more thorough knowledge of the meetings of the Board than anybody else—excepting, of course, the Secretary (Mr. Shillinglaw). The object of the little reunion that day was to allow those present, and especially those gentlemen connected with public affairs, to see the work which had been done and was being done by the College of Pharmacy. Some twenty years ago their most excellent old friend, Mr. J. Bosisto—who subsequently was returned to Parliament—introduced a Pharmacy Bill which ultimately became an Act, very great assistance being given in this by Sir James McCulloch. Great authorities in Europe and America had highly approved of this Act, and the *Pharmaceutical Journal* of Great Britain of December 1, 1894, in an article on "Pharmacy at Home and Abroad," said:—"Regarding it from every point of view it will be seen that the Victorian Act is far and away the best drafted Act of any in force in English-speaking countries, and nearly approaches the ideal. The foresight and wisdom of those pharmacists who had the framing of the Victorian Pharmacy Act is fully exemplified to anyone who chooses to compare the status of the profession as it exists to-day with what it was before these worthy pioneers took the reins; for from the state of a mere trade which all classes could practise it has merged into a profession, and is recognised as such by all classes of the community, many of the pharmacists of Victoria being gentlemen who hold important public positions,

and are the recipients of social distinctions of no mean order." That coming from the highest organ of pharmacy in the British dominions was, he thought, very great praise indeed. He might say that Mr. Michael Carteighe, the President of the Pharmaceutical Society of Great Britain—a man of great ability and knowledge—had repeatedly expressed his desire to model the future amendments of the Pharmacy Act of Great Britain on that of Victoria, if the exigencies of public business would only allow of the Act at home being so remodelled. Under the Act in Victoria a student must first pass the Preliminary examination, which ensured that he had received a liberal education, just in the same way as a lawyer must pass matriculation at the University. The next stage was that the student must be articled or apprenticed for four years; and after that period, or during that period if he liked, he could attend the lectures at the College or the Ballarat or other colleges recognised by the Board, and then he must come before the Board's examiners and pass his examination in botany, materia medica, and chemistry. The final examination in pharmacy was passed before the Board, the scientific examination being by examiners specially appointed by the Board. The Pharmacy Board had to look after the administration of the Pharmacy Act and of the Poisons Act. It was most important that the Poisons Act should be administered faithfully. He thought they had succeeded in overcoming difficulties which would disappear as the public became more enlightened on those matters. In the celebrated case of Mrs. Needle, the Richmond poisoner, last year, the importance of the Poisons Act came out very strongly. Had it not been for the strict registration regulating the sale of poisons it was quite possible the charge in that case would never have been so perfectly brought home.

To go into all those points would occupy more time than could be spared on that occasion, but he would like to point out that the Pharmacy Board and the Pharmaceutical Society undertook double functions. The Pharmaceutical Society was a voluntary association which looked after pharmaceutical education in Victoria. The Society saw to the enrolment of students, saw that the students were properly educated, appointed lecturers and the teaching staff, and then the students had to be accepted and finally examined by the Pharmacy Board. The results of the work done by the Society in the last fifteen or twenty years had been most satisfactory. The members of the Society and of the Board were actuated by but one desire—to advance in every possible way pharmaceutical education in Victoria. What would be the use of highly educated medical practitioners with university training if pharmacists who dispensed their prescriptions were not equally well educated in the science of the day? Chemistry was a very large and most important branch of study, no one head contained all that was known or implied in the words chemical science. A man might have a general idea of chemistry, and a very firm, clear grasp of it, but to succeed he must more or less devote himself to special branches of the science. It was important to have highly educated pharmacists in order that the medical profession might be supported. That was self-evident. Botany which was so well taught in that College, was most important in a new country, where they had so many plants still unknown and uninvestigated, notwithstanding the labours of Baron von Mueller, who had done wonders in the way of adding to the knowledge of the flora of Australia and Victoria. If the students from that College who went into different parts of the colony could become centres for the diffusion of scientific and industrial knowledge, instead of devoting themselves to football and cricket, it would add greatly to the convenience and welfare

of the people. Then there was a large number of medical students in the College, and they were progressing very satisfactorily. He might now mention that from 1880 to 1894 some 984 students had come up for the Preliminary examination. In chemistry, materia medica, and botany 595 students had presented themselves for examination in the same period. The College lectures, from 1883 to 1894, had been attended by 496 students (for the full course), and 290 students from the Melbourne University had attended the pharmacy course, and in the period from 1880 to 1894 some 412 persons had entered in articles of apprenticeship. He might refer to one other point. They had provision there for the thorough teaching of the technical branches of chemistry. A soap boiler, a brewer, or a candle maker, or any other person who wished to study the science which underlay his business, could come to the College and receive a training in that science. The College, he believed, might be made a most important centre for the education of the people of this colony, and nothing could be of more importance than that brewers, vignerons, and people connected with any industry should have a complete scientific knowledge of the various chemical stages in those industries. That he considered a most important point, and he hoped that in this respect the College would go on and improve. "Rest and be thankful" was the motto at the College, and he trusted the efforts made would receive the approbation of the people, and of the Government of Victoria, which had always liberally regarded scientific institutions. He trusted that the College would continue to merit that confidence, and act in every possible way in accord with the highest ideals in matters educational.

The toast of the Queen having been duly honoured, The Chairman proposed, "Her Majesty's Government in Victoria—Our present Ministry."

Mr. Peacock responded. He said they were not there to discuss politics, but for an entirely different purpose—to discuss matters educational. The representatives of the Government, as well as the representatives of the Opposition, had come there for the purpose of seeing something of the work which had been done for so many years by that Association. He had to express his gratification at the practical, sensible speech they had just heard from the Chairman, a speech which he (Mr. Peacock) was sure would be read with delight by those who were not fully acquainted with the work of the Society. He had further to say that he was extremely gratified at the information which had been given them as to the work done there. There was only one point to which he would like to refer, although it was a point on which some other gentleman present might wish to bring forward. It appeared to him as a young student, in this his native country, in view of all that had at times been said in reference to the multiplication of channels for one kind of work, that perhaps it was a pity there had been such a duplication of work in regard to this particular science. The natural question arose why there should be this duplication—why the work could not be done by the University, and a saving of expense thus brought about? That was the first point which occurred to his mind. He found they were proposing to establish a Dental College, and there were different other scientific institutions, all of which with less expense might be managed from one centre. It was possible, however, that this point might be explained and the objection he had suggested removed. He must express his delight as a member of the Government at being present on this occasion. He knew full well what an immense amount of work had been done, and it would be far better if the young men took advantage

of such institutions, instead of devoting so much of their time, as in the past, to sports. As to the College being a centre of learning for the different country districts, Sir John McIntyre had on a former occasion pointed out the desirability of such a state of things, and he (Mr. Peacock) was sure that if the idea just suggested by the Chairman were carried out it would be productive of immense good to the rising generation. He had much pleasure in responding to the toast on behalf of the Government, and regretted that the Premier and others of his colleagues were not present.

Mr. Best also responded on behalf of the Government. He said he had much pleasure in being present to witness what had been done by that very important Society, and to inspect the magnificent additions which had been made to the buildings. Old times came back to him when he observed the metamorphosis which had taken place in that building, once the scene of so many legal fights. It was gratifying to find the old building turned to its present magnificent purposes. Members of the Government attended that opening ceremony with a degree of light-heartedness when they knew that the object of the gathering was not the asking of further government assistance. That was specially impressed on the Ministers as one of the chief reasons why they should be present that day. The institution was subsidised—and most wisely subsidised—to the extent of £900 a year, and no extra assistance was asked. He observed with pleasure the advance made by the Society in the great science of chemistry, and in the spreading of practical pharmaceutical knowledge. He was struck, just as his colleague (Mr. Peacock) had been struck, with the idea that there perhaps might, with some considerable advantage, be some affiliation with the University. They must, however, recognise the statutory bond, the Society having been founded under Act of Parliament and having an ascertained statutory constitution. Under these circumstances the Government was called on to aid in every way in the development of that very important work. It was recognised that the education in pharmacy given there was equal to any given elsewhere in the world; indeed, he was aware that the education given there surpassed that of some other countries. He was glad that was so. In that country they had advanced education and had some of the highest educational standards that were required; and under those circumstances they might expect—considering the provision made by that and similar institutions—to get the best men into those various professions. He hoped that that institution would play a great part in the history of the community. When they bore in mind how enormously the health of the public generally depended on the efficiency and skill of those engaged in the compounding of drugs, it was essential that the best education should be given, that none but the best men should be authorised to dispense those drugs, and that the best possible supervision should be exercised as to the quality of those drugs. All this came within the jurisdiction of the College and of the Board, and when they observed the men who had the management of that institution, the public must feel reliance that they were perfectly protected. He was gratified to hear of the work being performed by that institution, and could only hope that prosperity would attend it, and that the expenditure on the new building would be more than justified by the results.

Mr. J. George proposed "The Parliament of Victoria." So far as their institution was concerned, it had nothing to complain of in regard to parliaments of the past, and he thought it had nothing to fear from parliaments of the future. Parliament seemed to be aware of the great work which was being done

by that institution, particularly in connection with the education of the rising generation in the colony.

Mr. F. S. Grimwade, M.L.C., responded on behalf of the Legislative Council. He was quite sure the Upper House would do what was expected of it; and he believed—although it was only a matter of opinion—that there never was a time in the history of the country when the Legislative Council stood in better repute or was more thought of than at the present time. The present Government had a most arduous task before it, and if it tried its best to square the finances, he was sure it would receive the hearty support of the Legislative Council.

Mr. E. L. Zox, M.L.A., responded on behalf of the Legislative Assembly. He desired to add his meed of praise to that institution, and was proud to represent a district which had such an institution in its midst.

Sir John M'Intyre, M.L.A., also responded. He pointed out that no medical student could pass without having the certificate of the College of Pharmacy, so that while the institution was not a portion of the University it worked in the same way as the latter. In Scotland, such institutions were part of the University, and all his certificates were from the University; and the position was, as he pointed out, nearly the same in Victoria. Perhaps if the work were being done by the University, the latter would be asking for £5000 more from the Government. Both Ministers present recognised the value of the work which was being done, and the institution now had a building which was a credit to themselves and to the colony. Mr. Blackett had omitted to tell them that so far as the members of the Pharmacy Board were concerned, the whole of the work for nearly twenty years past had been entirely honorary.

Sir James Patterson proposed "The Medical Profession." He took the opportunity to point to the great scientific labours of Baron von Mueller, who was with them that day, and was the highest botanical scientific authority in the world. To Mr. Bosisto, who was also present, they were largely indebted for the Pharmacy Act, and in this work their Chairman had also taken a leading part. The medical profession was the highest and most honourable of all. The professional nurses were now of such a class and so highly qualified that it was a delight to see them in a house where sickness was. He had the utmost reverence and respect for the medical profession as a whole. It has been said that institutions should be connected with the University, but it was suggested by practical men that that being an independent branch of the profession, it could be more conveniently managed where it was. At all events, it had been doing its work very well in the past, as the practical address of the Chairman informed them. It was of the greatest importance to the community that in these matters it should not be guided by ignorance, which was a curse to whatever branch of life it was found in connection with.

Dr. Duncan Turner responded. He said he had noticed every year a marked improvement in pharmacy in the colony. When he first came to Victoria, about twenty years ago, he found a number of chemists he would not entrust his prescriptions to. Every year, however, those men were getting fewer and fewer, and a better race of educated chemists was rising every year. It had been stated several times that the Board should be allied to the University. The Board had a grant of about £900 a year, and it was managed on the most economical lines. If it were allied to the University the cost would, he fancied, be more like £5,000 a year. He did not wish to be hard on the University, but he thought it was rather an extravagant institution. In his opinion the Pharmacy

Board had done better work for less money than the University would require.

Mr. F. S. Grimwade proposed "The Pharmacy Board and the Pharmaceutical Society and College." In the speeches which had been made there had been ample evidence as to the work the Pharmacy Board and College had done. The members of the Pharmacy Board for nearly twenty years had worked without fee or reward. The chief secretary had raised the point as to whether it would not be better to have the teaching part of the institution allied with the University. When the Pharmacy Act was passed, the Pharmacy Board took on themselves the responsibility of providing the necessary teaching for the students. The Pharmacy Board was for some two years in communication with the University authorities to ascertain whether they would provide accommodation for lecturers and take charge generally of the teaching of this particular branch of science. After two years' consideration the University authorities said they did not see their way clear to provide lecturers or give accommodation for lecturers. The Pharmaceutical Society therefore had to undertake the provision of the school, and of the fact that the Society had done the work well, enough had been said. There was no doubt the teaching there was as good as any in the world. It was forty years since he was apprenticed, and in that time he had had a good deal of experience. Ten years ago he had the honour of meeting the President of the Pharmaceutical Society of Great Britain and of visiting that institution several times. He had also had an opportunity of visiting the similar institutions of Philadelphia, Ohio, and Canada; and the teaching provided at the school here in Victoria was, as he had said, as good as any in the world. And it had to be borne in mind that this teaching had only cost the Government for six years the sum of £900 a year. Had the school been allied to the University he had no doubt the teaching would have cost a great deal more than the sum he had mentioned. No one in Victoria had seen more of assistants, both of this and other countries, than he had, and he unhesitatingly said that the young men training here were men of whom any country might well be proud. There was every reason to be proud of the College of Pharmacy. They would know he was speaking from experience when he told them that his sons were trained in the College.

The President responded. The new buildings were, he said, to a certain extent erected out of savings on the part of the Pharmaceutical Society; not a single penny had been asked from the Government towards the buildings. They had been forced to enlarge the laboratories in consequence of the increasing number of students who came from New South Wales, Tasmania, South Australia, Queensland, and even from Fiji.

Mr. J. Bosisto also responded. He was glad that the new buildings had been necessitated by the increasing number of students, and he must admit that he felt a little bit proud of the position which the institution now occupied. From 1874 to 1876 he and his brother pharmacists worked together with a view of bringing in a Pharmacy Bill which should be equalled by none in the whole world, and the present Act was recognised by authorities at home as a credit to the Parliament of this country. When he went to England in 1886 he had to address the Pharmaceutical Society, showing the differences of the vegetation of Great Britain and Australia, and as an old man he might be permitted to say that they were so struck with the observations he then made that he was now an honorary member of the Pharmaceutical Society of Great Britain. The present system of pharmacy teaching in Victoria was only equalled by

the highest educational establishments of Europe, and the best endeavour had been made to teach their young people the value and importance of a thorough education in pharmacy—an education equal to that of any school in the world. The greatest fault he as an examiner had to find with the students here was that, while perhaps astonishingly perfect at examination, they, in a great many instances, made no effort to exercise their talents in further educating themselves once they had got their certificate. That was to be very deeply regretted, for in that really grand country there were a great number of plants containing properties of immense value awaiting investigation.

The proceedings then terminated.

Proceedings under the Pharmacy Act.

THE PHARMACEUTICAL SOCIETY v. ARMITAGE.

In this case, which came before His Honour Judge Bacon, at the Bloomsbury County Court, on Thursday, May 23, the Pharmaceutical Society sued John Story Armitage, carrying on business as a chemist at No. 1, Colva Street, South Highgate, for two penalties of £5 each, for having on two separate occasions sold a scheduled poison, he not being qualified to do so within the provisions of 81 and 82 Vic. c. 121.

Mr. Grey appeared as Counsel for the Society and stated that the articles sold by the defendant in this case were Powell's balsam of aniseed and Dr. Collis Browne's chlorodyne, which both contained morphine.

Mrs. Partridge proved the purchase by her on February 20 of a bottle of Powell's balsam of aniseed from the defendant's wife, Mrs. Armitage, and on the 23rd she was served by the defendant with a bottle of Collis Browne's chlorodyne.

Mr. Partridge, husband of the previous witness, deposed to having gone to the defendant's shop in January last, when he tried to purchase a bottle of chlorodyne, but the defendant declined to serve him, although he (witness) saw some bottles in the shop.

Mr. E. J. Eastes, analytical chemist, said he had analysed the two bottles in question. The bottle of Powell's balsam of aniseed contained a fluid ounce, which on analysing he found to contain .27 of a grain of morphine. The bottle of chlorodyne contained 1 grain of morphine.

Mr. Daldy, who appeared as counsel for the defence, called

Mr. Armitage, who said he had a Wisconsin Medical Degree, besides which he was a Licentiate of the Royal College of Dental Surgeons, Dublin, an Associate of the Society of Apothecaries, London, and a Member of the United Society of Chemists. He was not qualified under the Pharmacy Act. He denied that he had for over two years sold, or kept for sale, Collis Browne's chlorodyne. Neither of the bottles produced by Mrs. Partridge came from his shop.

Cross-examined: His shop was called a doctor's shop. He was away from it the greater part of the day, being a dispenser at a hospital. When Mr. Partridge came to his shop he had not a bottle of chlorodyne in the place, though he believed he had an empty bottle, the contents of which he had used himself when ill. He had "dummy" chlorodyne bottles in his case.

Mrs. Armitage was then called, and said she was a certified midwife. She denied having sold a bottle of Powell's balsam, as alleged by Mrs. Partridge.

Mr. Daldy said it was purely a question of whether the articles had been sold by the defendants as alleged or not, and it would be for his Honour to say which side he believed. His other point was that section 15 did not impose a penalty for an isolated sale. The language of the section seemed to require something more than that. The words of the section were: "From and after the 31st day of December, 1868, any person who shall sell, or keep an open shop for the retailing, dispensing, or compounding poisons," which clearly pointed to a systematic procedure.

His Honour: Do you mean that he must sell both arsenic and prussic acid before he makes himself liable to a penalty?

Mr. Daldy said if the words were "shall sell any article of poison" the matter would be beyond a doubt; but when the words were "any person who shall sell poisons," that referred to a practice of selling poisons.

His Honour, in giving judgment, said there was no difficulty in it, though, no doubt, the point raised was a very ingenious one. It was clear to his mind that the articles in question did contain poison. He was also satisfied upon the evidence that the two sales were effected, though he had great doubt whether it was judicious on the part of the Pharmaceutical Society to employ people to go about and get up evidence; still they might say that, having got this Act, what they did was for the protection of the public. The defendant's explanation of the presence of a bottle of chlorodyne in his shop, which he admitted, was a very lame one. There would be judgment against the defendants for two penalties and costs.

THE PHARMACEUTICAL SOCIETY v. HILLS.

In this case, the defendant, Mrs. Lavinia Hills carries on business at 91, Lower Marsh, Lambeth. The Pharmaceutical Society sued for one penalty in respect of a sale of Powell's balsam of aniseed on February 25 last. In answer to the usual letter from the Society's solicitor a letter was received stating that the business was conducted by a Mr. W. M. Thompson. Mrs. Hills wrote on March 15 saying that she was a widow and promising to get a qualified assistant. Mr. Grey contended that unless Mrs. Hills was herself properly qualified she could not keep open shop for the sale of poisons.

Mr. Ray, solicitor, who appeared for the defence, said Mr. Thompson was a qualified apothecary, and cited section 16 of the Act, under which he submitted that the executor of a deceased chemist was entitled to carry on the business under the management of a legally qualified chemist.

After some discussion the further hearing was adjourned to June 20 for the defendant to produce evidence as to the qualification of the late Mr. Hills.

THE PHARMACEUTICAL SOCIETY v. HOGG.

In this case the defendant, J. A. Hogg, who carries on business at 45, Walworth Road, S.E., as a manufacturer, did not appear.

Mr. Partridge proved the purchase on December 15 from the defendant of a packet of rat and mouse poison called Hogg's "Rhodentium."

Mr. E. J. Eastes deposed to having analysed the article in question, which he said contained 52 per cent. of arsenic. In the whole packet there was 250 grains of arsenic.

Mr. Grey put in the Register of the Pharmaceutical Society to show that the defendant was unqualified.

His Honour gave judgment for the penalty of £5, and costs.

Reviews and Notices of Books.

THE MEDICAL ANNUAL AND PRACTITIONER'S INDEX FOR 1895. Pp. 626. Price 7s. 6d. (John Wright and Co., Bristol.)

This, the thirteenth issue of a well-known year-book, will bear favourable comparison with its predecessors. The publishers have been successful in maintaining the peculiarity by which it is distinguished from similar works; this consists in devoting many pages to the consideration of particular subjects, in addition to the questions which have been more especially under consideration in the past year. Of these, "Eyesight and School Life," by Mr. Simeon Snell; "Infantile Paralysis," by Mr. Robert Jones, of Liverpool, and Dr. John Redlon, of Chicago; and "Doubling of the Uterus," by Mr. John Taylor, of Birmingham, deserve especial attention.

The book abounds with information relating to improvements in medicine and surgery, including therapeutics and pharmacy. New remedies, new books, new instruments, etc., are judiciously considered. The latest information in regard to diphtheria and antitoxin is furnished by Dr. Ruffer. The 'Medical Annual' is in every respect an admirable book, and invaluable to practitioners of medicine.

British Pharmaceutical Conference.

A meeting of the Executive Committee was held at 17, Bloomsbury Square, on Wednesday, May 22.

Present:—Mr. N. H. Martin (President), Messrs. Atkins, Attfield, Cartelghe, and Toone (Vice-Presidents), Mr. John Moss (Treasurer), Messrs. Holmes, Bird, Mathews, and Farr; Mr. Hardwick (Hon. Local Sec.), Messrs. Naylor and Ransom (Hon. Gen. Secs.), and J. C. Nightingale (Asst. Sec.).

Letters of regret for non-attendance were received from Messrs. Hayes, Groves, Ewing, Wells, Boa, and Bridge.

The minutes of the previous meeting were read and confirmed. Messrs. Toone and Hardwick, as a deputation from the Local Committee, presented an outline of the suggested arrangements in connection with the forthcoming meeting of the Conference at Bournemouth. The reception by the President is to be held at the Hotel Mont Doré, on the evening of Monday, July 29. That hotel is to be the headquarters of the Conference, and accommodation will be there provided for a considerable number of members attending the meeting. The President will deliver his address in Shaftesbury Hall on the Tuesday morning, and this will be followed by the reading and discussion of papers. Luncheon will be provided at the Hotel Mont Doré. At the conclusion of the business in the afternoon it is intended to take a steamboat excursion to Swanage, from the neighbourhood of which very fine coast views are to be obtained. The reading of papers and official business of the Conference will be concluded on the Wednesday afternoon. The usual smoking concert and ladies drawing-room

will be held at the hotel during the evening. The following day will be devoted to an excursion by coaches to Christchurch, and thence through the most beautiful parts of the New Forest. Luncheon will be provided in the neighbourhood of Lyndhurst, and the return journey will be *via* Ringwood.

In accepting the suggested programme, a vote of thanks was passed to Messrs Hardwick and Toone for their kindness in coming from Bournemouth to lay the above proposals before the Committee.

Some discussion took place with regard to the form of the usual white circular issued to members, and the Secretaries were authorised to make any alterations that they might consider desirable.

Thirteen gentlemen having been duly nominated were elected to membership.

Correspondence.

[*Letters should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.*]

THE RESEARCH LABORATORY.

Sir,—I cannot refrain from expressing my opinion that the Pharmaceutical Society is very much indebted to Mr. Butt for directing the attention of its members to the doings at the Research Laboratory; it is unfortunate that the Council should have permitted the Director of that Laboratory to prosecute chemical researches which are of so little value to pharmacy and medicine, at the expense of the Society. Surely there are subjects enough to be found for research which might be of use in medicine. The Blue List just issued by the British Pharmaceutical Conference contains no less than sixty-three subjects which require investigation, many of them have appeared yearly for some time past, therefore there should have been no difficulty on the part of the Director of the Research Laboratory in selecting appropriate subjects for investigation, the results of which could have been read and discussed before the Conference, or in the theatre of the Society.

1, Trevor Terrace, S.W.

J. B. BARNES.

THE COUNCIL ELECTION.

Sir,—After perusing the scrutineers' report upon the recent Council election, I cannot forbear remarking upon the apathy displayed by the members of the Society generally, 46 per cent. not taking the trouble to vote. Is it the railers against the Society who neglect to exercise their franchise? If so, how large a number they represent; if friends, surely a little interest might be taken to assist in obtaining a good working representative Council to uphold the interests of the trade for the entire kingdom. At present the Council is composed of London members and from the southern portion of the kingdom. Yorkshire and Lancashire, with their large populations, send only one representative each. Westmoreland and Cumberland have no representative; the former county has never had one during the whole period of the Society's existence. It would be an interesting subject for publication to acquaint us how it comes to pass that 1 per cent. of the voters (I do not ask for their names) were unable to fill up their papers correctly. It might possibly help to prevent such a deplorable occurrence in future.

Harrogate.

R. HAYTON DAVIS.

Notes and News.

EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.—The Committee of this Association has arranged the programme of the picnic to be held at Kinross, on Wednesday, June 12. The party will proceed by rail to Perth, where carriages will be ready to convey the company through part of the city, and thence by the Bridge of Earn and Glen Farg to Kinross. Dinner will be served on arrival at the Green Hotel, and two hours will afterwards be available for visiting the interesting sights in the locality, including Loch Leven and the Island of St. Serf, where the ruins of a monastery founded by St. Servanus, one of the disciples of St. Columba, are still to be seen. The prices of the tickets will be the same as last year, viz.:—double ticket, £1 3s.; single ticket, 12s. 6d., and the Committee has arranged for the issue of tickets for juveniles at 6s. each, which may be had from the Honorary Secretary, Mr. Claude F. Henry, 1, Brandon Terrace, Edinburgh. Any members or friends of the craft who may be visiting the neighbourhood will be heartily welcomed at the picnic.

R. H. DAVIES' FUND.—The balance-sheet in connection with this Fund has now been duly audited by Mr. Michael Carteighe, and shows that the sum of £750 11s. was received from subscribers. Of this amount the Committee has invested £700 with the Sun Life Office for the purchase of a certain annuity of £61 12s. for fourteen years. The proceeds will be devoted for the benefit of the children of the late R. H. Davies, and Messrs. E. J. Bevan and Wm. Chat-taway are acting as trustees. Expenses have absorbed £41 8s. 2d., and the cash in hand and at the bankers amounts to £9 2s. 10d.

PRESCRIBING BY CHEMISTS.—Dr. Wynn Westcott, the Coroner for North-East London, has been interviewed by the *Echo* on the subject of prescribing by chemists, and is reported as saying that, although the drugs given by chemists may not be harmful in themselves, they do harm, nevertheless, for they lead to a delay in obtaining correct diagnosis and proper treatment. Another thing that he thinks does still more harm than prescribing by chemists, is the habit they have of recommending patent medicines. Dr. Westcott admits that it would be impracticable to compulsorily suppress these unorthodox methods of doctoring, and chiefly hopes for improvement from educating public opinion on the matter. "What we must convince parents is," he said, "that for them to go to a chemist for advice when one of their children is ill is to defeat their own purpose by delaying a proper diagnosis, and, therefore, a correct treatment."

INSTITUTE OF FRANCE.—In connection with the celebration of the centenary of the Institute of France, in October next, there will be a reception of foreign representatives by the Minister of Education, in addition to a banquet, a dramatic entertainment, and a reception at the Elysée by the President of the French Republic.

DIPHTHERITIC ANTITOXIN IN BAVARIA.—According to the *Pharmaceutische Zeitung*, out of 143 authoritatively recorded cases of diphtheria in Bavaria, in which antitoxin serum has been used, 14 ended fatally.

STATUE TO LAVOISIER IN PARIS.—An international appeal for subscriptions is about to be made by the Institute of France, for the purpose of erecting a statue to Lavoisier. Subscriptions may be sent to 55, quai des Grands Augustins, Paris, addressed to the Treasurer of the Lavoisier Memorial Committee.

GERMAN ENTERPRISE.—Capelle, of Berlin, is the author of the book '*Englische Apotheken Praxis*,' the purpose of which is to assist the German pharmacist, especially those residing at watering places and popular health resorts, in gaining the patronage of British visitors. Recipes are given for preparing the various draughts so popular with English people, and our patent medicines are dealt with, as well as British homœopathy. The author holds that one or more of the assistants should be acquainted with the English language, and recommends the keeping of English newspapers for use of the customers. There is no doubt, states the *Pharmaceutische Centralhalle*, that these small attentions go far in inspiring the customer with a certain amount of confidence towards the pharmacist.

CHEMISTS' TRADE PROTECTION SOCIETIES.—A correspondent of the *Birmingham Daily Post* remarks that it seems inexplicable to him that such an intelligent body as the retail chemists do not combine to protect themselves against the starting of the large popular-price drug stores, which occur with a frequency that must be taking the bread out of their mouths. In order to cope with the demand of modern times—viz., to buy at lowest price for cash—it is suggested that chemists might amongst them establish a buying syndicate, to which all their combined orders would be given, thus enabling them to buy in large quantities for cash and compete with the stores. It is thought that the expense of working such a syndicate would be very little, whilst the advantages are too apparent to need comment. They might also, he observes, manufacture many drugs, and get the manufacturers', wholesalers', and retailers' profits.

POISONING BY EXALGINE.—A writer in the *Lancet* reports a case of poisoning by five grains of exalgine, administered to a woman (30) suffering from severe asthma and consequent insomnia. The effects were experienced within five minutes, the patient becoming perfectly stiff and unconscious. Recovery was effected with considerable difficulty, and attention is drawn to the evident danger of administering exalgine—a respiratory poison—to asthmatics, even in moderate doses.

THE B.P. AND NEW ORGANIC REMEDIES.—Messrs. Helbing and Passmore have followed up their suggestions for future pharmacopœial requirements of essential oils, by dealing with new organic remedies on similar lines, the results of their work being published in pamphlet form.

PATENTS, DESIGNS, AND TRADE MARKS IN 1894.—

During the past year, 25,386 patents were applied for, being 270 more than the previous year. Two per cent. only were by women; 21,230 designs were registered, and 1025 sets of designs, as compared with 19,174 and 306 respectively in 1893, whilst 1606 applications for registration were objected to by the Comptroller on the ground of similarity to designs already registered, want of subject matter, or want of novelty. Eighty-three of these were accepted later without alteration, forty-seven after modification, and sixty-eight allowed to proceed after correspondence. There were also 8013 applications for the registration of trade marks, as compared with 8675 in 1893. The gross receipts of the Patent Office for 1894 amounted to £181,855, and the gross expenditure to £96,092.

THE JAPANESE MONOPOLY OF CAMPHOR.—The *Spectator* remarks that it is a curious incident of the cession of Formosa, that it directly affects every druggist in Europe, since camphor is produced only in Japan and Formosa. The Japanese, knowing that, have limited and taxed its export, and the price of the article is going up by leaps and bounds. Like all drugs that are greatly wanted, our contemporary points out, camphor will bear a high price and great fluctuations in its value; "but if the Japanese push their advantage too far, science will avenge herself and provide a substitute. There is a substitute for everything somewhere, even for quinine, and greediness in selling, if pushed beyond a certain point, always ensures its production."

LIFE AND WORK IN EGYPT.—Dr. D. Harvey Attfield, M.A., Cantab, quarantine medical officer at Suez and Moses' Wells, and sub-director of the Mecca pilgrim encampment at El Tor, has completed his first year's service in Egypt, and records his experience in his journal, which has been printed for private circulation amongst friends. Naturally, the book is chiefly occupied with the minor details of every-day life, but this is every-day life in Egypt, and therefore of more than ordinary interest to stay-at-home folk. The general impression left on the mind of the reader is that work in Egypt savours strongly of play, but then, of course, a private journal must not be regarded as a record of professional duties performed. A serious turn is given to the book by including as appendices reprints of Dr. D. H. Attfield's papers "On a Solidified Glauber's Salt Lake," and "On Water Purification by Infusion."

CURIOUS WINDOW ATTRACTION.—American pharmacists do not invariably depend upon their scientific attainments for a livelihood, any more than do their English brethren, and occasionally they even stoop to attract a crowd, as witness the following from the *Alumni Report* of the Philadelphia College of Pharmacy:—"A. A. Kroeg, '78, had in his show window, at his store, Charlestown, S.C., a wild racoon, which attracted much attention. It broke its chain, however, and did considerable damage."

English News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

IMPORTANT DECISION WITH REGARD TO "ONE-MAN" COMPANIES.—A very important judgment was pronounced on Tuesday last in the Court of Appeal, which may possibly have more far-reaching results than were present even to the minds of the learned Lords Justices themselves; results in which chemists and druggists as a body are more or less directly interested, though the business out of which the transactions in question arose was of a very different character. A few extracts from the judgment will fully justify this statement, and it is only necessary to add by way of introduction that the case was very fully argued about a fortnight ago by the most able counsel at the equity Bar, and that each judge has delivered a carefully considered written judgment.

The case appeared in the list as *Broderip v. Salomon*, and Lord Justice Lindley, in beginning his judgment, said: "This is an appeal by Mr. Aaron Salomon against an order made by Mr. Justice Vaughan Williams, which, in effect, directs Mr. A. Salomon to indemnify a limited company formed by him against the unsecured debts and liabilities incurred by or in the name of the company whilst it carried on business. The appeal raises a question of very great importance, not only to the persons immediately affected by the decision, but also to a large number of persons who form what are called 'one-man companies.' Such companies were unheard of until a comparatively recent period, but have become very common of late years." The Lord Justice then went through the facts of the case, and having detailed how Mr. Salomon—who was a leather merchant and wholesale bootmaker—sold his business with all necessary formalities to a company, of which the sole members were himself, his wife, daughter, and four sons, continued: "I proceed to examine the legal aspect of this case, which, as I have said, is one of great general importance. There can be no doubt that in this case an attempt has been made to use the machinery of the Companies Act, 1862, for a purpose for which it never was intended. The Legislature contemplated the encouragement of trade by enabling a comparatively small number of persons—viz., not less than seven—to carry on business with a limited joint stock or capital, and without risk or liability beyond the extent of such joint stock or capital, but the Legislature never contemplated an extension of limited liability to a sole trader or to a fewer number than seven." Again, "although in the present case there were and are, seven members, yet it is manifest that six of them are members simply in order to enable the seventh to himself carry on business with limited liability, and the object of the whole arrangement is to do the very thing which the Legislature intended not to be done, and ingenious as the scheme is, it cannot have the effect desired so long as the law remains unaltered. The incorporation of the company cannot be disputed; that follows from section 18 of the Companies Act, 1862. Whether by any proceedings in the nature of a *scire facias* the Court would set aside the certificate of incorporation has never been considered, and on which I express no opinion, but be that as it may, in such an action as this the validity of the certificate cannot be impeached. The company must therefore be regarded as a corporation, but as a corporation created for an

illegitimate purpose." His lordship concluded his judgment by stating the form of the order, which would be made as follows:—"This Court being of opinion that the formation of the company, the agreement of August, 1892, and the issue of debentures to Aaron Salomon pursuant to such agreement, were a mere scheme to enable him to carry on business in the name of the company with limited liability, contrary to the true intent and meaning of the Companies Act, 1862, and further, to enable him to obtain preference over other creditors of the company, dismisses the appeal of Aaron Salomon with costs."

Lord Justice Lopes in the course of his judgment said: "It never was intended that a company should be constituted to consist of one substantial person and six mere dummies and nominees of that person without any real interest in the company"; and, a little further on, "To legalise such a transaction would be a scandal." He concluded by saying that he was inclined to think that on a *scire facias* the incorporation of the company might be set aside, but he would express no decided opinion on that point.

Lord Justice Kay, in the course of a lengthy judgment, said "the Statutes were intended to allow seven or more persons, *bond fide* associated for the purpose of trade, to limit their liability under certain conditions and become a corporation, but they were not intended to legalise a pretended association for the purpose of enabling an individual to carry on his own business with limited liability in the name of a joint stock company."

It will no doubt be observed from the above quotations that the learned judges were dealing only—as they were alone called upon to deal—with pecuniary considerations, on the one hand the motive operating on the individual trader in seeking to obtain the advantages of the Companies Acts for his own pecuniary benefit, and on the other the injustice to which creditors of the company would be exposed if such transactions were upheld. But there are in some peculiar cases certain advantages of a totally different kind attaching to registration under the Companies Acts, and the language of the learned Lords Justices above cited would seem to indicate a strong probability at any rate that where such advantages are in the circumstances illegitimate, means may be found, even in the present state of the law, for setting aside the registration.

NOTTINGHAM AND NOTTS CHEMISTS' ASSOCIATION.

—The annual meeting of this Association was held at the Masonic Hall, Nottingham, on Wednesday, May 22, when the members turned up in good numbers. The chair was occupied by Mr. Councillor FitzHugh, J.P. From the report it appears that the numerical position of the Association has been improved during the year, and now stands at fifty members and thirty-four associates. An effort was made at the commencement of the session to arrange meetings for members, but the response was so poor that they had to be abandoned. The educational work has, however, been more prosperous, the arrangements with the University College being on a very satisfactory basis. The botany class, conducted by Professor Carr, M.A., was attended by twenty-nine students in the first two terms, with an average attendance of 83 per cent., and the third term is being attended by twenty students.

The dispensing class, conducted by Mr. F. R. Sergeant, has also been very successful. More students applied for admission than could be accommodated, and the average attendance was 93 per cent. At the examination the following obtained prizes:—Messrs. E. Richardson, W. A. Cooling, and Whitchurch, who respectively obtained 90, 80 and 70 per cent. of the total number of marks obtainable. During the year the following associates have passed the Pharmaceu-

tical examinations:—Major: Messrs. H. Dyson and Cecil Massey. Minor: Messrs. H. G. Boyce, H. G. Jennings, Cecil Massey, and A. H. Wood.

The Treasurer's account showed a balance in hand of over £30.

A hearty vote of thanks was accorded to Mr. Sergeant for his invaluable services as teacher of the dispensing class, and a similar compliment was paid to Mr. W. Gill, who is resigning the secretaryship after holding the office for five years.

The following were elected to office for the ensuing year: President, Mr. Councillor FitzHugh, J.P.; Vice-President, Mr. T. Mason; Treasurer, Mr. J. Wilford; Honorary Secretary, Mr. A. Eberlin.

Council: Messrs. A. E. Bellby, R. H. Beverley, C. A. Bolton, W. Gill, A. Middleton, J. Radford, F. R. Sergeant, and R. Widdowsqn.

Auditors: Messrs. W. H. Parker and E. Gascoyne.

A cordial vote of thanks was passed to Mr. FitzHugh for his services as President.

An alteration was made in the Rules, reducing members' subscriptions to 5s. per year.

Mr. F. Lumley introduced a discussion on the Shops Early-Closing Bill, but owing to the late hour the matter was adjourned till the next meeting.

Scotch News.

—EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.—The Committee of this Association has arranged Botanical Excursions to be held as follows:—

Date.	Place.	Meet at.	Time.
1895.			
June 5	Blackford Hill	Blackford Hill Stn.	8.30 p.m.
" 26	Colinton Dell	Caledonian Station	8.30 p.m.
July 15	Inveresk	Waverley Station	By Rail *

* 8.15 p.m. Train to Inveresk.

The Committee has also arranged Summer Meetings to be held at 36, York Place, Edinburgh, as follows:—

Date.	Time.	Time of Demonstration.
1895.		
June 19...	8.30 to 10 p.m.	9.15 p.m.
July 15 ...	8.30 to 10 p.m.	9.15 p.m.

These meetings will be devoted to examination of, and demonstration on, plants, and will be preparatory to the succeeding botanical excursion. Members are therefore requested to send or bring specimens of plants to them. A book prize, value 5s., will be presented to the Apprentice member who writes the best report on the excursions and demonstrations. Reports must be handed to the Secretary, Mr. George Sinclair, 144A, Princes Street, Edinburgh, not later than October 1, 1895.

COD-LIVER OIL EMULSION.—In the Edinburgh Sheriff Court on May 22, Sheriff Rutherford closed the record in an action by David Middleton, chemist and druggist, 85, Bruntsfield Place, against J. M. Wilson and Co., chemists, 16, Leven Street, for £50 for damages in his business and reputation by the alleged wrongful conduct of the defenders, and also for interdict. The pursuer states that he has made a "Cod-liver Oil Emulsion," the secret of which is known to him alone, and avers that the defenders have been making a practice of substituting some other preparation than that of the pursuer in dispensing prescriptions ordering his emulsion. The defenders

reply that they have never, until the present question arose, heard of the pursuer's preparation, and explain that nearly every chemist in the country has his own mode of preparing cod-liver oil for use. They admit that a boy called at the shop and presented a slip of paper containing a request for a bottle of Middleton's Cod-liver Oil Emulsion, but he was told they had no such preparation in their possession, though they could supply him with a bottle of cod-liver oil emulsion of their own preparation. The boy accepted the offer, and it was supplied.

EDINBURGH PHARMACY ATHLETIC CLUB.—The fourth annual sports were held at the Powderhall Grounds on Tuesday, May 28, at 6.45 p.m. These sports have now taken an important place in the Scottish athletic world, and there was a very large attendance of the public and a representative turn out of Scottish athletes. The weather was perfect. The following is the prize-list:—Putting the ball (confined), Mr. G. F. Anderson. 150 yards handicap (open), 1, A. R. Downer, time 15 seconds, thus breaking the Scottish record of 15½ seconds; 2, P. G. Sheach. 300 yards flat race, handicap (confined to apprentices), 1, W. B. Henry; 2, J. M. Foote. 120 yards flat race, handicap (open), 1, J. K. Ballantyne; 2, A. R. Downer; 3, P. G. Sheach; 4, J. M. Harper. Half mile handicap (confined), 1, J. T. Gibb; 2, J. Hogg. One mile bicycle race (confined), 1, H. L. Corder; 2, D. Foulis. 220 yards flat race, handicap (confined), 1, W. B. Henry; 2, J. P. Gibb. Quarter mile handicap (open), 1, M. C. C. Seton; 2, T. K. Fair. One mile flat race, handicap (open), 1, J. Stirton; 2, J. F. Henry. The prizes were presented by Miss Gibb, and Mr. David MacLaren presided, and congratulated the Club on their marked success. Among the judges were Messrs. D. B. Dott and George Coull, and prizes were given by W. A. Davies, Duncan, Flockhart and Co., J. F. Mackfarlan and Co., D. MacLaren; Maw, Son, and Thompson; Ralms, Clark, and Co.; and Thomas Welsh. Much credit is due to the Hon. Sec., J. P. Gibb, for the very complete arrangements.

Irish News.

ROYAL DUBLIN SOCIETY.—At the usual monthly scientific meeting of the Royal Dublin Society, on May 22, Mr. W. E. Adeney read a paper "On the Chemical Examination of Organic Matter in River Water," in which he referred to the fermentative changes in the constituent parts of river water, and said they consisted chiefly of the breaking down of the organic matter and the conversion of carbon into oxygen and of the nitrogen into ammonia. By observing these fermentative changes it would be seen that they at once showed the very great power they gave to the chemist to differentiate between the minute quantities of organic matter that occurred in river water such as could not be afforded by ordinary methods. Professor Reynolds then communicated a paper on "The Spectrum of Argon," and Mr. R. J. Moss afterwards read a paper on "The Preparation of Helium." He described experiments which he had recently conducted with the new gas, and stated that some thirty years ago a line was observed in the chromosphere and prominences of the sun, which, upon careful investigation, could not be assigned to any known element. All the other lines of the chromosphere and prominences were easily recognised as corresponding to those of known terrestrial elements. A hypothetical element called helium was held to account for the line. A few years ago Mr. Hildebrand announced that a mineral known as a cleveite contained a gas which he considered he had proved conclusively to be nitrogen. Professor Ramsay recently under-

took the further investigation of this gas, and found that it contained very little nitrogen, but consisted chiefly of argon and helium. The gas was obtained both by ignition *in vacuo* and by the action of acids, and the nitrogen it contains was removed by the long-continued action of an electric spark in the presence of an alkali. The gas was then removed by the aid of the spring mercury pump to a specially devised vacuum tube. At a pressure of about three to ten millimetres of mercury about one or two hundredths of the atmospheric pressure, the gas exhibited a brilliant spectrum when rendered incandescent by the current from an induction coil, and in this spectrum the third or helium line became conspicuous.

LAMP EXPLOSIONS.—Lamp oil has led of late, either directly or indirectly, to a large number of fatalities in Belfast. There have been a series of inquests in connection with deaths which have resulted from the explosion of lamps. The City Coroner has already drawn public attention to the matter. Another death occurred within the past few days. There has been a great deal said about the improper construction of the lamps, and the subject is one demanding the immediate attention of lamp manufacturers. Even where excellent gas and the brilliant electric light can be obtained there are people who will still adhere to the more primitive and, as they believe, much safer methods of obtaining illumination from either the candle or oil.

DYNAMITE EXPLOSION.—In Bangor, County Down, one of the most popular and also most populous seaside resorts in the north of Ireland, there was a serious dynamite explosion on Monday last. A new pier is being constructed, and it was in connection with the works being there carried on that the explosion occurred. Happily no person was injured, but Dr. Moore and one of his children, who were on his lawn at the time, had a very narrow escape, and the doctor's residence is damaged very extensively. A little later in the day and the roads adjacent to the place would have been crowded.

APOTHECARIES' HALL BANQUET.—Professor Tichborne, governor of the Apothecaries' Hall, gave a banquet to the medical profession on Thursday, May 23, at his residence, North Great Georges' Street, Dublin. Amongst others the following were present:—The Lord Mayor, the Provost of Trinity College, the Presidents of the Colleges of Physicians and Surgeons, the President of the Academy of Medicine, the President of the Pharmaceutical Society of Ireland, Sir Charles Cameron, Dr. Emerson Reynolds, etc. The vice-chair was occupied by Sir Robert Jackson, K.C.B., Deputy Governor. After the usual loyal toasts the toasts of the Royal College of Physicians and the Royal College of Surgeons were duly given, and responded to by the President, Sir William Stokes and Professor Emerson Reynolds returned thanks in appropriate speeches on behalf of the medical schools of Dublin. The health of the Governor was proposed by Dr. J. Little, President of the Academy of Medicine.

SNAKE-BITE has been successfully treated with chloride of lime in the case of a man, thirty years old (*Austral. Med. Journ.*). A whip snake bit him on the middle joint of the left fore-finger, and the effects were soon seen in dilation of the pupils, varying pulse, flushed and perspiring face. Solution of chloride of lime (1 in 60) was injected into the hand and elsewhere within two hours of the bite, and aromatic spirit of ammonia administered, followed by morphine later when the pain was acute. At the end of ten days the patient had recovered.

Miscellaneous News.

PRESCRIBING FOR STATUES.—If a chemist may prescribe for human diseases, remarks the *Pall Mall Gazette*, there is no reason why he should not treat those of a statue, and this is what an Apotheker-man at Cassel has attempted with wonderful results. Spohr, the musician, died at Cassel in 1859, and his monument is with us to this day. A fine bronze monument, but one which has lately needed washing. A young painter living at Cassel was commissioned to carry out the task, but feeling that soap and water were hardly up to the level of the occasion, he consulted a local chemist. "Try hydrochloric acid," was the chemist's advice, and Spohr was freely sprinkled and rubbed down with the corrosive the same day. The next morning the statue was as green as an image of Envy or Homeric fear; it had developed a fine rash of verdigris during the night, nor could the authorities at first conjecture what new form of sporadic (or Spohradic) disease had produced the strange transformation. The green statue of Cassel is said to be a great æsthetic success, and is attracting crowds of spectators every day.

TELEPHONE INDUCTION SIGNALS.—Mr. Preece, the electrical engineer of the General Post Office, lectured last week to the members of the London Chamber of Commerce in the Great Hall of the Carpenters' Company, and described how the cable connecting the Isle of Mull with the mainland at Oban was broken in March last. Before the cable ship came round to make repairs communication by induction was accomplished. The width of the channel at the points selected from the inductive circuit varies from one and a quarter to two miles. Skirting the coast of the island an overhead wire exists between Craigmuir and Aros, in a position well adapted to the object in view, the distance between this wire and the mainland being almost uniformly two miles. As there were no existing wires on the mainland parallel with the Craigmuir and Aros wire, a gutta-percha insulated wire was laid along the ground from Morven in a north-westerly direction, for about a mile and a half. It was earthed at Morven in a running stream, a mile away from the sea, and at the other end it was earthed in the sea itself. The wire joined up for the inductive circuit was at first twelve miles, but the resistance of the circuit was too great, and a division was made at a point exactly opposite the termination of the Morven gutta-percha wire. Until this was done satisfactory communications could not be established. The traffic actually dealt with by this arrangement between March 30 and April 8 was 110 ordinary messages and one Press message of 120 words. By this time the repairs of the cable were completed. The Mull operations were illustrated by a very fine wire on each side of the room, and the messages, inaudible to the natural ear, transmitted along one wire were read by telephones by the audience after the lecture.

AN AUTOMATIC DOCTOR.—The most remarkable automatic machine, according to the *Reporters' Magazine*, is "The Doctor Cure-all," in a town in Holland. It is a wooden figure of a man with compartments all over it, labelled with the names of the various ailments. If you have a pain, find its corresponding location on the figure, drop a coin in the slot and the proper pill or powder will come out.

KUMYZOON is a variety of kumys made from sterilised milk, without the addition of cane sugar, and may be kept almost indefinitely without change (*Mod. Med.*, April). It is said, therefore, to be practically free from alcohol and acetic acid. The lactic acid fermentation is induced by means of a special ferment.

Poisoning Cases and Inquests.

Strychnine.—James Sherrin, aged 55, died on Tuesday, May 14, at 127, Dover Road, Northfleet, from the effects of strychnine contained in a packet of "Battle's Vermin Killer" self-administered. Verdict: "Suicide during temporary insanity."

Laudanum.—James Carrol, aged 33, died on Saturday, May 18, at Mansfield Road, Torry, Aberdeen, from the effects of an overdose of laudanum.

Carbolic acid.—Maria Whitehead, aged 16, died on Thursday, May 16, in the Infirmary at Northampton, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst in an unsound state of mind."

Arsenic.—Emma Creed, aged 71, died on Tuesday, May 21, at Minworth, near Sutton Coldfield, from the effects of arsenic contained in a weed killer, taken in mistake for parsnip wine. Verdict: "Poisoning by misadventure."

Phosphorus.—Charles Smith Milne, aged 8, died on Tuesday, May 21, at Woodside, from the effects of sucking matches containing phosphorus.

Opium.—James William Bush, aged 53, died on Monday, May 20, at Yarmouth, from the effects of opium, self-administered. Verdict: "Death from misadventure, through taking an overdose of opium."

Carbolic Acid.—Henry Blunt, aged 22, of 30, Queen Anne Road, Maidstone, died on Wednesday, May 22, at Dover from the effects of carbolic acid, self-administered. Verdict: "Suicide."

Prussic Acid.—Harry Pike, aged 48, died on the way to the Westminster Hospital, London, from the effects of prussic acid, self-administered. At the inquest held on Friday, May 24, a verdict of "Suicide while temporarily insane," was returned.

Laudanum.—George Holford, aged 79, died on Wednesday, May 22, at New Barkby, from the effects of laudanum, self-administered. Verdict: "Suicide while in an unsound condition of mind." In reply to a juror, the coroner stated that a person could purchase nearly any quantity of laudanum, as it came under the second schedule in the Poisons Act. He thought that in any amendment of that Act laudanum should be included in a schedule which would make it much more difficult to obtain than at present. The jury agreed with the coroner that there was some need for an amendment of the law.

Carbolic Acid.—Ada Louisa Gidden, aged 28, died on Thursday, May 23, at 39, Hamilton Road, Wimbledon, from the effects of carbolic acid, self-administered. Verdict: "Suicide during temporary insanity."

Carbolic Acid.—James Charlton, aged 4, died on Sunday, May 26, at 190, Palmerston Street, South Shields, from the effects of swallowing carbolic acid. Verdict: "Accidentally poisoned by drinking carbolic acid."

Vitriol.—Mary Mepham, aged 35, died on Sunday, May 19, in the Stockton Workhouse, from the effects of vitriol, taken in mistake for glycerin for a cold. Verdict: "Death from misadventure."

Patent Office Business.

PATENTS PUBLISHED MAY 11.

Extracting Zinc from Ores, etc. (Hoepfner, C.).—Zinc is obtained from native or other zinc carbonate by heating it in the form of powder, and preferably at high pressure, with a strong solution of calcium chloride. The resulting zinc chloride which remains in the solution, is decomposed electrolytically to precipitate the bulk of the zinc as metal, but the last portion of the zinc is preferably precipitated as hydrate by means of slaked lime. No. 11,724 of 1894.

Mandelate of Antipyrine (Imray, O., communicated from the Farbwerke, formerly Meister Lucius and Brüning).—This compound, whose therapeutic use is not stated, is prepared by dissolving together in alcohol, benzene or other solvent, 188 parts of antipyrine and 152 parts of mandelic acid, and evaporating off the solvent. The colourless syrup which remains gradually solidifies to a hard crystalline mass, having a fusing point of 52° C. This salt is "soluble in nearly all solvents," and is separated into its constituents by acids and alkalis. No. 11,774 of 1894.

Chlorine (Brock, J., Driffield, V. C., Carey, A., and Ogg, G.).—Refers to three inventions, Nos. 11,966 to 11,968 of 1894, for the manufacture of chlorine by the "Deacon" process, in which hydrochloric acid gas and air are caused to re-act in admixture by exposure to a large surface of inert porous "catalytic" material. The first patent consists in causing the mixed gases to pass successively through two walls or surfaces of the porous material to ensure completion of the decomposition. The second comprises means for regularly withdrawing the porous material from the bottom of the mass, as it loses its power, while keeping up the supply at the top, and the third comprises means for keeping the heat of the mass uniform, or for rendering the lower portion the hotter when required. Nos. 11,966 to 11,968 of 1894.

Potassium and Sodium Cyanides (Castner, H. Y.).—The invention consists in allowing molten potassium or sodium to flow into a red hot retort preferably charged with wood charcoal, through which nitrogen, free from oxygen or oxygen compounds, is slowly ascending. The metal combines with the carbon and nitrogen, and the cyanide produced flows out through a tube at the bottom of the retort. No. 12,218 of 1894.

Potassium and Sodium Cyanides (Castner, H. Y.).—This invention corresponds with the above, ammonia gas being substituted for the nitrogen. The carbon may be replaced by fragments of iron, porcelain, or other inert material, gaseous hydrocarbons being passed into the retort together with the ammonia. No. 12,219 of 1895.

Acetylene (Lake, H. H., communicated from Dickerson, E. N., and Suckert, J. J.).—The gas is produced from the carbide of calcium, potassium, or other metal by the action of water. The process is made continuous, the gas being dried by passing over a surface of the carbide which is not being treated with water, and condensed by the pressure produced by its generation. The inventors state that when the condenser is cooled to 56° F. liquefaction occurs at 485 lbs. pressure, while at 68° F. a pressure of 610 lbs. is required. No. 5730 of 1895.

The March exports of rubber from Pará amounted to 1,959,659 kilos, of which 557,547 kilos came from Manóas. Of the total, 1,412,765 kilos were exported to the United States and 546,894 kilos to Europe.

Trade Marks Applied For.

[From the *Trade Marks Journal*.]

No. 185,461.—CHEMICAL SUBSTANCES used in manufactures or philosophical research and anti-corrosives, but not including varnishes and paints, mineral dyes, pigments, and artists' colours, and not including any goods of a like kind to any of these excluded goods.—William Ewing and Co., 7, Royal Bank Place, Glasgow. February 9, 1895. Device: A monkey and the words "Monkey Brand."

No. 186,388.—DISINFECTANT PREPARATIONS in fluid, powders, sawdust, soaps, and other disinfecting preparations manufactured by the proprietors.—Odams' Manure and Chemical Company, Limited, 116, Fenchurch Street, London, E.C. March 21, 1895. Device: Portrait of a woman.

No. 186,634.—A PREPARATION OF NATURAL BITUMEN to keep injurious insects and growths from the roots of plants.—Augustus Figge, Weser House, Hameln, Germany. March 30, 1895. Word: "Strabonite."

No. 187,173.—A VETERINARY PREPARATION.—Archer and Co., 7, Lovaine Terrace, Newcastle-on-Tyne. April 23, 1895. Device: Fac-simile signature of applicants and the words "Archer's wound lotion." The essential particular is the signature of the applicants.

No. 186,600.—PREPARATIONS FOR THE HAIR, SKIN, and teeth, and perfumed soap, all included in class 48. John Stuart Collins, 82, High Street, Galashiels, Scotland. March 29, 1895. Word: "Keora."

Obituary.

HAYWARD.—On May 14, William Griffin Hayward, Pharmaceutical Chemist, Reading. (Aged 74.) Mr. Hayward went to Reading in 1848, carrying on his business in Bridge Street, which he retained until his retirement in 1890. He was the first clerk to the "New Reading Gas Company," and afterwards one of the two collectors. Mr. Hayward recently joined the Board of Directors of the Reading Gas Company. He was for twenty-two years a Guardian of the Poor, and for one year the Chairman of that body. He was actively connected with the Dispensary, the Savings' Bank, the Charity Organisation Society, and other undertakings for the good of the people. The Volunteer movement also had his active support, he being enrolled in the Reading Rifle Corps in July, 1859, retiring in 1880. He was a staunch supporter of the Liberal cause, and was for some time Secretary of the Reading Liberal Association.

CLARKE.—On May 22, Thomas Clarke, Chemist and Druggist, Stockport. (Aged 55.) Mr. Clarke had been a member of the Pharmaceutical Society since 1872.

SPENCER.—On May 26, William Henry Spencer, Pharmaceutical Chemist, Burnham Market, Norfolk. (Aged 81.) Mr. Spencer had been a member of the Pharmaceutical Society since 1853, and had been in business for half a century.

CHIMAPHILIN, a crystalline neutral principle from *Chimaphila umbellata*, Nuttall, and *C. maculata*, Pursh, is shown by Ridenour (*Am. Journ. Pharm.*), to form a chlorine derivative in light yellow needle-shaped crystals, and a bromine derivative in tabular crystals, which decompose in air, whilst nitric acid acts on it to form a nitro-derivative of an oxidation product of chimaphilin, in lemon-yellow tabular crystals.

New Remedies.

[The notes given under this heading for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

APPLICATION FOR MULTIPLE WARTS.—Kaposi recommends flowers of sulphur, 10 parts; glycerin, 25 parts; glacial acetic acid, 5 parts. Mix. A daily application is made to the wart-covered spot, when the excrescences shrivel up gradually and finally drop off. The bottle should be well shaken before each application (*L'Union Pharm.*, xxxvi., 209, after *Moniteur Thérap.*).

BROMIDE OF STRONTIUM IN EPILEPSY.—At the meeting of the Medical and Scientific Society of the Catholic University, Dublin, Dr. Roche recorded his favourable experience of bromide of strontium, which he finds more beneficial than the other bromides, although in some cases it is preferable to give both potassium and strontium bromide together, an average dose for an adult is 10 grains three times a day, either alone or with an equal quantity of the potassium salt (*Brit. Med. Journ.*, 1895, 1089).

ETHYL-CARBONATE OF PARACETAMIDOPHENOL.—This substance, which forms a colourless crystalline powder, soluble in alcohol, slightly soluble in water, is found by Treupel to possess antipyretic, analgesic, and hypnotic properties. It lowers febrile temperature two or three degrees, and is efficacious in cephalalgia and neuralgia, the analgesic action being evident in half an hour. The dose is 50 centigrammes (*Répert. de Pharm.* [3], vii., 220).

POWDERED GALLS IN THE TREATMENT OF BURNS.—Dr. Grose finds the application of an ointment composed of 1 part of powdered galls with 8 parts of boric acid ointment, an excellent means of diminishing the discharge and disinfecting the wound, so as to promote rapid cicatrization (*Rev. de Thérap.*, April, 1895).

BROMIDE OF GOLD IN ECZEMA, ETC.—Dr. Ohmann Dumesnil finds gold bromide an excellent adjuvant of mercury or arsenic in the treatment of chronic eczema or obstinate syphilitic skin affections. He has found cases which remained intractable to arsenical or mercurial treatment alone, which have been speedily cured by the association of gold bromide with these metals.

INTRAPARENCHYMATOUS INJECTION OF β -NAPHTHOL IN TUBERCULOSIS.—Dr. Fernet injects 30 centigrammes of the following mixture, which in such a dose contains 6 milligrammes of β -naphthol:—Precipitated β -naphthol, 40 centigrammes; gum tragacanth, 20 centigrammes; distilled water, 20 grammes (*La Semaine Méd.*, April 3, 1895).

CALCIUM BORATE.—This salt, which exists as a white powder, soluble in solutions of calcium chloride or of borax, may be used, according to Dr. Alberto, with advantage in the form of ointment in the treatment of burns, moist eczema, and fetid perspiration. Internally it is said to be an excellent antidiarrhoeic for children. It may be exhibited as follows:—For external use, borate of calcium, 5 parts; glycerin, 5 parts; lanoline, 20 parts; balsam of Peru, 1 part. Mix. Internally, borate of calcium, 60 centigrammes; powdered saleg, 20 centigrammes; sugar, 30 centigrammes. A child of five years of age may take three such powders daily. Speaking generally, the dose of borate of calcium in such powder should be as many decigrammes as the child is years old.

PEROXIDE OF HYDROGEN IN DIPHTHERIA.—Dr. Navratil administers a mixture of hydrogen peroxide internally in diphtheria. This treatment has the advantage of preserving the unaffected parts in a normal condition while the non-irritant disinfectant has no bad effect on the patient's system, even in the case of young children after prolonged use, and the diseased parts are allowed to remain in a perfectly quiescent state. The formula employed is peroxide of hydrogen, 60 parts; glycerin, 15 parts; distilled water, 250 parts. To be kept in a dark bottle, a teaspoonful to be taken every quarter of an hour without interruption day and night. Over three hundred cases have been treated by this method with good results. The earlier it is commenced the better chance there is of success (*Wien Med. Wochenschr.*, after *Thérap. Monatsch.*, April, 1895).

TREATMENT OF SMOKERS' GINGIVITIS.—Vian employs salol, 1 part; spirit of peppermint, 100 parts; tinct. catechu, 4 parts. A teaspoonful in half a tumblerful of warm water to be used as a mouth-wash (*Thérap. Monatsch.*, April, 1895).

FORMS OF EXHIBITING CHLORAL HYDRATE EXTERNALLY.—For cutaneous pruritus—chloral hydrate and carbolic acid, of each, 1 part; olive oil to 100 parts; the liniment to be rubbed on the itching part. For toothache—chloral hydrate, camphor, carbolic acid, and glycerin, of each equal parts. A piece of wadding saturated with this mixture to be placed in the cavity of the tooth. For earache—similar to last, substituting castor oil for the glycerin. Warm the mixture and drop a few drops into the ear. For acute coryza—chloral hydrate, 1 part; castor oil, 3 parts. To be painted inside the nose, which must first be freed from secretion (*Brodnax, in Sem. Médicale*).

SALIGENIN IN RHEUMATISM AND GOUT.—Lederer having succeeded in producing saligenin synthetically from phenol and formaldehyde, this body has become available for therapeutic use. It has been tried with success in eight cases, seven of acute rheumatism and one of gout, with good effects. No bad effects were produced by giving doses of 1/2 to 1 gramme every one or two hours, either in powder or in dilute alcoholic solution thus:—Saligenin, 4 parts; spirit, 30 parts; distilled water to 200 parts. One to two tablespoonfuls every hour (*Munch. Med. Woch.*, after *Thérap. Monats.*, April, 1895).

BROMALINE AS A SUBSTITUTE FOR METALLIC BROMIDES.—Laquer gives results obtained in the treatment of epilepsy and other nervous affections treated by bromethylformine (bromaline), and arrives at the conclusion that it possesses marked advantages over the alkaline bromides, since it does not provoke furunculosis or give rise to fetid breath, or other undesirable symptoms. Bromaline is very soluble in water, and free from the disagreeable odour of bromide of potassium. For children it may be prescribed as follows:—Bromaline, 10 parts; distilled water, 10 parts; syrup of orange, 90 parts; a dessert-spoonful for a dose once or twice daily. Adults may take from 2 to 8 grammes of bromaline per diem (*Rev. Inter. de Méd. et de Chir.*, 1895, p. 153).

ADMINISTRATION OF TRIONAL.—This remedy is prescribed by Dr. Galliard in doses of 1 gramme daily in unleavened bread to avoid the nauseous taste of the drug. A few cases are refractory to its influence, but generally sleep is produced in twenty-five minutes, and lasts almost all night. Since it appears to be purely hypnotic in its action, the author considers it specially indicated in neurasthenic cases (*Univ. Med. Journ.*, new ser., vol. iii., p. 101).

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

COLOUR REACTION FOR COD-LIVER OIL.

[872.] According to Röseler, when 5 parts of genuine cod-liver oil are shaken in a test tube with 3 parts of freshly prepared aqua regia, at the end of eight minutes there is formed at the juncture of the liquids a series of greenish rings passing to brownish violet. Inferior oils give either a very slight reaction or none at all (*Prager Rundschau*).

NUTRIENT MEDIUM FOR MICROBES IN WATER.

[873.] Dr. Labarelle recommends the following:—Gelatin, 20 parts; dry peptone, 10 parts; sodium chloride, 10 parts; potassium nitrate, 1 part; distilled (sterilised) water sufficient to make 100 fluid parts. This may be preserved in sterilised tubes: for use add 10 C.c. of this solution to 100 C.c. of the water; this will give a nutrient medium containing gelatin, 2 grammes, peptone; 1 gramme (*Mod. Medic.*, Jan., 1895).

MASKING THE BITTER TASTE OF QUININE.

[874.] Dr. Lemanski, of Tunis, states that of all the various methods of disguising the bitter taste of quinine salts, he has found none to excel that of adding the prescribed dose to a cup of coffee, slightly fortified with a little cognac or any other alcoholic beverage. This means has been effective in overcoming the repugnance of labourers working in malarial regions to the medicinal doses of quinine which the authorities issued to them, and therefore insured a greater chance of the dose being properly taken. Other observers have reported very favourably of the excellence and convenience of the method. The hydrochlorate of quinine is to be preferred to the more frequently used sulphate, since it appears less frequently to give rise to digestive disturbances (*Rev. Internat. de Méd. et de Chir. Prat.*, April 10).

PASTILLES OF PHOSPHORUS.

[875.] Professor Gartner prepares pastilles of phosphorus thus: An accurately weighed quantity of phosphorus is dissolved in an accurately weighed amount of cacao butter and the solution filtered. The fatty solution of phosphorus is then worked into a paste by adding to it cocoa powder free from fat; it is then rolled and divided into pastilles so as to contain a definite weight of phosphorus. These pastilles are then varnished with resin, and after drying, dipped into liquid chocolate. Care must be taken to keep them from the reach of children (*Pharm. Centralhalle*, April 25, 1895).

FORMULÆ FOR DISPENSING ALUMNOL.

[876.] (1), in the pure state as a dusting powder for venereal sores; (2), mixed with 80 to 90 per cent. of French chalk for burns; (3), in 1½ per cent. solutions for washing excoriations, acne or eczematous surfaces; (4), in from 2 to 10 per cent. alcoholic solution for urticaria, sycosis, etc.; (5), as an ointment, alumnol, 10 parts; hard paraffin, 5 parts; liquid vaseline oil, 35 parts; anhydrous wool-fat, 60 parts; (6), as a colloidion, colloidion, 160 parts; castor oil, 20 parts; alumnol, 18 parts (*Les Nouveaux Remèdes*, Jan., 1895).

IMPROVED FORMULA FOR CHLOROFORM OINTMENT.

[877.] Chloroform, 10 parts; hard paraffin, 5 parts; vaseline, 85 parts. Melt the paraffin with a gentle heat, when almost cold add the chloroform gradually and triturate rapidly in a mortar. The product should be preserved in a hermetically sealed vessel (*Crouzel L'Union Pharmaceutique*, March 3, 1895).

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

* * * Queries should be addressed "Editor," and will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTERS.

THE NEW COUNCIL.—Mr. James S. Prior, of Melton Mowbray, thinks a new era is commencing in pharmaceutical politics, and that it behoves every chemist to better himself and endeavour to improve the present state of affairs in the craft. He wants a Council which has the courage of its convictions, with a little British pluck and perseverance. Past Councils, composed of excellent men with good business abilities, have attempted and done little, according to this critic who hopes "the new Council will rouse itself and not be *Vos et præterea* and will introduce into Parliament, and peg away until it is passed, a Bill to deal with: 1st. The Preliminary Examination, so that we may have a sensible Preliminary instead of the present 'fare'. 2nd. Enforcing a compulsory attendance to a stated number of lectures, etc., before presentation for the Minor examination. These alterations may seem somewhat harsh, but such changes would prove a real kindness to candidates, saving them time, anxiety, and money. 3rd. To make it illegal for any limited company to carry on the business of chemist and druggist unless every shareholder be a qualified man." He also wants "a Council which has more discretion, sense of honour, and fairness than appoint one of its own professors (no matter how good a man he may be) on the Board of Examiners." Finally, with a comprehensive grasp of the only true conditions under which reforms can be effected, he remarks that "It is for each individual pharmacist to do his utmost to bring these changes about and give the new Council to understand that unless they do more for the trade than their predecessors, they must make room for better men, who would do their level best to improve the condition of our occupation, education, and examinations."

ANSWERS.

A. MIDDLETON.—The copy returned was perfect, but wrongly folded. Another has been sent.

S. C. REDMAN.—THRESH'S REAGENT for alkaloids is made by mixing liquor bismuthi, B.P., 1 oz.; potassium iodide, 90 grs.; strong hydrochloric acid, 90 grs. It forms an orange-coloured solution, which gives red precipitates with dilute solutions of alkaloids in the cold. FRÖHDE'S REAGENT is prepared by dissolving molybdic acid or ammonium molybdate, 5 Mgm., in strong sulphuric acid, 1 C.c. It is one of the most useful oxidation tests for alkaloids.

LEWIS VIGOR.—We take it that the ordinary kiln-dried variety is meant.

PENDLEBURY.—Messrs. Beiersdorf and Co., of Altona, Germany, are the patentees and manufacturers of the preparation. You ought to be able to procure it through any first-class firm of wholesale druggists.

COMMUNICATIONS, LETTERS, ETC., have also been received from Messrs. Barnes, Grierson, Hill, Holding, Kemp, Newbery, Nightingale, Sinclair, Stark, White.

THE CHEMICAL HISTORY OF ACONITINE.*

A REPLY TO DR. MARTIN FREUND.

BY PROFESSOR W. R. DUNSTAN AND F. H. CARR.

We are unwilling to enter again into a discussion of priority with Messrs. Freund and Beck as to the establishment of the new view of the constitution of aconitine, but the fresh reply to our claim which Herr Freund (*Ber.*, 1895, xxviii, 192),† after the lapse of a year, has been led to make, renders it necessary for us to call attention to the facts of the case.

In the Proceedings of this Society recording the meeting of January 18, 1894, three short papers of ours were printed to which Herr Freund has made very misleading references. The first proves that the alkaloid once obtained by Wright from aconite root, and called "Picroaconitine," is not a pure substance, but consists chiefly of "Isaconitine," which we had previously shown to be *benzoylaconine*‡ (*Trans.*, 1893, lxiii, 448). The second paper shows that when aconitine is heated at its melting point it loses one molecular portion of acetic acid, forming a new alkaloid, *pyraconitine*. The third paper proves that acetic acid is formed, both when aconitine is converted into "isaconitine" by heating its salts with water, and also when aconitine is completely hydrolysed with formation of aconine, and, therefore, that it is probable the acetyl group of aconitine may be separated under both these conditions. Now the percentages of carbon and hydrogen in "isaconitine" represented by the old formula $C_{23}H_{45}NO_{13}$, or by the new formula $C_{21}H_{43}NO_{11}$, and also in aconine, using the two corresponding formulae $C_{20}H_{41}NO_{11}$ and $C_{18}H_{39}NO_{10}$ are so nearly the same that proof as to the separation of one acetyl group from aconitine could not be obtained from the results of the ultimate analysis of these products; the elimination of the acetyl group making but little difference in the percentage composition.

Benzaconine.

$C_{23}H_{45}NO_{13}$ (old formula) C = 61.20; H = 6.95.

$C_{21}H_{43}NO_{11}$ (new formula) C = 61.48; H = 7.10.

Aconine.

$C_{20}H_{41}NO_{11}$ (old formula) C = 57.46; H = 7.55.

$C_{18}H_{39}NO_{10}$ (new formula) C = 57.48; H = 7.78.

The required proof, however, could be gained by estimating accurately the proportion of acetic acid separated in these changes. Now, on attempting to estimate exactly the quantity of acetic acid formed under these conditions, we met with unexpected difficulties, so that, at the time these short papers were written, quantitative estimations of the desired degree of accuracy had not been made. On this account, we were unable to do more than indicate the nature of the conclusions at which we had arrived, and, for the same reason, we were obliged to retain the old formula for "isaconitine" in the first paper.§ To have done otherwise would have been to anticipate the proof which could only be gained by exact quantitative determinations of acetic acid not, at that time, made; but we pointed

out at the close of the third paper that if this view "should prove to be correct the nomenclature and formulae of aconitine derivatives will need entire revision."

Wishing to complete this proof by making the necessary determinations of acetic acid, we only presented to the Society two full papers for the *Transactions*, holding over the third until these determinations had been made. In about a fortnight these estimations were finished, and they proved that exactly one molecular proportion of acetic acid separates when aconitine changes into "isaconitine" or into aconine. Therefore, aconitine must be, as we had indicated in our third short paper, mentioned above as published in the *Proceedings*, an acetyl derivative which loses its acetyl group under these conditions.

The *Berichte* issued from Berlin on February 19, 1894 (p. 433), contained a short paper by Messrs. Freund and Beck, their first contribution to the literature of aconitine, in which they stated that aconitine yields acetic acid on hydrolysis, but gave no estimations of the amount of acetic acid formed, or, indeed, any experimental proof of their assertion that aconitine is acetylbenzoylaconine. That they had seen our papers in the *Proceedings* is evident, from the fact that they actually quote from the first on "picroaconitine," although they entirely ignore the two following papers, which not only indicate the conclusion they bring forward, but also supply experimental evidence of its truth. This proceeding seemed to us so unfair that we at once sent to the President of the Society a short statement of our quantitative determinations, at the same time drawing his attention to the paper of Messrs. Freund and Beck. The President directed that this statement should be included in the March number of the *Journal* (1894), then passing through the press, in which the first two papers had already been printed.* This third paper contains the only complete proof which has hitherto been adduced, that aconitine is *acetylbenzoylaconine*, and it will be seen that it furnishes the results of estimations of acetic acid which, it was stated in our short paper published in the *Proceedings* nearly two months before, were in the process of being made.†

At the same time we sent to the German Chemical Society a statement of our claim for priority, which was printed in the *Berichte* of March 19, 1894 (p. 664). In his first reply to this statement,‡ Herr Freund (*Ber.*, 1894, xxvii, 720) attempts to justify the absence of any allusion by him to our short papers in the *Proceedings*, on the ground that the production of acetic acid had already been observed by Messrs. Ehrenberg and Purfurst in 1892, and that the work of these observers formed the basis of his inquiry.

Now Ehrenberg and Purfurst had boiled aconit-

* Having looked into the facts of the case this course had my entire approval.—EDITOR, *Journ. Chem. Soc.*

† The circumstances under which the third paper was published prevented us from including in it the full discussion of our results which we had previously intended it to contain, and it is obvious that through inadvertency the formulae for aconine and its derivatives are incorrectly printed in the table at the close of this paper, but they are correctly given in the text immediately above.

‡ Herr Freund states that he has not replied until now (*Ber.*, xxv, Feb., 1896, p. 192), but a reference to his paper in the *Berichte* of March 19, 1894, will show that the excuse he makes is wanting in accuracy.

* Reprinted from the *Journal of the Chemical Society*.

† *Ph. J.*, ante, p. 773.

‡ Until the simultaneous production of molecular equivalents of "isaconitine" and acetic acid had been established, it is clear that the experimental evidence strongly supported the hypothesis of isomerism.

§ Herr Freund has put an entirely erroneous interpretation on this circumstance.

tine with water, and stated that they had identified in the product benzoic acid; methyl alcohol; an acid, *probably* acetic acid; *probably* formic acid, together with the alkaloids named (but neither described nor analysed) "picroaconitine" and "napelline." They conclude, without quantitative proof, that *aconitine first loses benzoic acid, forming picroaconitine*, then that picroaconitine loses methyl alcohol, forming napelline, and, lastly, that napelline loses acetic acid, forming aconina. Messrs. Freund and Beck profess that it is these manifestly erroneous observations and conclusions which have led them to the very different result that aconitine is acetylbenzoylaconine, and that it loses acetic acid but not benzoic acid, forming "picroaconitine." As a matter of fact, they reject every observation and conclusion arrived at by Ehrenberg and Purfürst, except the suggestion that acetic acid is *probably* a product of the decomposition of aconitine; that it is so was proved for the first time by us, and its true bearing indicated in our two short papers; to these Messrs. Freund and Beck do not even refer, although they were published more than a month before.

With this plain statement of the facts of the case we can confidently uphold our claim to priority against Herr Freund's criticism.

Messrs. Freund and Beck have proposed to alter to $C_{33}H_{47}NO_{11}$ the formula of aconitine which we give as $C_{33}H_{46}NO_{12}$, and Herr Freund professes to be aggrieved that we have not so far considered his proposal.* As a matter of fact, any discussion at the present time as to the exact formula of aconitine must be futile, as, until simpler derivatives of aconitine have been prepared and analysed, the question must remain, to a large extent, an open one. At the same time, we may state that analyses of the aconitine derivatives recently prepared by us do not furnish any ground for adopting the formula which Herr Freund has prematurely advanced; on the contrary, they lead us to prefer that long ago proposed by ourselves (see Proc., February 18, 1895). This will be made clear by an inspection of the following table:—

	Freund. Calculated.	Dunstan and Carr.	
		Found.	Calculated.
Triacetyl- aconitine } $C_{45}H_{85}NO_{14}$	C..... 62.25	60.42	$C_{35}H_{71}NO_{15}$ 60.54
	H ... 6.87	6.82	6.59
Diacetyl- aconitine } $C_{39}H_{71}NO_{12}$	C..... 62.55	60.98	$C_{27}H_{49}NO_{14}$ 60.74
	H ... 6.99	7.06	6.70
Pyraconi- tine hydro- bromide ... } $C_{32}H_{49}NO_9HBr$	C..... 57.65	55.80	$C_{31}H_{41}NO_{10}HBr$ 55.69
	H ... 6.60	6.28	6.28
Aconine ... } $C_{28}H_{41}NO_8$	C..... 60.12	57.31	$C_{24}N_{28}NO_{10}$ 57.48
	H ... 8.21	8.02	7.78

* It will be evident that our new formula for benzacconine, $C_{31}H_{48}NO_{11}$, which Herr Freund asserts is based solely on the analysis of the aurichlor-derivative (the existence of which, by the way, he denies), rests chiefly

Messrs. Freund and Beck have also attempted to show that the isomeric forms of aconitine aurichlorides, as well as aurichlorbenzaconine, described by one of us and Mr. H. A. D. Jowett (Trans., 1894), do not exist, but it has been shown (Proc., February 18, 1895), by a re-examination of these compounds, that our original observations are correct.

THE STUDY OF MATERIA MEDICA.

The following suggestions concerning the work that may be done in materia medica or pharmacognosy proper during apprenticeship, and how to do it, are given in the hope that they may prove useful to intending students.

Pharmacognosy, or the recognition of vegetable and animal drugs, may be divided into two sections.

The first includes the recognition of drugs by such characters as may be seen under a lens, or may be ascertained by the senses of sight, touch, smell, and taste. The second deals with crude drugs in powder, and includes the examination of drugs under the microscope and the recognition of the tissues that are characteristic of each. This more properly comes under vegetable histology.

Starting with the assumption that an apprentice ought to become fully acquainted with the materials used in his business, we find that there are about 166 crude vegetable and animal products official in the British Pharmacopoeia; adding to these sixty-four not in the B.P., but of which knowledge is required, and about fifty others regularly occurring in wholesale drug lists, and therefore evidently more or less in demand in trade, we have a total of 280.

It may be presumed that a study of botany, so far as the parts of a plant are concerned, has preceded the study of materia medica. In other words, the second year of apprenticeship may conveniently be given to materia medica, the study of which should be commenced with a few axioms deeply impressed on the mind:—

1. That there are no two drugs exactly similar in every respect. Each distinct species of plant differs in macroscopical as well as in microscopical and physical characters.
2. That some characteristics are, to a certain extent, common to certain groups of plants, such as milky juice in the Apocynaceae, etc., and oil receptacles in the leaves of the Myrtaceae and Rutaceae.
3. That diagnostic characters are best seen by comparison, hence the various products are advantageously studied in groups, as indicated in the official list of materia medica in the syllabus of the examinations.
4. Samples of drugs obtained at different times or from different geographical and commercial sources vary considerably in appearance and value.
5. No feature should be considered to be a diagnostic one unless it occurs in all samples of the drug.
6. On meeting with a difficulty the student should not rest until it is solved.

It is a common mistake amongst students to endeavour to recognise drugs by their general

on the demonstration that exactly one molecular proportion of acetic acid accompanies its production from aconitine.

appearance. Nothing could be more fallacious, as many an examinee has found to his cost. "General appearance" signifies features that may be noticed by a superficial glance, such as size and colour, both of which are apt to vary. Thus, dandelion root and pellitory root, serpentary and Indian pink root, cummin and some varieties of fennel fruit, hemlock fruit and Russian anise, kino and extract of logwood, might easily be mistaken for one another at a cursory glance. Again, cascarilla bark may be met with in slender pieces not two inches long, or in "bold" quills several inches long; cusparia bark may be hard or spongy externally, in pieces two inches long or in large quills nearly an inch and a half broad and eight to ten inches long.

The apprentice will do well to examine all the roots, barks, leaves, etc., in the pharmacy systematically and in groups, taking, for instance, all the roots *seriatim*, and so on. A note-book, with clearly but concisely written notes, allowing plenty of space between words and lines, so as to ensure easy reference, will, in the case of some persons, serve to impress what is learnt on the memory, and in the case of others will prove useful for subsequent reference. Leaves and flowers are best studied between April and September, when fresh material can be obtained. If dried material only is obtainable, softening in water over a spirit lamp, or soaking in hot water, will enable the student to observe the outline and characteristic features of the specimens.

A few illustrations of the examination of drugs will next be given.

(To be continued.)

THE BRITISH PHARMACOPOEIA.

At the meeting of the General Medical Council, on May 28, Sir Richard Quain referred in his presidential address to the revision of the British Pharmacopoeia which is about to be undertaken, and gave some historical details as to the origin of the national medicine book in the following words, for a corrected report of which we are indebted to the courtesy of Mr. Miller, the Registrar.

"The subject of a revised edition of the British Pharmacopoeia having been recently so much discussed, it seemed to me that I would not be occupying the attention of the Council unprofitably if I devoted a small portion of this address to a *résumé* of what has been done hitherto in relation to the Pharmacopoeia. No doubt it would be a matter of interest to go back to the origin of such works as the Pharmacopoeia generally, but I will not presume to occupy more of your time than to say that the first notion of such a work originated, according to the statement of my learned friend Dr. Munk, in the 'Dispensatory' of Dr. Valerius Cordus, issued in 1542 on the authority of the University of Nuremberg.* It was described as a collection of medical recipes gathered from the works of the most esteemed writers, which he had met with in his travels. The 'Pharmacopoeia Augustana,' issued in 1601, is the reputed parent of the various pharmacopoeias that have succeeded it.

"The first London pharmacopoeia was issued in 1618, just a century after the foundation of the Royal College

of Physicians. A second pharmacopoeia was published in 1650, a third in 1677, and a fourth in 1721, during the presidency of Sir Hans Sloane. The authors of this work took credit to themselves 'for rejecting medicines of little use, for altering formulae that were absurd and inconsistent, for excluding such as savoured of superstition and, generally, for the endeavour to make the work consonant to reason and experience.

..... The compilers of the Pharmacopoeia hoped to compress within moderate bulk such a variety of medicines as would satisfy as well the lover of the old as the lover of the modern prescriptions, those who preferred simplicity equally as those who still adhered to complexity in official formulae. Such sentiments and such feelings are very much those which would seem to guide the compilers of the later editions of the Pharmacopoeia.

"The next edition was long in preparation, and with a few exceptions it may be regarded as a new work. It was published in 1746, and may in every respect be looked upon as a great improvement on the edition of 1721, and the third edition that had preceded it.

"Successive editions, at intervals which averaged about twenty-five years, the shortest being twelve and the longest forty-four years, were prepared with more or less improvement as regards their construction.* Of these the ninth, published in 1836, was the most important. It was produced under the management of the elder Dr. Babington, of Sir George Tuthill, of Dr. Paris, and of Dr. Hue, aided by Mr. Richard Phillips, F.R.S., who had devoted much attention to pharmaceutical chemistry. This pharmacopoeia was undoubtedly a great improvement upon the previous edition, and is marked by the admission for the first time of the alkaloids, such as aconitina, morphia, quina, strychnia, and veratria, of hydrocyanic and phosphoric acids, of iodine, bromine, and preparations of creosote, ergot, and lobelia. 'If,' says the College, 'some of these would appear as yet but little approved by experience, we have, nevertheless, included them, that whosoever should think fit to administer them may have them at hand, accurately prepared and fitted for his use.'

"The tenth and last edition, published in 1851 differed little from the previous edition, chloroform, cod-liver oil, tannic and gallic acids, and atropine were included, and aconite was omitted, so, too, was the bromide of potassium.

"Pharmacopoeias very similar to that of London were also published in Edinburgh and Dublin by the respective Royal Colleges of Physicians, but I am sorry to say that I had not time nor material for referring to them specially.

"By the Medical Act (1858), the right of future publication of the pharmacopoeias of England, Scotland, and Ireland was, with the consent, asked for and obtained, of the several Royal Colleges, transferred to our Council by Clause LIV. of the above-mentioned Act, which reads as follows:—

'The General Council shall cause to be published under their Direction a Book containing a List of Medicines and Compounds, and the Manner of

* 'Annals of the Royal College of Physicians,' vol. iii., p. 371.

* The average interval of the publication of the British Pharmacopoeia would seem to be about ten years.

preparing them, together with the true Weights and Measures by which they are to be prepared and mixed, and containing such other Matter and Things relating thereto as the General Council shall think fit, to be called "The British Pharmacopoeia"; and the General Council shall cause to be altered, amended, and republished such Pharmacopoeia as often as they shall deem it necessary.'

"On the first day of the Council's first session, November 23, 1858, a Committee was appointed to report at the next meeting as to 'the recommendation of a Committee for preparing the National Pharmacopoeia, and the powers to be conferred on that Committee.'

"In accordance with their report a Pharmacopoeia Committee was appointed, with powers to request the co-operation of the three Royal Colleges of Physicians, and the Pharmaceutical Society (Minutes, vol. i., p. 6).

"This Committee appointed sub-Committees for England, Scotland, and Ireland, the members of which, as experts in certain departments, were to undertake the preparation of the work. The sub-Committee in London consisted of the following members of the Council:—Sir James Clark and Mr. Nussey, and as experts Dr. Farr, Dr. Garrod, Mr. Peter Squire, and Mr. Warrington; in Edinburgh of Dr. Christison, Dr. MacLagan and Dr. Wilson; in Dublin of Sir Dominic Corrigan, Dr. Aquilla Smith, Dr. Apjohn, Mr. Leet and Dr. Nelligan.

"It appears that this issue of the Pharmacopoeia, after much pains and trouble had been expended on its preparation, was ready for publication in November, 1863; that is, five years after its inception. It was resolved that it should be issued in two sizes demy 8vo and 12mo (Minutes, vol. ii., pp. 315–318, December 12 and 19, 1862), and of the former size 13,000 copies were printed, and of the latter 15,000.

"The cost of the preparation of this edition seems to have been £6229, of which £4430 were paid for 'authorship and editing.'

"The work when complete was, according to Act of Parliament, submitted to the Treasury, to decide on the price, and by the Treasury it was referred to the Controller of H.M. Stationery Office, who reported that the publication might have been got up in a far less expensive style for less than half the cost of printing and binding. The Executive Committee thanked the Secretary of the Treasury for his communication, and gave an assurance that in future editions his recommendations should receive attention (Minutes, vol. iii., p. 333).

"This work had scarcely issued from the press when faults in it and objections against it were found on all sides. Sir Thomas Watson, whose great experience, prudence, and moderation in language could not be questioned, declared from the chair of the College of Physicians that the work was 'a dangerous one,' and must not be used. The result was that this edition was virtually suppressed, to the great pecuniary loss of the Council. This result cannot be read as favouring the appointment of special experts in the construction of the Pharmacopoeia, inasmuch as the Committee

which prepared this issue were largely composed of eminent experts. It seemed to me, who had then recently been nominated by the Crown as a member of the Council, that the Council must prepare a revised issue of the work. On a motion made by me on April 27, 1864, and adopted by the Council, a Committee was appointed to consider and report on the arrangements to be made for producing a new edition of the British Pharmacopoeia (Minutes, vol. iii., p. 21).

"The Committee, as ultimately appointed, consisted of only five members, the President (Dr. Burrows), Dr. Christison, as Chairman, Dr. Sharpey, Dr. Apjohn, and myself as Honorary Secretary, and by these gentlemen the second edition was prepared for the press. Dr. Christison, Dr. Farr, and Dr. Apjohn, who had rendered assistance in the preparation of the first edition, were requested to continue their services as reporters.

"On April 15, 1865, the Committee reported that they had engaged the services of Mr. Warrington, F.R.S., of the Society of Apothecaries, and Dr. Redwood, of the Pharmaceutical Society, to aid in the preparation of this edition.

"When this work was completed by the Committee above named and their pharmaceutical assistants, the Council was so well satisfied with the result that they voted an honorarium of £500 to the Committee. It should be mentioned that Mr. Warrington's health failed, and that Dr. Redwood had then sole charge of the conclusion of the work under the control of the Committee.

"The book was ready for the press on March 15, 1867, and 20,000 copies were ordered to be printed. In all, 40,000 copies of this edition, which met with universal approval, were sold.

"In 1866 a memorial was presented to the Council from the meeting of the British Association at Birmingham, requesting that the sum of £250 might be placed in the hands of a Committee to be used for the promotion of therapeutical investigations. Upon this it was resolved:—

'That the proposed investigation of the subjects referred to does not come within the province of the General Medical Council, nor, were it in its power, has it any legal authority to expend funds on such enquiry' (Minutes, vol. iv., p. 7).

"A third edition of the work was called for, and prepared in 1885 by a Committee consisting of myself as Chairman, Dr. Aquilla Smith, Sir Henry Pitman, Professor Macnamara, Mr. Collins, Mr. Bradford, and Dr. Haldane. The lamented death of Mr. Warrington since the issue of the previous edition led to the appointment of Professors Redwood, Attfield, and Bentley as editors of the work under the supervision of the Committee. Of this edition 40,562 copies have been sold up to the present time. The amount of profit on the sale of this last edition and the addendum for the last ten years is roughly £1400.

"It must be mentioned that in 1874 an Appendix was prepared, by Dr. Attfield as editor, Professor Redwood's health having then failed, which was inserted in the reprints of the edition of 1867. In 1890 an Addendum to the Pharmacopoeia of 1885 was prepared

by Dr. Attfeld as editor, with the valuable co-operation and assistance of a Committee of the Pharmaceutical Society, and of this work 13,502 copies have, so far, been circulated.

"After an interval of ten years since the last edition of the Pharmacopœia was published, it is proposed to issue a new edition. In this interval very considerable movement has taken place in all the matters which relate to the composition and construction of the Pharmacopœia. It may well be questioned whether that movement is, in all instances, one of progress, but, whether it is so or not, it is the duty of the Council to take care that, in all that relates to it, the work is as accurate and complete as the most diligent research, care, and experience can make it. With a view of obtaining the fullest information on the subject, communications have been addressed to the whole of the licensing authorities, inviting suggestions as to additions, omissions, and emendations, and sixteen of these bodies have responded. The reports with which they have favoured the Council show the great interest and care which they have devoted to the subject. All these reports have been printed for the use of the Pharmacopœia Committee. A request for co-operation in the work was also addressed to the Pharmaceutical Society, which has responded by sending a report on the articles, which in the opinion of its Council should be added to or omitted from the Pharmacopœia. The Council are greatly indebted to the several medical licensing authorities for the assistance which they have thus rendered.

"Communications have also been received from India and the Colonies through official sources. These communications have also been printed for the use of the Committee.

"The interest which the preparation of the Pharmacopœia has excited might be judged by the numerous papers which have appeared in the various journals, and by communications from other sources. It will be the duty of the Pharmacopœia Committee, increased in number if thought fit by the Council, to thoroughly investigate these various communications, of which analyses and summaries have been prepared for their convenience by the Editor. For this purpose it will be necessary for the Committee to hold a special meeting during the summer or autumn as may be most convenient to the members, the fees for which should be as for a meeting of the Executive Committee, according to a former precedent.

"Perhaps I may here point out briefly the conditions under which the Pharmacopœia Committee will have to act. They will have to regard, first, the legal definition of their duties as set forth in the Medical Act; secondly, they will have to regard their duties to the profession, which will require them to decide as to those preparations which should be omitted and those which should be introduced—to repeat a quotation of the remarks of the College of Physicians, to which I have already called your attention, by rejecting medicines of little use, altering formulæ that are absurd and inconsistent, excluding such as savour of superstition, and generally, endeavouring to make the work consonant to reason and experience; they have,

thirdly, to regard the interests and education of pupils who have to make themselves acquainted with the contents of the work. Above all things it is desirable that the Pharmacopœia should not be made a book on therapeutics and pharmacology. To do this would be to introduce a great novelty into the practice of physic; that is, the treatment of disease by Act of Parliament. My conviction is that the forthcoming edition of the British Pharmacopœia will be one worthy of the Council under whose direction it is issued."

ON DROPS.*

BY J. B. HANNAY.

The formation of drops, their variation with the density and chemical composition of the liquids forming them and their variation with temperature and frequency, have been the subject of investigation by several chemists and physicists, but without reaching unanimity as to the definition of a drop, or the cause of its parting from the flowing liquid.

The author referred to the first investigation to define a standard drop and discover the laws regulating its foundation by Guthrie, according to whom a full normal drop could not exist, all drops being more or less imperfect. He found that the quicker the rate of dropping the larger the drop, and this he explained by supposing that when a drop parts from a solid support a portion of the root or stem of the drop is torn back by the attraction of the solid from which the drop falls.

This conclusion the author tested in 1878, by making a liquid drop from itself: (1), by ascertaining if there is variation in the size of drops into which a smooth running stream divides as it falls when the rate is varied; (2), by allowing a liquid to drop from a column of its own substance retained in position by walls to which it does not adhere, for instance, mercury dropped from a clean dry glass tube. Both experiments showed the same variation of size with rate as when dropped from a solid. The theory of a portion being torn back by adhesion was therefore disproved, and the conclusion arrived at was that the neck of a drop forms a tube through which liquid is flowing into the drop, and after a drop begins to fall it receives an accession of liquid during the time taken to complete the rupture of the neck, this accession varying directly as the flow. Thus a conclusion diametrically opposite to Guthrie's is reached, viz., that a true drop is one of which the rate is infinitely slow, and all other drops are greater than a true drop, and not less, as Guthrie concluded. The weight of a true or normal drop is found by determining the difference of weight with rate, and reducing the rate to zero, which then gives the weight of a drop at the moment it begins to part. Experiments with solutions of potassium iodide, potassium nitrate, potassium sulphate, and magnesium sulphate, showed that the size of drops has no connection with the viscosity or internal friction of the solution. Thus, while potassium iodide increases the rate of flow or

* Abstract of a paper read before the Royal Society of Edinburgh on May 6, 1896.

diminishes internal friction, and magnesium sulphate has an opposite effect, yet potassium iodide solution of twice normal strength and magnesium sulphate solution of normal strength form almost identical drops. The conditions under which a drop parts from its root or stem were studied by causing water to drop through oil of different densities and viscosities, and drops of oil were also allowed to rise upwards through water. In this way the influence of viscosity was eliminated.

The size of the normal drop of distilled water in olive oil was 0.4096 C.c. When dropped at the rate of ten seconds to a drop the volume is increased to 0.5611 C.c., while drops formed from a cylinder of water arranged so as to eliminate the effects of gravity is 0.5470 C.c., which shows that the determining factor in the formation and parting of a drop is contractility. Gravity acts by pulling the drop out of its spherical form, the contractile force of the liquid will not permit of this form, but at once starts a constriction which shears through the neck and detaches a drop. The author confirms Tate's observation made in 1864 that "The weight of the drop is sensibly proportional to the diameter of the tube from which it falls, hence the force which holds the drop is a surface one, and not one of general cohesion. It is only an extremely thin envelope of the drop which influences its size and shape." This fact was proved by dropping water at 20° C. into benzine vapour at 37° C., so that the benzine vapour quickly condensed and formed a thin envelope on the water drop. The weight of the normal drop of water being 0.1081 C.c. when dropped in benzine vapour it was reduced to 0.0449 C.c. Traube has shown that in the case of certain organic alcohols and acids the volume of the drops is proportional to their rise in height in the capillary tube. It was found that in the case of the saline solutions already referred to the size of the drop is in close agreement with the capillary constant. The author concludes that the weight of a normal or infinitely slow drop is controlled by its surface tension or contractility, while when dropping in practice it is modified by the rate of flow, by its gravity, the viscosity of the medium in which it drops, and by its rate of fall, all of which affects the lifetime of the closing neck.

A PHARMACY IN CHINA.*

The premises occupied by the Chinese pharmacist usually consist of a shop on the ground floor, a store-room at the back, and a gallery which is reached by a winding staircase leading upwards to the roof, which is flat and forms a terrace; the back room also serves as a laboratory. Both the gallery and the shop, which are connected, are filled with all possible articles relating to pharmacy and surgery. By the side of the gallery are built two smaller rooms, which seem to be equally used as store-rooms and at the same time as sleeping rooms for the assistants. On the terrace itself various herbs and roots are laid out to dry in the sun.

The proprietor of the business does not live on the premises, but spends his leisure time at his house out-

side the town, while the assistants are left in charge of the shop. The streets in China are very narrow, so that the shop is almost always cool throughout the day. The doorway is remarkably high. On the right and left of this a counter extends along the whole length of the shop, terminating at right angles, so that it is impossible for the public to see what the assistants are doing. A row of seats is placed in the body of the shop for the convenience of customers, and the walls are decorated with advertisements and mottoes relating to pharmacy. Of these maxims only a few deserve special record, for instance, a favourite motto is "Two eyes are needful to the druggist when buying drugs, the doctor only needs one eye, and the patient should be blind." Special attention is paid to the furthest end of the shop immediately opposite the entrance. Here the pharmacist places neat rows of porcelain jars, while in between carefully labelled drawers are fitted, and on the top of the whole is an eight-sided urn of tin or some other bright metal, usually surmounted with a board bearing the owner's name. In a corner of the shop stands an altar dedicated to the memory of the owner's ancestors. On it perfumed candles are burnt and a number of the favourite dishes of the departed are spread out. At certain times of the year bits of coloured paper are burnt on the altar, which are supposed to represent different utensils and articles of apparel needful to the deceased in his after-life. This tender thoughtfulness for the comfort of the departed comprises nearly the whole of the Chinaman's idea of religion.

The proprietor is generally seated at the entrance of the shop, from whence he directs the management of his business. All prescriptions are brought to him. He examines them and hands them to his assistants to be made up subsequently. At the entrance, too, all consultations take place, and prices are agreed upon. A Chinese laboratory is not by any means overstocked with apparatus. The whole plant consists merely of a few big marble or granite mortars, a set of sieves, and a couple of fire-bricks; in fact, the Chinese make no distinction between the sciences of chemistry, physics, and natural history. A certain number of chemical preparations are certainly concocted by the native pharmacists, but their manufacture is not based on the slightest scientific principle. Thus, methods of employing specific weights are entirely unknown to the average Chinese operator. A few exceptions may be found among those who have come frequently in contact with Europeans, and may have thus learned to place some value on apparatus and appliances which they have previously despised.

The following recipe for the manufacture of a sublimate was given by Dr. Ivan, a member of the Franco-Chinese mission to the authorities in Paris:—Sulphate of iron, 940 grammes; sulphate of alumina, 920 grammes; potashes, 900 grammes; sulphate of mercury, 120 grammes; an unknown sulphate, 600 grammes; ordinary table salt, 600 grammes; borax, 930 grammes. These ingredients are mixed in a certain order, and are then exposed to fire heat. Of course, from a European standpoint, such a concoction would be condemned as useless. In fact, most of the

* Translated from the *Apotheker Zeitung*.

Chinese prescriptions are only put on paper with a view to calculating the cost of the ingredients. No notice whatever is taken of the proportion or effect of the drugs. Naturally, this method saves our Chinese friend from many of the difficulties with which the European pharmacist has to cope, and his whole method of doing business is on a par with this process. The Chinese classify natural products in the most irregular manner without the least regard for appropriateness. Of course, in a country where the science of pharmacy in all its branches is so imperfectly understood, it cannot be expected that much good can result from its practice, still we must give our Chinese colleagues credit for being very shrewd observers, and for possessing a thorough knowledge of the qualities of all the products which are dealt with in their drug markets. The "Pen-tiao," or Chinese Pharmacopoeia, is almost daily consulted by the Chinese druggist, and is very highly esteemed.

Great care is exercised by the native druggists in collecting and preparing plants and other natural objects. Buds, flowers, roots, and leaves of the same plant are supposed to produce totally different results. The various parts of the plant have, according to the Chinese method, to be collected during certain periods, and at a certain stage of development, so that collecting goes on all the year round. The middle and southern provinces of China are very bare of woods, a circumstance which is probably due to the dense population, which causes all the suitable ground to be used for agriculture. From reports of travellers we gather, however, that the south-western provinces of China are, on the contrary, densely wooded. The mountainous islands of Formosa and Heinan are doubtless well wooded, the former possessing a great number of camphor trees, which furnish, next to Japan, one of the richest sources for the supply of camphor to our markets.

The careful manner in which the Chinese preserve their plants or herbs is evident from the fact that the dried flowers and leaves retain their natural colours in a remarkable degree. The reason of this exactitude may be due to the Chinese belief that the precise effect of various substances is mainly influenced by the manner of their application. For instance, a doctor would usually order medicine to be given either in powder or in pills, or dissolved, because he feels convinced that the effect produced would vary according to the state in which the medicine is exhibited.

In China a chemist will commence his career as an apprentice, and after having served for three years in shop and laboratory will begin his theoretical studies. This training seems to answer in a country where the pharmacist carries on his business more on a trading than on a scientific basis. The Chinese pharmacists form a very influential caste, and much respect and deference is shown to them by the people. For instance, the quarter at Canton where they chiefly reside has been named after them "Physic Street." This name would appear, however, to be only partially appropriate, as only wholesale dealers live there, and they have nothing to do with the dispensing of drugs to the public. The dress of the pharma-

cist is that of the well-to-do classes, consisting of a long cloak reaching down to the ankles, and a large cone-shaped straw hat, covered in summer with horse-hair and with black velvet in winter.

The pharmacists, knowing that their profession is usually associated with the thoughtful and grave physiognomy of the learned, imitate those characteristics, and are found affecting a stoic calmness and adopting a patronising demeanour when talking to the public. Comical are the gestures with which they seek to impress the uneducated with a sense of their mental superiority. The Pen-tiao, or Chinese pharmacopoeia, is divided into fifty-two volumes, which are again sub-divided into numerous parts and chapters; the work seems to treat with the whole creation, and thus affords the student a wide scope for work. The 1st and 2nd volumes describe the origin and growth of pharmacy, the 3rd volume deals with the effects of certain remedies. The 12th to 28th volumes contain a history of the vegetable world, these volumes being classified under eleven heads, which does not speak favourably for the work. The 38th volume is of special interest; in this nothing is discussed but antique furniture, apparatus, and clothes worn by druggists in both past and present times. In the 52nd volume anatomy is dealt with, especially that of those parts which are most likely to require medical treatment.

In Peking, where hawkers and itinerant pedlars are numerous, we find in the streets the medicine cheap-jack and the quack doctor. These people are always surrounded by a crowd, and it is very comical to notice how a quack doctor puts some ointment on his finger and then daubs it under the noses of his audience who are squatting round him, and who without moving a muscle allow the wonderful medicine to have its effect upon them. The effect of rat poison is represented in a very realistic way by its vendors; they spread out on a piece of blue cloth on the floor their bottles, etc., and in front of these they place a number of dead rats.

ANALYTICAL NOTES.

NEW REACTIONS FOR MORPHINE.—The fact that certain ptomaines produce with nitric acid and other tests colour reactions which closely resemble those of morphine, while the various phenols also nearly resemble the ferric chloride reaction, has induced M. Bruylants to experiment further in this direction. Thus he modifies Fröhde's test, and combines with it the test of Huseman in the following manner:—A portion of the alkaloidal residue is dissolved in sulphuric acid in a watch glass; a little of this solution is placed on the surface of a white tile and a trace of Fröhde's reagent containing 1 centigramme of molybdate in each cubic centimetre of acid is added, when the well-known lilac tint is produced. Then the watch glass and its contents are warmed on the water bath, another portion is taken up and treated while warm with the same reagent. In the warm solution, a fine green colour is obtained. This established, a minute particle of nitre is dropped into the green solution, when the tint immediately changes from green to red, slowly

fading and becoming yellowish. The author enumerates experiments with the other opium alkaloids, which give marked colours when tested by the same successive tests, but which, however, are quite distinct from those obtained in this manner from morphine. Further, on adding a trace of solution of iodic acid to a warm solution of morphine in sulphuric acid, a lilac tint, passing slowly to red, is obtained; with more of the reagent a red colour is immediately produced (*Journal de Pharm.*, May 1, 1895).

FLUORINE IN BEER.—Stefelmann and Mann detail a method for the detection of minute quantities of fluorine in beer as a preservative, of which König's antiseptic salt, consisting of 85 per cent. hydrofluosilicic acid, and 15 per cent. acid ammonium fluoride has been vaunted. From the beer, freed from carbonic acid, the fluorine is precipitated by calcium and barium chlorides, and used for the production of hydrofluoric acid, which is allowed to etch a watch glass; if the etching is only very faint the glass must be breathed upon (*Ph. Centralhalle*, xxxvi., 249).

TESTING BALSAM OF PERU.—Regarding the nitric acid test and other methods for testing Peruvian balsam unsatisfactory, Messrs. Gehe and Co. have found the determination of the percentage of cinnameln and the saponification number a valuable method in testing this article. A series of experiments on some fifty samples show that in genuine balsams the proportion of cinnameln lies between 57 to 60 per cent., the saponification equivalent being from 235 to 238. If a balsam shows results differing from these figures it can be pronounced as adulterated with certainty; if the saponification number is right and the proportion of cinnameln too low, the sample is at least of inferior quality. The test is applied thus:—About 5 grammes of the balsam is shaken, 5 grammes of water and an equal quantity of official solution of soda. The cinnameln is then extracted by washing with three successive 10 grammes of ether. The ether is evaporated on a water bath, and the cinnameln weighed. The ether takes some time to volatilise, it is therefore necessary to make successive weighing, the final one being taken when the loss is not more than 1 centigramme in five minutes. To the weighed residue 35 to 40 C.c. of semi-normal alcoholic potash solution is added, and about 20 C.c. of alcohol; this mixture is saponified on the water bath, and the amount of uncombined alkali determined by means of semi-normal acid solution (*Pharmaceutische Centralhalle*, April 25, 1895).

REDUCTION OF FEHLING'S SOLUTION BY SULPHONAL.—Lafon calls attention to the error which may occur when examining the urine of patients undergoing treatment with sulphonal, since the excretion under these conditions gives, with Fehling's solution, a reduction precisely similar to that due to sugar, although optical examination by the polarimeter may show it to be absolutely free from dextro-rotatory power, and therefore free from glucose (*Comp. rend.*, vol. 120, p. 938).

ASSAY OF NARCOTIC EXTRACTS.—L. von Ittala publishes the following modification of his method of assaying narcotic extracts:—Three grammes of extract are dissolved in 20 C.c. of water with the aid of 3 drops of dilute sulphuric acid (1:6); to this 10 C.c. of acetate of lead solution (1:10) is added, and after allowing the precipitate to settle, 16 C.c. is filtered off. To this 40 C.c. of a mixture of 75 grammes of ether and 25 grammes of chloroform are added, together with 4 C.c. of solution of ammonia. The whole is well shaken for one minute, the ether-chloroform layer made up to its original volume, and again shaken for one minute. Twenty-five C.c. of the ether-chloroform layer is then separated, evaporated, and the alkaloid determined volumetrically. In a mixture containing 0.855 per cent. of alkaloid this method indicated 0.818 per cent., whilst Dieterich's process showed 0.8185 per cent. (*Apotheker Zeitung*, and *Pharm. Post*, xxviii., 236).

CULTIVATING SPONGES.

Sponge farming has been found to be a very profitable industry, and at present there are hundreds of acres in the Gulf of Mexico, along the Florida coast, devoted to this novel purpose. The attempt to grow sponges was first made when it was discovered that the sponge fisheries of the Bahamas and the gulf coast of Florida showed signs of becoming exhausted. It has since been found that under proper cultivation sponges may be raised which are superior in quality and command higher prices than those found at sea. The site for a sponge farm is usually some arm of the sea where the salt water flows in freely. The only preparation necessary is to drop in rocks, stones, and other substances for the sponges to fasten themselves to and to dam up the lagoon so that the sponge seeds cannot be blown out to sea. The farms at first obtained their supplies of sponge seeds from the Fish Commissioners, but latterly they obtain them directly from the sponge fisheries. In the autumn of the year the various varieties of sponges are purchased by the sponge farmer, care being taken to secure both the male and female cells. The sponge seeds are generally kept in small "pounds" during the winter months, and here the masses of protoplasm develop and grow. The spores are liberated early in the spring. They swim about, the eggs grow rapidly and soon attach themselves to the rocks or coral at the bottom of the water. The sponge farm requires little attention after it is once started. The sponges grow slowly, and, as a rule, none are pulled up till the end of the third year. The largest sponges are then gathered, and the smaller ones are left to produce new seeds and grow to a larger size. The sponges may be readily gathered on sponge farms, since the water is usually shallow and smooth, and the dangers of ordinary deep-sea sponge fishing are not encountered. The finest sponges raised in this way are said to sell for from \$1.50 to \$3 per pound. If no diseases or enemies get into the sponge beds, the sponges yield large crops year after year. The yearly income from the sponge farm is said to range from \$1000 to \$10,000, according to its size, location, and age.—*Scientific American*.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JUNE 8, 1895.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to the Publishers, 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders should be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brembridge, —17, Bloomsbury Square, London, W.C.

THE COUNCIL MEETING.

At the first meeting of the newly-elected Council the chair was taken by Mr. CARTEIGHE, and after the confirmation of the minutes of the preceding meeting the Chairman formally introduced the two new members, Mr. CORDER, of Norwich, well known as having been for many years an active member of the Board of Examiners, and Mr. SAVORY, less well known personally, but the representative of a name very familiar to the older members of the Society.

On a ballot being taken for the election of President, the choice of the Council fell upon Mr. MICHAEL CARTEIGHE, who, in taking the chair, expressed his sense of the honour they conferred upon him, adding also that in again accepting the position of President he was influenced solely by the belief that he should be furthering the interests of the Society.

In the ballot for Vice-president Mr. JOHN HARRISON was elected by a very large majority of votes, a result which he spoke of as a gratifying surprise to himself, but sufficiently perilous to make him hope that in discharging the duties of the office he would have an extension of the kindness which had led his colleagues to place him in that honourable position.

In the ballot for Treasurer Mr. ROBERT HAMPSON was re-elected to that office, and in acknowledging the compliment, spoke of the interest he took in the affairs of the Society and his desire to continue it.

On the motion of Mr. HILLS, seconded by Mr. CORDER, it was resolved that the thanks of the Council be tendered to Mr. W. GOWEN CROSS for his valuable services as Vice-president during the

past three years. Though residents in London might not generally appreciate the personal exertion and occupation of time involved in the attendance at Council and Committee meetings by a resident in the country, Mr. HILLS felt especial pleasure in proposing this resolution on that account and because of the loyalty and courtesy evinced by Mr. CROSS both to the Society and to his colleagues.

After the formal re-enactment of the standing orders of the Council the officers were appointed for the ensuing year, Mr. RICHARD BREMBRIDGE being re-appointed Secretary and Registrar, Mr. J. R. HILL, Assistant-Secretary, and Mr. E. M. HOLMES, Curator of the Society's Museum. Messrs. FRANKLAND, RANSOM, and SEWARD were appointed examiners for the Council prizes, and Messrs. HOLMES, TANNER, and PINCHES as examiners for the Jacob Bell Memorial and Manchester Scholarships.

The additions to the Society comprised two pharmaceutical chemists, and two chemists and druggists as members, thirteen associates, and fifteen students.

In referring to the retirement of Mr. THOMAS GREENISH from the Council, Mr. HAMPSON moved that an expression of regret, accompanied by acknowledgment of his long services in the capacity of Member of Council and as Treasurer should be addressed to Mr. GREENISH. This was seconded by the PRESIDENT and carried unanimously.

The PRESIDENT also read a letter from Mr. H. N. B. RICHARDSON, thanking the Council on his father's behalf for the resolution passed at the last meeting of Council.

A letter from Sir RICHARD QUAIN, as President of the General Medical Council, was read by the PRESIDENT, in which the Council was thanked for the list of suggested additions and omissions from the new Pharmacopœia (see *ante*, p. 1063), and also for the statistics forwarded by the PRESIDENT at Sir RICHARD QUAIN's request.

In mentioning the recent death of Dr. H. F. C. CLEGHORN, of St. Andrews, who had been an honorary member of the Society since 1856, and had taken much interest in the Society's work in Scotland, the PRESIDENT suggested that a letter of condolence should be sent to his relatives.

The various working Committees were then appointed as usual, and the Council proceeded to the ordinary routine business.

The report of the Finance Committee was of the usual nature for this time of the year. On the donation account of the Benevolent Fund there is a sum of about £400 awaiting suitable investment.

On the recommendation of the Benevolent Fund Committee, one grant of fifteen pounds, two grants of ten pounds each, and two of five pounds each were ordered to be paid, but the Chairman of the

Committee, Mr. CROSS, said the report did not call for special comment.

The report of the Library, etc., Committee gave the usual account of attendances at the Library and Museum, of donations, and of purchases of books recommended. In moving its adoption, the PRESIDENT mentioned the presentation of a crayon portrait of the late DANIEL HANBURY, which is of especial interest as being the best likeness of him extant. This portrait will be placed in that portion of the Society's Museum which is devoted to the HANBURY collection.

It was resolved that the Committee should make the necessary arrangements for the inaugural address to be delivered at the commencement of the Autumn Session, and report thereon to the Council.

A communication from Mr. LAIDLAW EWING, the Chairman of the North British Branch Executive, relating to the further work to be done in the Society's premises in Edinburgh, was referred to the Committee for consideration.

Letters were also read from Mr. BELL, the Honorary Secretary of the Hull Chemists' Association, and from Mr. EBERLIN, the Honorary Secretary of the Nottingham and Notts Chemists' Association, thanking the Council for the gift of the Journal and Calendar.

The subject of the Research Laboratory was considered in committee, and it was resolved that a special Committee should inquire into this matter and report to the Council in July.

The report of the General Purposes Committee gave an account of the progress made with cases in the solicitors' hands, and instructions were given to take proceedings in certain instances reported upon.

GENERAL MEDICAL COUNCIL.

At the meeting of the General Medical Council on Thursday last, the first business upon the programme for the day was the presentation of a report from the Pharmacopœia Committee. In anticipation of the publication of the report *in extenso*, it may be stated that the Committee suggests as desirable that, in connection with the work of pharmacopœia revision, the services of scientific referees in Chemistry and Botany should be obtained. For that purpose it was proposed to invite the assistance of Mr. THISELTON DYER and Mr. HOLMES as referees in Botany, and Dr. THORPE or Dr. RUSSELL as referee in Chemistry. The assistance of recognised authorities in Pharmacology and Therapeutics is also considered by the Committee to be desirable, in order that points of difficulty in connection with the properties of particular drugs and preparations may be referred to them. It is suggested that Dr. LAUDER BRUNTON, Professor

FRASER, and Professor WALTER SMITH should be requested to act as referees on these subjects.

Mention was made of the fact that the Pharmaceutical Society of Great Britain has, by request of the Medical Council, appointed a committee of pharmacists to assist in the work of revision, also that a list of questions bearing on pharmacy has been drawn up by the Pharmacopœia Committee for reference to the Council of the Society.

In addition to the communications already received from medical authorities in reply to applications for information bearing upon the work of revision, it was stated that a memorandum furnishing important information as to the frequency with which official drugs and medicinal preparations are used, has been received from the Therapeutic Committee of the British Medical Association, that a pamphlet giving similar information has been forwarded by Mr. MARTINDALE, and that an instructive report, with statistics, has been supplied by the Pharmaceutical Society. Information of value on various subjects has also been received from other sources, and the Pharmacopœia Committee expresses, on behalf of the General Medical Council, its thanks for these communications.

The information received from medical and pharmaceutical authorities in the Colonies and India has been summarised by Professor ATTFIELD, as well as the suggestions of the various medical authorities, so that the Committee has now before it a mass of information from many sources, arranged in a convenient form for reference. In order to deal with the materials before the Committee, it is proposed to hold a meeting in London towards the end of July for considering the preparation of the first draft of the new Pharmacopœia.

At the invitation of the Committee, Dr. TIRARD has consented to act as Secretary and to render assistance to the President in matters relating to the preparation of the new edition of the Pharmacopœia.

The ninth annual report on the progress of pharmacy has been submitted by Professor ATTFIELD, and the Committee has directed it to be printed, together with an index to the whole series of these reports.

On the motion of Dr. LEECH, seconded by Mr. BRUDENELL CARTER, the report was adopted.

In reply to a question as to the payment to be made to Professor ATTFIELD and to the referees named in the report, the President said that beyond the arrangement already made the uncertainty as to the extent of the work required made the exact settlement of remuneration impossible at present, and that matter must be left to the discretion of the Committee.

REVISION OF THE B.P.

IN commenting upon Sir RICHARD QUAIN'S address to the General Medical Council (see p. 1119), the *Lancet* remarks that if he shows himself a little conservative in regard to the conditions of editorship and preparation of the Pharmacopoeia, it is impossible to deny that he speaks with a rare experience and a large responsibility. With regard to the pending revision of the work, our contemporary states that, though it is undoubtedly expected that the new pharmacopoeia will mark a step in advance of the present one, it must yet be conceded that the present volume has creditably sustained its place in the estimation of both medical practitioners and pharmacists. "It is easy to find fault with it—to show that it has left undone that which it ought to have done, and in particular has done that which it ought not, but, as a whole, it is a creditable starting-point for a new edition. We trust that the editorial arrangements in the entertainment of new drugs will carefully avoid both errors—'raw haste' and undue delay. This does not imply any very great change in the aspect of the book, but it may imply a great advance in its utility, and may place it in a much more favourable position as respects the rival volumes which enterprising druggists publish as amateur performances in the nature of pharmacopoeias." Surely this last sentence is an unkind cut at works which a large proportion of the profession represented by the *Lancet* use in preference to the official guide. Possibly, however, the writer of the article has been stirred to exaggeration by the numerous baseless attacks on a volume which has served its purpose well, and is not yet so out-of-date as many of its self-appointed critics would have us believe.

SCIENCE AT THE MINT.

THE twenty-fifth annual report of the Deputy-Master of the Mint contains a memorandum by Mr. ROBERTS-AUSTEN, C.B., F.R.S., who announces that an elaborate research on the diffusion of liquid metals in each other has just been completed, after ten years' work, and will shortly be communicated to the Royal Society. By means of the recording pyrometer information has been obtained as to the molecular changes which take place in a mass of metal from the moment it begins to cool until it is solid, and afterwards. The result of a number of experiments is that an important generalisation has been arrived at with regard to the connection between the tensile strength of metals and the temperature at which metallic and other bodies in them become solid. Thus, if the solidifying point of the added element is much lower than that of the mass, the metal as a whole will be greatly weakened, while in the contrary case the metal will be strengthened, often to a remarkable extent. Dr. ROSE has continued and almost completed his investigation into the relation between gold and chlorine, and details of the experiments will shortly be submitted to the Chemical Society. He finds that the metal can be converted into chloride and distilled in a current of dry chlorine, at all temperatures between 150° and 1100° C. Gold trichloride begins to decompose in air at about 70° C., its pressure of dissociation being just perceptible at that temperature. But the decomposition of the chloride is slow at all temperatures below 180°.

Transactions of the Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL.

Wednesday, June 5, 1895.

Present—

Messrs. Allen, Atkins, Bottle, Carteighe, Corder, Cross, Gostling, Grose, Hampeon, Harrison, Hills, Martin, Martindale, Newholme, Savory, Schacht, Southall, Warren, and Young.

Mr. MICHAEL CARTEIGHE took the chair.

The minutes of the last monthly meeting and of the special meeting on May 22 were read and confirmed.

NEW MEMBERS OF THE COUNCIL.

Mr. CARTEIGHE said, as an old President, he should be glad formally to introduce to the Council the two new members who had been elected to it. Mr. Corder was well known as for a long time an active member of the Board of Examiners, and Mr. Savory, although not personally so well known to the trade, would be a familiar name to the earlier members of the Society. Both his father and grandfather were personally known to him (Mr. Carteighe), and he was glad to welcome a grandson of one of the founders of the Society and a former president.

ELECTION OF PRESIDENT.

On the ballot being taken in the usual way,

MR. MICHAEL CARTEIGHE

was re-elected President.

The PRESIDENT said he felt it a very great honour to be, after so many years' service, re-elected by a practically unanimous vote. He recognised the spirit in which the offer was made, and felt that he was bound to accept the honour, believing that he should be furthering the interests of the Society in so doing. For that reason only did he gratefully accept the honour conferred upon him.

ELECTION OF VICE-PRESIDENT.

The ballot having been taken,

MR. JOHN HARRISON

was elected Vice-President.

The VICE-PRESIDENT said this election was one of the greatest surprises of his life, but was none the less gratifying. It had always been a great pleasure to him to be a member of the Society, but he had hardly ventured to look forward to occupying the vice-chair. It had been occupied by many men of far superior attainments to himself, and he felt that though he succeeded to a precious heritage it was also a perilous one. At the same time he ventured to hope that the same kindness which had led his colleagues to place him in that honoured position would be extended to him in his endeavours to discharge its duties, which he hoped to do to the satisfaction of the Council.

ELECTION OF TREASURER.

On a ballot being taken,

MR. ROBERT HAMPSON

was re-elected Treasurer for the ensuing year, and that gentleman acknowledged the compliment in a few words to the effect that he hoped to continue the interest he had always taken in the affairs of the Society.

THANKS TO THE VICE-PRESIDENT.

Mr. HILLS asked permission to propose a resolution that the hearty thanks of the Council be tendered to Mr. W. Gowen Cross for his valuable services as Vice-president during the past three years. As a resident in London he had special pleasure in proposing this resolution. Those living in the metropolis at a short distance from Bloomsbury Square did not always, he suspected, realise the amount of time spent by members of the Council residing in the country in order to take part in their deliberations. Mr. Cross, living at a considerable distance from town, must during the past three years have spent very many hours in railway travelling, and all present would the more appreciate this when he reminded them that Mr. Cross in his own borough occupied the highest office attainable by a citizen, namely, the honourable and dignified position of mayor. That office must necessarily engage a good deal of his time, but in spite of other engagements Mr. Cross had almost invariably found time to give the Council the benefit of his assistance. Those who had worked with him knew that, whilst not a great talker, he exercised a large amount of common-sense combined with *bonhomie* in their deliberations, and his loyalty and courtesy both to the Society and his colleagues were proverbial.

Mr. CORDER, in seconding the proposal, said he could from personal experience cordially testify to the services of Mr. Cross, and endorse all that had just been so well said of him.

Mr. BOTTLE: We all share in Mr. Corder's opinion.

The PRESIDENT said he should like to take the opportunity of expressing not only his indebtedness to Mr. Cross on behalf of the Council, but his own personal feelings of regard and affection, especially as it bore upon the assistance he had rendered to him as President. There were many things in which the President found it a relief to be able to depend on the cordial co-operation and assistance of the Vice-president, and he could pay no higher compliment to Mr. Cross than to say that whenever he had desired his help in the official work of the Council he had invariably rendered it gladly.

Mr. CROSS, in acknowledgment both of the proposal and of its unanimous and cordial reception by the Chairman, said it would ill become him to say that he felt a sense of relief at being released from the trammels of office. He was, however, conscious that an office such as he had held involved certain responsibilities which he was gratified to think he had been able to discharge somewhat to the satisfaction of his colleagues, as testified by this cordial vote of thanks. Should he be thought to have discharged the

duties in any way as a worthy follower of the distinguished men who had preceded him in the vice-chair it would be to him a source of gratification throughout his life. He need hardly say that in the occupancy of the vice-chair he had endeavoured to sink all personal feeling in the one aim and design of benefiting the good old Society with which they were all identified, and for which, he believed, they were ready to make any reasonable sacrifice.

STANDING ORDERS.

The standing orders of the Council were re-enacted for the ensuing year.

SECRETARY AND REGISTRAR.

Mr. RICHARD BREMEIDGE was re-appointed Secretary and Registrar for the ensuing year.

EDITOR AND SUB-EDITOR OF THE JOURNAL.

Dr. B. H. PAUL was re-appointed Editor and Mr. JOHN HUMPHREY Sub-Editor of the Journal for the ensuing year.

CURATOR.

Mr. E. M. HOLMES was re-appointed Curator of the Society's Museum for the ensuing year.

ASSISTANT-SECRETARY.

Mr. J. R. HILL was re-appointed an Assistant-Secretary of the Society for the ensuing year.

EXAMINERS FOR THE COUNCIL PRIZES.

Messrs. FRANKLAND, RANSOM, and SEWARD were appointed to conduct the examination for the Council Prizes competition in July next.

EXAMINERS FOR THE JACOB BELL SCHOLARSHIPS.

Messrs. HOLMES, TANNER, and PINCHES were appointed to conduct the examinations for the Jacob Bell Memorial and Manchester Scholarships.

ELECTION OF MEMBERS.

Pharmaceutical Chemists.

The following, having passed the Major examination and tendered their subscriptions for the current year, were elected "Members" of the Society:—

Foden, Thomas Henry Forest Hill.
Scott, George L. Manchester.

Chemists and Druggists.

The following, who were in business before August 1, 1868, having tendered their subscriptions for the current year, were elected "Members" of the Society:—

Fletcher, Samuel Burnley.
Palmer, John Main Clapham.

ELECTION OF ASSOCIATES IN BUSINESS.

The following having passed the Minor examination, being in business on their own account, and having tendered their subscriptions for the current year, were elected "Associates in Business" of the Society:—

Blankley, Frank Fernlough ... Chatteris.
Davies, David Pontypridd.
Douthwaite, John Prudhoe-on-Tyne.
Lister, Robert Leeds.
Stevenson, Andrew Rangoon.

ELECTION OF ASSOCIATES.

The following, having passed the Minor examination, and tendered, or paid as "Students," their sub-

scriptions for the current year, were elected "Associates" of the Society:—

Armbrrecht, Ernest Louis N....	London.
Bennie, John Wood	Paisley.
Diawoodie, James Herbert	Lochmaben.
Lee, Arthur	Torquay
Lilly, Arthur	London.
Rowell, Thomas Bell	Newcastle-on-Tyne.
Shorthouse, Herbert Stephen..	Birmingham.
Wharram, Thomas Barnard	Naburn.

ELECTION OF STUDENTS.

The following, having passed the First examination and tendered their subscriptions for the current year, were elected "Students" of the Society:—

Cox, John Wilfred	Rotherham.
Finlayson, William	Stockton-on-Tees.
Green, Hugh	Darlington.
James, James Llanvair	Llanelly.
Jones, Robert Frederick	Hull.
Jordan, Ernest Samuel	Exeter.
Laidlaw, Robert	Anorurn.
Rainey, Robert Martin	Leeds.
Rogers, Alford	Llanelly.
Rogers, Henry John M	Pembroke.
Rowe, John Westaway	Wrexham.
Salthouse, Edward	Blackpool.
Tatler, Albert Edward	Hauley.
White, Thomas William	Stirling.
Wilson, Erasmus Philip	Bath.

Several persons were restored to their former status in the Society upon payment of the current year's subscription and a nominal restoration fee of one shilling.

RESTORATIONS TO THE REGISTER.

The names of the following persons were restored to the Register of Chemists and Druggists:—

Edward James Lawson, 86, St. James' Road, Holloway, N.

George Wilton, 31, The Pavement, Clapham, S.W.

THE RETIREMENT OF MR. THOS. GREENISH.

Mr. HAMPSON said he could not help feeling the absence that morning of their old friend, Mr. Greenish, who was now seeking by a voyage to restore his somewhat impaired health. He was sure that all around that table would gladly join in passing a vote of thanks to him for his long services, and he believed Mr. Greenish would be glad to know that he had been remembered that day. He would therefore move—

"That this Council desires to express its regret at the retirement of Mr. T. Greenish, who, as a member of the Council for twenty-four years, as Treasurer of the Society, and as President, has with unabated energy devoted his conspicuous abilities to the service of the Society. His colleagues beg to assure him of their good wishes, and they trust that his health may long permit him to follow with interest the progress of the Society for which he has laboured so long."

The PRESIDENT said he should like to second this proposition. He had had the most intimate association with Mr. Greenish for many years, and found him a typical pharmacist, of whom they might well be proud. He sincerely regretted to find himself

without Mr. Greenish's assistance, not only on the Council, but on the various committees.

The resolution was carried unanimously.

THE RESIGNATION OF MR. RICHARDSON.

The PRESIDENT read a letter which he had received from Mr. H. N. B. Richardson, thanking the Council, on his father's behalf, for the resolution passed at the last meeting]

THE MEDICAL COUNCIL.

The PRESIDENT also read a letter he had received from Sir Richard Quain, President of the Medical Council, acknowledging with thanks the receipt of the list of suggested additions to and omissions from the new Pharmacopoeia, and also for certain statistics which he (the President) had at his request forwarded to him.

DEATH OF AN HONORARY MEMBER.

The PRESIDENT said he regretted to announce the death of Dr. H. F. C. Cleghorn, of St. Andrews, who had been an hon. member since 1856. He knew a little of his work, but was not acquainted with him personally. He was highly appreciated in the north; and he (the President), was informed by Mr. McEwan that he often used to visit the Society's premises in Edinburgh, and kept the Society in mind when the Forestry Exhibition was open. It would be only right, he thought, that he should write a letter of regret and condolence to Dr. Cleghorn's relatives.

This suggestion was agreed to.

APPOINTMENT OF COMMITTEES.

The Council went into Committee to consider the arrangement of the different committees, as the result of which the following arrangements were made:—

General Purposes: The whole Council to meet on the evening before the meeting of the Council, and at such other times as may be necessary.

Finance: The President (Mr. Carteighe), the Vice-president (Mr. Harrison), and Messrs. Allen, Grose, Hills, Martin, Martindale, Newsholme, Savory, and Schacht.

Benevolent Fund: The President (Mr. Carteighe), Vice-president (Mr. Harrison), and Messrs. Atkins, Bottle, Corder, Cross, Gostling, Hampeon, Johnston, Southall, Storrar, Young, and Warren.

Library, Museum, School, and House: The President (Mr. Carteighe), vice-president (Mr. Harrison), and Messrs. Allen, Atkins, Bottle, Hampeon, Hills, Martin, Martindale, Newsholme, Savory, Schacht, and Warren.

Law and Parliamentary: The President (Mr. Carteighe), Vice-president (Mr. Harrison), and Messrs. Allen, Atkins, Bottle, Cross, Hampeon, Hills, Johnston, Martindale, Savory, Southall, Storrar, Young, and Warren.

Evening Meetings: The Staff of the Society's School, the Editor, and the Curator, were requested to assist the President and Vice-president in making arrangements for the Society's evening meetings in London.

REPORT OF THE FINANCE COMMITTEE.

The SECRETARY read the report of this Committee, which was of the usual character, and recommended sundry accounts for payment.

The PRESIDENT (as Chairman of the Committee) moved the adoption of the report and recommendations. There was nothing calling for special remark, either with regard to the receipts or expenditure. On the Benevolent Fund Account the receipts during the month had been about £240, and he feared that the time of year had now come when there would only be small monthly receipts in the shape of subscriptions. He had not made a comparison with former years, but hoped the condition of things was satisfactory. The Orphan Fund remained practically as it was, and also the Donation Account, which still stood at about £400. The Committee did not recommend that this should be invested at present, as it was hoped that a suitable parcel of ground rents would be found before long. He should have said that a small donation of 30s. had been received from the Chemists' Assistants' Association, being the surplus arising from a social evening.

The resolution was unanimously agreed to.

REPORT OF THE BENEVOLENT FUND COMMITTEE.

The report of this Committee included a recommendation of the following grants:—

£10 to a former associate (68) who has had seven previous grants; the last in June, 1894. (London.)

£15 to the widow (46) of an associate who has had three previous grants of like amount, which have been devoted to the maintenance and education of two of her children, being this grant for the same purpose. (London.)

£10 to a registered chemist and druggist (77), unable to do anything on account of age. (Cambridge.)

£5 to an associate (52) from 1869 to 1894. He had a grant of £10 in June, 1894. (Brighton.)

£5 to a registered chemist and druggist (54) at present out of employment, but hopes soon to be able to do something. He had a grant of £10 in May, 1894. (Luton.)

One other application the Committee declined to entertain.

Mr. CROSS (as Chairman of the Committee) moved the adoption of the report and recommendations, which he said called for no special comment.

The report and recommendations were unanimously adopted.

THE LIBRARY, MUSEUM, SCHOOL, AND HOUSE COMMITTEE.

Library.

The report of the Librarian had been received, including the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
April . .	{ Day . .	268	21	5	12
	{ Evening .	118	10	2	6
Circulation of Books.		Total.	Town.	Country.	Carriage paid.
April		196	103	93	£1 4s. 9d.

Donations to the Library had been announced (*Pharm. Journ.*, May 18, p. 1031), and the Com-

mittee had directed that the usual letters of thanks be sent to the respective donors.

The Committee had recommended that the under-mentioned works be purchased:—

Chemical Technology, edited by Groves and Thorp vol. 2.

Sadtler and Trimble's Pharmaceutical and Medical Chemistry.

Extra Pharmacopoeia, 8th edition.

Museum.

The Curator's report had been received, and included the following particulars:—

Attendance.		Total.	Highest.	Lowest.	Average.
April . . .	{ Morning	279	25	4	12
	{ Evening	23	5	1	1

Donations to the Museum had been received (*Pharm. Journ.*, May 18, p. 1031), and the Committee had recommended that the usual letters of thanks be sent to the respective donors.

The PRESIDENT, in moving that the report and recommendations be received and adopted, said the principal portion of the report was merely formal, but members would be glad to hear that Mr. Thomas Hanbury had presented the Society with an excellent crayon portrait of the late Daniel Hanbury, which was probably the best presentment of him extant. The Committee thought it would be very appropriately placed in that portion of the Museum where the Hanbury collection was located.

The report and recommendations were unanimously adopted.

THE INAUGURAL ADDRESS.

It was resolved that the selection of a gentleman to deliver the Inaugural Address at the commencement of the Autumn Session should be referred to the Library, Museum, School, and House Committee.

THE NORTH BRITISH BRANCH.

The PRESIDENT, said Mr. Ewing, who was in town on the occasion of the Annual Meeting, presented to the Secretary an account of what had been done at the Society's premises in Edinburgh, showing a small balance still due, but he also stated that the Committee of the Branch had been considering the desirability of making some change in the lower rooms of the old building, to put the secretary's office and library upstairs, and to have the museum below, and desired that the Council should consider the matter and give the Committee authority to make the alterations desired. Plans and estimates had been prepared, and he would suggest that they should be submitted to the Library, Museum, School, and House Committee for consideration and report.

This was unanimously agreed to.

CORRESPONDENCE.

The PRESIDENT said a letter had been received from Mr. Bell, honorary secretary of the Hull Chemists' Association, stating that they had passed a resolution heartily thanking the Council of the Pharmaceutical Society for the gift of the Journal for the past year. A similar letter had been received from Mr. Eberlin,

honorary secretary of the Nottingham and Notts Chemists' Association, thanking the Council for the gift of the Calendar and Journal.

THE RESEARCH LABORATORY.

The Council having gone into Committee for a short time, on resuming it was resolved—

“That a Special Committee of the Council be appointed (1) To inquire into and report to the July Council to what extent the objects aimed at in the equipment of the Research Laboratory have been attained. (2) To report any suggestions that may occur to them for the conduct of the Laboratory for the future.

“That the Special Committee consist of the President, Vice-president, and Messrs. Allen, Atkins, Bottle, Gostling, Hampeon, Hills, and Martindale.”

REPORT OF GENERAL PURPOSES COMMITTEE.

The Council, as usual, went into Committee to consider this report, which included the usual letter from the solicitors as to the conduct of cases placed in their hands.

On resuming, the report and recommendations of the Committee were adopted, and resolutions passed authorising proceedings to be taken against certain persons named therein.

Proceedings of Societies in London.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

(Continued from page 1103.)

Mr. E. Goulding, Reporter on Botany, then gave the following:—

REPORT ON BOTANY.

BY E. GOULDING.

The first recent botanical research to which I wish to invite your attention is the work of Mr. F. F. Blackman, on the paths of gaseous interchange between aerial leaves and the atmosphere.* By means of a most elaborate and ingeniously contrived apparatus he has obtained some very important results.

On the question of the passage of carbon dioxide into the leaf in assimilation and out of it in respiration widely different views have from time to time been held. The older botanists regarded the stomata as the paths by which it was effected, whilst in later years it has been held that the stomata play no part in the process, but that the cuticle is the medium by which the gas is conveyed. Direct experimental proof has been very difficult to obtain owing to the smallness of the quantities of gas involved, and for this reason no attempt has been made previously to determine them by direct estimation. Shortly after Graham had published the results of his experiments on the diffusion of gases through permeable media, Barthélemy, on account of the readiness with which carbon dioxide can diffuse through caoutchouc, and

the similarity of cuticle to caoutchouc in chemical composition, advanced the theory that the exchange of gases between leaves and the atmosphere was a cuticular phenomenon. This view was apparently confirmed by a series of experiments carried out by Boussingault in the same year (1868). His work seemed to show that in assimilation the carbon dioxide absorbed by the leaf enters through the upper surface devoid of stomata, to which the assimilating cells are adjacent, rather than through the stomata of the lower surface. These experiments were conducted upon the leaf of oleander.

By a leaf having an upper surface of 37.2 square centimetres, free from stomata, and completely closed on the under side by tallow, 17.5 C.c. of CO₂ were absorbed in a given time. In another series of experiments Boussingault fastened the under surfaces of two leaves closely together by means of paste, so that only the upper surfaces (free from stomata) were exposed to the air; with these leaves nearly the same results were obtained as in the first series.

He also found that leaves with open stomata absorbed less carbon dioxide than those in which the stomata were blocked up with wax. From these experiments Boussingault drew the obvious conclusion that in the process of assimilation the carbon dioxide normally passes into the leaf through the cuticle of the upper surface.

Blackman has shown, however, that this deduction is entirely fallacious. It has been found that the oleander leaf can best assimilate carbon dioxide when largely diluted with air. Boussingault, however, carried out his experiments in an atmosphere containing as much as 30 per cent. of carbon dioxide, and hence the erroneous conclusions at which he arrived. The true reason of his results is now apparent. The leaves with the open stomata assimilated less carbon dioxide simply because so much was present that their assimilatory activity was checked, or, in other words, the leaves were choked. In those leaves in which the stomata were closed by tallow, the carbon dioxide diffused so slowly through the cuticle that the assimilation was able to proceed normally, and thus more of the gas was absorbed than in the former case. Blackman has conclusively proved that this is the case by a series of experiments in currents of air containing varying proportions of carbon dioxide. He has found that a leaf with open stomata in an atmosphere containing a small percentage of carbon dioxide assimilates more than a leaf with its stomata blocked up, this result being just the reverse of those published by Boussingault.

Blackman has conducted his experiments by means of a most elaborate and complicated apparatus, the main features of which I will briefly point out.

The leaf under examination is furnished with shallow capsules, 10 square centimetres in area, consisting of a glass plate with a metal rim, through which tubes for the circulation of the air current pass. These are attached to the leaf on opposite sides of the same area by means of soft wax. Then over these portions of leaf a continuous current is kept up. The currents

* *Proc. Roy. Soc.*, pp. 162-168.

are generated by aspirators specially arranged to work steadily with small rates of flow (50 to 100 C. c. per hour). The gases enter the apparatus either through an arrangement for removing carbon dioxide, when working on respiration, or through one for adding CO₂ when working on assimilation. To remove the CO₂ the air is drawn through a tower full of beads, over which a stream of strong potash flows continuously. The CO₂ generator consists of a tall tube containing fragments of marble, through which the air-current passes at a constant rate, while very dilute hydrochloric acid trickles down it at an extremely slow rate, which is made constant by special arrangements. From the CO₂ generator or remover, as the case may be, the current of air passes to the receivers in which the portions of leaf are situated. The estimation of the carbon dioxide at the close of the experiment is accomplished by absorption by baryta water and titration with $\frac{N}{10}$ hydrochloric acid, phenol-phthalein being used as an indicator. Only a small quantity of baryta water is employed in each experiment (under 15 C. c.) and after absorption this is titrated in the tube in which the absorption has taken place. The burettes are in air-tight connection with the receivers, and special arrangements are employed for filling and emptying them, and also for stirring. The whole of this apparatus is in duplicate, so that strictly comparative experiments can be carried out.

By means of this apparatus Blackman has made very numerous experiments on various leaves, thick and thin, and with stomata on one surface only, or on both surfaces, and has found in all cases that in the process of respiration the gas is exhaled through the stomata. When the upper surface of a leaf is free from stomata, practically no carbon dioxide is exhaled from that surface, while a considerable quantity is given off from the lower surface. When stomata occur on both sides of a leaf the amount of carbon dioxide exhaled from each is found to follow closely the ratio of the number of stomata. Similarly, in the process of assimilation, experiments have proved beyond question that no carbon dioxide is absorbed by a surface free from stomata; and that when the stomata occur on both surfaces the amounts absorbed vary directly as the number of the stomata each bears. That the stomata are the only path of entry of carbon dioxide for assimilation was also proved by the following simple experiment: A part of the lower surface of a leaf, the upper surface of which bore no stomata, was coated with wax so as to mechanically close the stomata, and it was found that in that area no starch could be formed, while the neighbouring portion became rich in starch.

The only other communication I have to make is on the phenomenon of polyembryony, or the development of two or more embryos in a single seed. This has been the subject of several investigations, and it has been shown that it may be due to several causes. Before proceeding to discuss these, I will venture to remind you very briefly of the structure of the ovule and the development of the embryo-sac.

The ovule consists of two integuments enclosing a

cellular mass, the nucellus. Within the nucellus the archesporium is developed, and after a while frequently absorbs the whole of it, with the formation of the embryo-sac or macrospore. The embryo-sac contains a single large nucleus attached to the walls by threads of protoplasm. This nucleus divides into two, which separate one to each end; one of these gives rise to generative and the other to vegetative structures. Each nucleus divides into two, and each of these again into two, so that at each end four nuclei are produced. One nucleus from each end (the polar nuclei) now moves towards the middle of the embryo-sac, where they fuse together, forming the definitive nucleus (which after the oosphere has been fertilised divides repeatedly to produce the endosperm). The three nuclei which are left at one end are termed the egg-apparatus, the three at the other end are termed the antipodal cells; these latter become clothed with cell-walls, the former do not. In the egg-apparatus the other half of the pair which remains after the departure of the polar nucleus is the oosphere, the other pair being termed the synergids. The embryo-sac at this stage is the gametophyte generation of the flowering plant.

We are now in a position to discuss the causes of polyembryony. It has been shown that it may be accounted for by the fusion of two ovules, or by the formation of several embryo-sacs in one ovule. Further, Strasburger has found that it may be caused by the ingrowth of some cells of the nucellus into the embryo-sac, which there develops into adventitious embryos; while in other cases he discovered it to be due to the production of two oospheres in the embryo-sac, which on fertilisation, give rise to two embryos. Quite recently, a Russian botanist, Tretjakow, has described yet another cause of polyembryony.* In *Allium odorum*, in addition to the normal embryo formed from the oosphere by fertilisation, not unfrequently the antipodal cells also develop into embryos. Sometimes only one of these develops, but in other cases all three start into growth and give rise to embryos. These antipodal embryos commence their development immediately after the fertilisation of the oosphere, and the cell-divisions, at least in the earlier stages, correspond exactly with those in the embryo formed from that cell.

Tretjakow traces an analogy between these antipodal embryos and certain structures which are borne by the prothallia of certain ferns. In some cases (e.g., *Pteris cretica*) the sporophyte is developed from the gametophyte without the intervention of an oospore, but arises vegetatively upon the prothallium by direct budding. This vegetative production of the sporophyte by the gametophyte is termed apogamy. Now in the case of the flowering plant we have seen that the embryo-sac corresponds to the prothallium of the fern, and also that the antipodal cells are vegetative portions of it. Tretjakow, accepting the view that the antipodal cells are homologous to the vegetative cells of the prothallia of ferns, compares these antipodal embryos with those arising by apogamy in fern prothallia.

* 'Ber. d. Deutsch. Bot. Gesell.,' February, 1895.

Correspondence.

[Letters to the Editor should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.]

THE REVISION OF THE PHARMACOPEIA.

Sir,—This subject is exercising the minds of many at the present moment, and perhaps from the circumstances of the situation there prevails a state of mind not wholly conducive to its satisfactory settlement. The question, Whom does the revision most concern, the doctor or the pharmacist? is absorbing too much attention, and the person whom ultimately it concerns most of all is in peril of being overlooked, viz., the patient. It will be worth while to try the case from the point of view of the last-named.

To the question What is the Pharmacopœia? there is a simple answer, viz., a list of officially approved medicines. The test by which this list has been approved is usefulness to treat disease, and accordingly it is obvious that those who have the immediate treatment of disease in their hands, and upon whom the responsibility for results falls, must determine what the list shall be. The revision, therefore, of the Pharmacopœia must be primarily in the hands of the physician, and it is he who must say this preparation gives good or bad results, must be retained, rejected, or modified. Let it be noted that the standard by which each drug is tried is compatibility or incompatibility with the organism, and let the mistake be avoided of making the test-tube the arbiter upon this point. We shall do well to recall Dr. William Hunter's protest of many years ago that the stomach is "a stomach, gentlemen, a stomach," not a stew-pan, a fermenting vat, or churn (see Paris' 'Pharmacologia'). The Pharmacopœia is not the growth of a day, it has been built up slowly as the result of trials innumerable upon the sick body, and chemistry will not in reason ask us to discard this or that remedy which has stood the aforesaid test because the test-tube reports adversely. To Griffith's mixture the stomach says "yes," the mixture is acceptable, and we know that the iron thus administered is beneficial. It may not be very scientific to take milk, for we know that the gastric juice is not compatible with it—somehow we thrive upon it. It will not be needful to elaborate this part of the argument and insist that the apparatus in the pharmacist's laboratory does not give us an equivalent for the powers of the living tissues.

To parody this statement and contend that chemistry is of no use on such showing and a knowledge of chemical incompatibilities beside the mark would be to err as extravagantly in an opposite direction. No one *a priori* is justified in administering chemical incompatibles in mixture, pill, or other form, and if such preparation be advanced it must be on the grounds of the good effect produced upon the body. A knowledge of chemical incompatibles is of the utmost value to physicians, and upon such knowledge reliance is placed in the treatment of many poisonings. In the examination of a new drug we should first go to the chemist and learn of him what the laboratory has to say, and to wilfully shut one's eyes to the characteristics there manifested would be to act the part of a fool. Again, upon the suggestions of the chemist we ought to criticise anew the old and tried preparations, for modifications of these may give us yet better results. *Ceteris paribus* the palatability of a drug is not unimportant to the patient. The keeping powers of a preparation are yet more important, and there is a vast field which, it must be obvious to every sensible

man, belongs to the chemist and pharmacist, and which will yield only to his knowledge of how to cultivate. Surely there is room for the co-operation of both workers in the larger domain of therapeutics.

The revision of the Pharmacopœia belongs then to both, but here comes the rub, why is our friend found in such predominance on the shelves of the pharmacist? What makes him so attractive to the last named and to us so dull? Why do we give such preference to his 'Companion'? Somehow the partnership fails or is very unequally carried out.

Why should not the Pharmacopœia, which concerns the doctors so much, be to them as practical a guide as it is to pharmacists? If the facts which to us would be useful are to them so elementary, as some maintain, they need not look at them; by a little skilful management of the eyes these addenda could be made to fall on the blind spot. Dr. Lauder Brunton's paper has set forth a number of desiderata from the medical point of view which call for careful consideration, e.g., precautions as to the keeping of medicines; incompatibilities; simple directions as to prescribing, as, for instance, the best pill basis for permanganate of potassium; tables of solubilities, etc., etc.

My own feeling as to the Pharmacopœia is that it should be altered as little as possible, and that any and everybody engaged in its revision should be a treble-dyed conservative with an extra dose of inertia; that the expunging from and admission to this inner circle of tried medicaments should be equally hard; that revisions should not be too frequent, in order that we may avoid that fluctuation which must mark current medicine. The Pharmacopœia should not reflect the medicine of the hour, it should live in a calmer atmosphere. But notwithstanding these sentiments I feel that the British Pharmacopœia is not to us doctors the guide it should be, and I cannot see why on the lines indicated by Dr. Brunton and above enumerated changes might not with advantage be introduced. It would not be untried or new knowledge which would thus be incorporated but facts of practical and every-day application. It would further be of great value to have some indication as to a dosage *pro die* as well as *pro dosi*, and to introduce the continental plan of the marking thus (!) by the prescriber any dose on a prescription which should stray outside the limits of pharmacopœial sanction. To both of these points Dr. Brunton makes reference. Might I add another innovation which would, I think, be useful; it would be to put in brackets after each test for impurities the name of the impurity thus to be detected? This would not add appreciably to the bulk of the letterpress, it would make more readable and more capable of retention this part of the description of the drug, and for reference in case of unusual effects, which an impurity might explain, it would be of practical use. To the doctors' faults or ignorance in this respect the pharmacist might again be "a little blind."

There remains to be considered a very important innovation which has been suggested, it is the introduction of some indication of the mode of action of medicines. Dr. Brunton would like this, but thinks we can hardly expect it. On this subject I feel very strongly that no such introduction should take place, but that it should be uncompromisingly opposed. It would at once introduce theory with endless and conflicting talk, the bulk of the book would be increased, and the simple character of the Pharmacopœia would be lost. This belongs to the science or art of medicine, and it belongs to treatises upon the same.

The Pharmacopœia presents us with the means of treating disease in the most approved forms; with the means of preparing and recognising these forms and

of detecting any impurities likely to occur; with the dose limits which include efficacy with safety. It might, we think, enlarge the scope of its utility by giving us information as to how best to keep our medicines, how to avoid the more important pitfalls of chemical incompatibilities, which would include simple directions as to the mode of prescribing or conveying insoluble, unstable, or otherwise intractable remedies; by the introduction of tables of solubilities; by further directions upon dosage, etc., but beyond such simple additions we think the revision ought not to proceed. *Satis quod sufficit.*

HARRINGTON SAINSBURY, M.D., F.R.C.P.

KJELDAHL'S PROCESS FOR THE DETERMINATION OF NITROGEN.

Sir,—Kindly allow me to add a word or two to your report of my paper on this subject read at the last meeting of the Chemical Society, by pointing out that, using the Jodlbauer modification of the process, the phenol or salicylic acid is dissolved in the sulphuric acid used for oxidation, and that after the zinc reduction (in the cold) which forms part of this process, the process is completed exactly as in the Kjeldahl-Gunning process correctly described in your preceding paragraph.

The Kjeldahl-Gunning process (sulphuric acid, mercury, and sulphate of potash) gave in my hands correct results with uric acid, asparagine, caffeine, indigotine, morphine, quinine, strychnine, and aniline, while the Jodlbauer or salicylic acid modification was satisfactory with nitrates, nitrobenzene, nitronaphthalene, nitraniline, dinitrobenzene, trinitrophenol, and potassium para-bromo-chlor-nitrophenol.

It might have been expected that reduction with zinc alone, without the use of salicylic acid, would suffice in the case of aromatic nitro compounds, but I find that if zinc alone be used with such compounds there is loss of nitrogen, which is obviated by the use of salicylic acid, and the same thing appears to hold good with azo compounds; but your reporter misunderstood me when he included in his reference to these compounds aromatic compounds containing amidogen. These, as will have been seen from the bodies I have already enumerated, yield their nitrogen quite easily by the Kjeldahl-Gunning process, except where the amidogen happens to be a part of an azo derivative.

I would also say that the Kjeldahl-Gunning process gives correctly the percentage of nitrogen in potassium ferro-cyanide, and that it is in the case of potassium ferri-cyanide that the use of sodium thiosulphate and zinc was found necessary in order to get fairly accurate results.

The total error for "blank" estimation, I should like to add, should not amount to more than the equivalent of 0.3 C.c. to 0.4 C.c. of decinormal soda solution, say from 0.0003 gramme to 0.0005 gramme of nitrogen. I should also like to say that, in the distilling apparatus which I use, the block tin tube does not dip directly into the standard acid, as might perhaps be inferred from your report (although such is not actually stated to be the case), but that it is connected with a pear-shaped glass bulb, which serves to conduct the ammonia charged steam into the standard acid, and at the same time, by the expanded space it affords, to prevent regurgitation.

In troubling you with these addenda to your report, I only seek to save possible trouble to any reader who from reading it may be led, without previous experience, to try the process, the successful working of which depends mainly upon the observance of what might appear to be minor details.

BERNARD DYER, D.Sc., F.I.C.

17, Great Tower Street, E.C.

ELEMENTARY PHARMACEUTICAL EDUCATION.

Sir,—As I was unable to raise the matter at the Annual Meeting, which I had fully intended to do, perhaps you will kindly allow me a little space in which to supplement my letter on the Preliminary examination. It is now more than six years ago since, at an annual meeting, I drew attention to the anomalous state of the Preliminary examination. I had expected that I would meet with a good deal of opposition, but, so far from that, the members present seemed unanimously in my favour, and several past and present members of the Council personally sympathised with me. That was more than six years ago, and since that time there has been a steady flow of memorials and resolutions to the same effect directed to the Council, and yet that body remains entirely passive. Surely it is high time that adequate reason for this attitude were forthcoming. There is little doubt that a majority of the members and associates of the Society, if not of the whole body of pharmacists, advocate reform, and the power to act has been always in the hands of the Council. I see that the President, in his comments on the annual report, remarked that the failures would be lessened when candidates had learnt the necessity of spending sufficient time and money in preparation for the examinations. I do not believe that any increased outlay in those directions will lessen the number of failures.

The ground for this belief is the fact that a very large proportion of the rejected candidates have spent several years, in the aggregate, at pharmaceutical schools, but they seem really incapable, owing to want of early training, of grasping the necessary information. To subject these men to proper preliminary training would either develop them sufficiently to enable them to pass, or would keep them out of pharmacy altogether; either consummation most devoutly to be wished. Moreover, in the Society's school, the bulk of students, I believe, spend what is usually considered an adequate amount of time and money in preparation for the examinations, yet the percentage of failures from that institution is fully equal to that from anywhere else. I am not advocating increased primary education in order to benefit a favoured few, but for the material benefit of the ordinary pharmacist. Every sensible man admits, and it has now been laid down more forcibly than from the presidential chair, that the only chance of existence for the individual pharmacist in his competition with stores and amalgamated cutters, is his personal superiority, and the confidence in his skill and knowledge he can impress upon his circle of customers and how this end is to be attained by men with the educational acquirements of a respectable workman. It is difficult to see. Besides this, if the subjects of the qualifying examinations are to be learnt at all, it is surely the duty of the controlling body to see that they are learnt thoroughly, and I am sure this is impossible with the basis of knowledge represented by the Preliminary examination. It seems to me that a great responsibility rests upon the members of the Council in this matter, and I would again urge them to consider it, for upon reform depends the future welfare of pharmacy. Let us not be misled by that foolish and mischievous cry of utility. The real function of primary education is not utility but development, although I do not think the most rabid utilitarian going, if he understands the matter, can say that the subjects I propose to add are useless. As to the remarks of C. A. T., quoted in your last issue of May 25, life is really too short to waste time in discussing education with a man who regards algebra, geometry, and modern languages as "useless in the extreme." Nor do the biological facts adduced by C. A. T. assist his arguments.

128, Victoria Street, S.W. A. CAMPBELL STARK.

Notes and News.

CHEMISTRY AT THE STORES.—Not two miles from Charing Cross a well-known photographer lately entered the chemist's shop attached to a big store and asked for an ounce of mercuric chloride, and was somewhat surprised that no questions were asked and that the assistant made no demur to serving him. But the explanation was not long wanting, for the assistant quietly weighed out an ounce of calomel and began to wrap it up, but the photographer, who was also a dabbler in chemistry, politely remarked, "Have you not made a mistake; I asked for mercuric chloride?" "Oh, no!" was the reply, "this is the chloride, we generally call it calomel." "Ah, well," said the photographer, "if you look it up you will probably find in 'Atfield' that calomel is mercurous chloride, and that the mercuric salt is corrosive sublimate." The result was that he did not get his chloride.

PYROGALLIC ACID AS A POISON.—At an inquest held at Ryde, I.W., last week, it was shown that the deceased, a child about two years old, had somehow got possession of a bottle containing a solution of pyrogallie acid for photographic purposes. The *post-mortem* examination clearly proved that the acid was the cause of death, but the medical man in attendance has surely been incorrectly reported in the local newspaper, which represents him as stating that "a grain and a half of pyrogallie acid was sufficient to cause the death of a man."

THE USE OF GAS CYLINDERS.—The Secretary of State for the Home Department has requested the following gentlemen to inquire into and report on the manufacture, filling, and use of gas cylinders—viz., Professor C. V. Boys, Professor H. B. Dixon, Dr. A. Dupré, the Rev. F. J. Smith, and Professor W. C. Unwin. Mr. Robert F. Reynard, of the Home Office, will act as secretary to the Committee.

PHOTOGRAPHIC EXHIBITION.—The prospectus of the fortieth Annual Exhibition of the Royal Photographic Society has been issued. The judges this year are: In the art section, W. L. Colls, Colonel J. Gale, F. Hollyer, B. G. Wilkinson, and W. L. Wyllie, A.R.A.; in the technical section, Captain Abney, Chapman Jones, F.I.C., F.C.S., and Andrew Pringle, F.R.M.S. The exhibition will be inaugurated on Saturday, September 28, by a private view, followed in the evening by a *conversazione*, and will remain open until November 14. The Council has this year decided to issue an illustrated catalogue in the place of the usual one, reproducing in it a selection of the pictures best calculated to convey an idea of its appearance, otherwise there is no important alteration in the lines upon which it will be conducted. The exhibition will, as usual, be held at 5A, Pall Mall East, and particulars can be obtained from the Secretary at the Society's new offices at 12, Hanover Square, W.

NEW CHEMICAL SOCIETY AT MILAN.—It is reported that a new institution has lately been formed in Milan for the encouragement of the study of chemistry and the furtherance of chemical industry in all its branches, under the style of the Società Chimica Milano.

FLÜCKIGER MEDALS.—At the last meeting of the Flückiger Fund Committee at Constance, it was decided, says the *Apotheker Zeitung*, that in future only gold medals should be struck, and that they should be awarded every five years from 1897 onwards. The award will be made by the Committee, and the medal will be delivered to the recipient by the German or Swiss Apotheker Verein alternately, at their annual meetings. The interest accruing from the Fund is to be devoted either to a travelling stipendium, a prize, or a grant for scientific work, but only in large sums at considerable intervals. As the Fund amounts to only 10,000 francs, an increase by donations is much wanted. The Committee will meet henceforth every two years at the meeting of the German or Swiss Apotheker Verein alternately.

ANTI-CANCER SERUM.—Emmerich and Scholl claim to have prepared an anti-cancer serum from sheep's blood. The observation frequently made that the appearance of erysipelas was followed by disappearance of cancerous growths led to the discovery of the serum, which is to be supplied soon by Dr. Scholl, Thalkirchen.

BACTERIOLOGY OF CLOTHES.—Dr. Leltz, of Munich, says the *British Medical Journal*, has found as many as 956 thriving colonies of bacteria on a worsted stocking that had been worn, and 712 on a cotton sock. A glove accommodated about thirty-three colonies, and a piece of woollen stuff twenty. The micro-organisms found were mostly non-pathogenic forms, the others being staphylococci. The typhoid bacillus was found in one case, however, on clothing that had been worn between three and four weeks, the *staphylococcus pyogenes albus* occurred in clothes that had been worn nineteen days, and the anthrax bacillus found in clothes was still virulent after a year.

"GODFREY'S CORDIAL" FOR INFANTS.—According to the local report of an inquest held at Shrewsbury on May 31, a chemist and druggist of that town was asked to treat a child, nine days old, whom, however, he did not see. He supplied some "Godfrey's Cordial," the bottle being properly labelled, but the mother appears to have neglected the printed directions, and the result was that the child died from the effects of an overdose of opium. The coroner expressed the opinion that a great mistake was made in giving opium cordials to children, but thought there was no reflection against the chemist. He also remarked that he hoped he would in future not dispense (? prescribe) for children without seeing them. It would have been better, perhaps, if the coroner had said that it would be wiser for the chemist to refrain entirely in future from prescribing for children.

BACTERIOLOGICAL INSTITUTE IN DUBLIN.—The Boards of Guardians of a large number of Irish unions having adopted a resolution inviting the Irish Local Government Board to take the necessary steps to establish a Pasteur Institute in Dublin, the Local Government Board is now collecting information as to the amount of public money expended in sending poor patients to the Paris institute, and it is anticipated that there is considerable likelihood of the suggested institute becoming an accomplished fact.

PEPYS' DIARY AS A MEDICAL GUIDE.—Dr. D'Arcy Power, in an address to the Abernethian Society, has taken advantage of the fact that Pepys, in his classical work, has dissected himself so completely, and carries the process further, laying bare the famous old timeserver's psychical weaknesses as thoroughly as he has himself exhibited to the world his many physical infirmities. Pepys had inherited a tendency to stone in the bladder, and discourses at length upon his varied symptoms, the result being that certain extracts from his 'Diary' are so blunt and outspoken as to be considered by the *Lancet* unfit for publication even in the pages of a medical journal.

INCIDENTS IN A CHEMIST'S LIFE.—Under the title of 'Struggles and Incidents in the Life of a Chemist,' Mr. Robert White, pharmaceutical chemist, of East Finchley, has published a small volume embodying a brief autobiographical notice and a number of interesting and amusing reminiscences of life in the United States, California being the scene of many of his earlier adventures. The little book should prove of considerable interest to Mr. White's friends, whether pill-rollers or not, and it may easily serve to while away pleasantly a leisure hour.

MARIGNAC MEMORIAL LECTURE.—The June number of the *Journal of the Chemical Society* contains a lecture by Professor P. J. Cleve, on the life-work of Jean Charles Galissard de Marignac, a former Foreign Fellow of the Society, who died on April 15, 1894. The chief amongst Marignac's researches were probably those on the rare earths, but he also did important work on the chemistry of minerals, and in physical and analytical chemistry. The lecture, as published, is illustrated by a fine half-tone print, and Professor Cleve concludes his account in the following terms: Modest, patient, and unassuming, transparent in character and honest of purpose, with no other conception of his calling than that of pursuing truth for truth's sake, Marignac lived wholly for science, and no man has served her with a purer or more unselfish devotion. If the world of science is the poorer by his loss, it is the richer by his example.

MONUMENT TO LAVOISIER.—The Tsar, according to the *Novoe Vremya*, has approved of the opening of a subscription throughout Russia for the erection of a monument to the great French chemist, Lavoisier.

English News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

ROYAL BOTANIC SOCIETY.—Professor George Henslow delivered a lecture to the Fellows of the Royal Botanic Society and visitors at the Gardens, Regent's Park, last week, on "A Century of Progress in Floriculture." He showed specimens of the original wild plants from which some of the most admired garden flowers have arisen, and illustrated with numerous diagrams the various stages in the way of cultivation and hybridisation they have passed before reaching the perfection of to-day. While the changes from the, in many cases, insignificant wild flower had been little short of marvellous, there was a limit beyond which they could not go; and he was afraid that with some few of our florists' flowers, that limit had already been reached.

PRESCRIBING BY A CHEMIST.—An inquiry was held at Southampton, on May 28, relative to the death of Lester James Dumper, aged three years, lately residing with his parents in Andrew's Terrace. —Emily Dumper, mother of the deceased, said her husband was employed as cook at one of the hotels in Port Elizabeth, South Africa. Her child was taken ill with a cold on Sunday last, and she gave him medicine procured from a chemist in East Street, who prescribed the medicine for the child. Between three and four on the Monday morning deceased became worse, and Dr. Fere Russell was sent for. He attended, but the child never recovered, and it died about eight o'clock. —Mr. Forbes Russell stated that he was in attendance on the child early on the Monday morning. It was then in a state of collapse; in fact, it was dying. The child was examined with the stethoscope. He found acute congestion and croup. He asked the mother why a medical practitioner had not been called sooner, and she replied that she did not think it was so bad. The cause of death was due to congestion of the lungs. A verdict of death from natural causes was returned. —The coroner advised the mother in future when she had a child ill to call medical aid at once, and not to rely on a chemist.

PHARMACEUTICAL STUDENTS AT MORPETH.—On Thursday, May 30, a party of over twenty students from the North of England School of Pharmacy, Newcastle, accompanied by Mr. G. F. Merson, principal of the school, made a botanical excursion to Morpeth. On arrival the party was met by Mr. F. F. Schofield, ex-Mayor of Morpeth and local secretary of the Pharmaceutical Society, who had kindly made arrangements for the students to visit several places of interest in the neighbourhood. In the forenoon the Chapel Woods were explored; then, after lunch in turn, were visited Newminster Abbey Ruins, Bedford Castle (where the group was photographed by Mr. John Gibson of Hexham), Mitford Hall, and the greenhouses at Spital Hill. Lastly, after a substantial tea, provided by the host of the Earl Grey, had been partaken of, Mr. Edward Hopper's unique collection of orchids was visited, the party returning to Newcastle after a splendid day's outing at 9 p.m.

PEACH-KERNEL OIL has an odour of bitter almond and benzaldehyde may be extracted from it by shaking with a solution of sodium bisulphite (see *J. Ph. v. Elec-Lothr.*)

Scotch News.

IMMUNITY AGAINST COBRA VENOM.—At the twelfth ordinary meeting of the Royal Society, Edinburgh, for the present session on Monday, June 3, the Hon. Lord M'Laren, Vice-President, took the chair, and a communication was read on the Rendering of Animals Immune against the Venom of the Cobra and Other Serpents, and on the Antidotal Properties of the Blood-Serum of the Immunised Animals, by Prof. Thomas R. Fraser, F.R.S. The author submitted a highly important paper, giving the results of a series of experiments, in which it was found that by the long-continued and gradual increase of the dose such animals as rabbits could be rendered immune to such enormous doses as fifty times the minimum lethal dose. The animals not only showed no symptoms of poisoning, but had actually considerably increased in weight. It was also shown that the serum of immunised animals possessed the power of protecting non-immunised animals against at least as much as four times the minimum lethal dose. This was found to be the case in a series of experiments in which the serum was hypodermically injected thirty minutes after the venom, and when poisonous symptoms had shown themselves. So small a quantity as 1/250th part of a cubic centimetre of serum was an effectual antidote against the minimum lethal dose per kilogramme of body weight. At present a horse is under treatment with a view to obtaining a large supply of antitoxin serum for a more extended series of experiments. The author found that the best form in which to have the serum for use was to evaporate it *in vacuo* over sulphuric acid and reduce it to powder. In this form it retained its properties apparently for an indefinite period, and the serum could be readily produced by the simple addition of water. To this powder the author applies the name "Antivenene," and when a sufficient quantity is obtained he proposes to examine it chemically, with a view to separating the active principle or principles. It was found that an animal immunised against one serpent venom was also protected against other serpent venoms. In one case protection was found to have lasted for a period of twenty days.

In the course of the paper it was mentioned that the author had found serpent venom, of which he used chiefly that of the cobra, much more deadly than even aconitine, strophanthin, or akocantherin, the latter being the most deadly poison of any he had hitherto experimented with.

Irish News.

IRISH MEDICAL ASSOCIATION.—At the meeting of the Irish Medical Association, held in the College of Surgeons, Dublin, on Monday, the 3rd instant, the President, Sir William Stokes, in the chair, a report was submitted from the Council of the Society which referred, amongst other matters, to the subject of the condition of Irish workhouse infirmaries.

Dr. Ninian Falkiner moved a resolution to the effect that the condition of those infirmaries—according to a report which had been submitted to the Council by Dr. Moorhead, of Coolehill—called for earnest attention and speedy reform.

Dr. Moorhead seconded the resolution, and remarked that the position of the Irish workhouse medical officer was peculiar. He had neither authority nor responsibility in his own hospital. No doubt he assumed authority at times, but if he did it was *ultra vires*, and he was liable to be pulled up for it at any time. He was bound to report to the

guardians defects of diet, drainage, ventilation, overcrowding, etc.; but when he did so he was generally abused in a scurrilous manner. If he wanted peace and quietness his best course was to go round at twelve o'clock, make up a few bottles of medicine, make no reports, and ask for nothing; and if he did not attend to the sick it did not very much matter.

Dr. Falkiner said that in England a short time ago a Commission was appointed to inquire into the condition of the Poor Law infirmaries of that country, and very few of them had been found fit to stand the light.

The President said it should be remembered that the defects in question did not exist in all the Irish workhouse infirmaries.

Dr. Falkiner's resolution was amended so as to refer to "many" Irish workhouse infirmaries, and was passed *nem. con.* The concluding part of the resolution requested the Council of the Society to call the attention of the Irish Local Government Board to the subject.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[From the *Illustrated Official Journal (Patents).*]

No. 9438.—Improved printing silver nitrate paper for photographic purposes and process of preparing same. May 13.

No. 9446.—Improvements in accouchement sheets, babies' napkins, hospital pads, and other like articles for absorbing discharges. May 13.

No. 9503.—Improvements in refining and separating wool-fat in sundry constituent parts. May 14.

No. 9626.—Improvements in air-tight receptacles suitable for holding sterilised surgical dressings and other goods. May 15.

No. 9639.—Improved means of preserving milk and other liquids and semi-liquids principally for food products in a liquid or semi-liquid form. May 15.

No. 9643.—Improvements in and relating to aseptic tables and the like for surgical use. May 15.

No. 9672.—Improvements in disinfectants. May 16.

No. 9691.—An improved means for bottling carbonated liquids. May 16.

No. 9706.—Improvements in or connected with chloroform and other anæsthetic inhalers or muzzles for animals. May 16.

No. 9715.—Improved vessel for delivering liquid in drops and case therefor. May 16.

No. 9765.—A new or improved disinfecting apparatus. May 17.

No. 9789.—An improved instrument or apparatus for extracting corks, parts of corks, shot, and the like from the interior of bottles, jars, and like vessels. May 17.

No. 9829.—Improvements in apparatus for softening water. May 18.

PATENTS PUBLISHED MAY 18.

Reducing metals from oxides or sulphides (Vautin, C. T. J.).—The inventor finds that the great affinity of aluminium for oxygen or sulphur at high temperatures may be utilised for reducing chromium, iron, tungsten, titanium, molybdenum, nickel, cobalt, uranium, vanadium, "glucium," and other metals from their oxides or sulphides. The compound is mixed with powdered aluminium in the finest possible state of division, and the fusion is conducted in a vessel lined with fire-clay, magnesite, etc. Fluor-spar, cryolite, or other flux may be added. The metal obtained is practically pure, and the heat produced by the reaction

is sufficient to fuse it, even in the case of chromium. No. 8306 of 1894.

[We understand this is the process which Prof. Roberts-Austin has been showing at the Royal Institution and elsewhere lately.]

Preserving milk, cream, etc. (Casse, W. F. E.).—The milk, etc., is contained in a metal vessel enclosed by a larger vessel, in which water is placed and then frozen. A non-conducting casing envelopes the outer vessel, and pins are affixed to the inner vessel to hold the ice and prevent it from breaking down as it melts. No. 11,393 of 1894.

Para-methoxy and para-ethoxy-phenyl-urea (Imray, O., communicated from the Farbwerke, formerly Meister Lucius und Brüning).—A solution of para-ethoxy-phenylurea in alcohol, is rendered alkaline with caustic potash solution, and ethyl iodide is added. After boiling, and distilling off the alcohol, the para-ethoxy-phenylurea may be crystallised out. The bromide or other salt of ethyl might be used. When preparing para-methoxy-phenylurea, the treatment is similar, but methyl iodide or other methyl salt is used instead of the ethyl compound. The caustic potash may be replaced by alkaline earths, ammonia, lead oxide, etc. No. 11,708 of 1894.

Treating sulphur waste (Albright, G. S. and Hood, J. J.).—The partly purified sulphur or sulphur waste obtained from gasworks, etc., is heated for some time in a closed vessel at a temperature slightly below the boiling point of sulphur. The volatile constituents such as ammonia, etc., pass off, and are collected, while such hydrocarbons, etc., as do not distil at the heat used, react upon the sulphur with evolution of sulphuretted hydrogen and deposition of carbon. After a period of about six hours the sulphur may be distilled off. No. 11,988 of 1894.

Filter (Breyer, F.).—Relates to a filter which frees the water from microbes, but removes none of its gaseous constituents. The filtering medium consists of a number of porous lenticular bodies covered with a textile fabric coated with an asbestos composition. This is produced by rubbing into the fabric a fine paste of asbestos fibres and then drawing through it a solution of sodium silicate. The inventor states that the filter removes all micro-organisms, and that it is readily cleansed by brushing. Another filtering compound for arresting micro-organisms is described. It is applied to the above-named surface, and consists of finely divided asbestos, kaolin and common salt or other salt. No. 5739 of 1895.

Filter (Davenport, J. J.).—Comprises a filter by which the water produced by melting ice is filtered from any impurity in the ice. The lower portion of the vessel is divided into two compartments by a slab of filtering stone or other material, and the ice placed in the vessel passes as it melts, through the slab into one of the compartments, from which it may be withdrawn by a tap. No. 5741 of 1895.

Washing compound (Coulter, F. E.).—Comprises a detergent composed of all or some of the following ingredients mixed together in stated proportions and in a special manner:—Paraffin, cera alba, oleum galtherium, oleum cassia, carbolic acid, and alcohol. The product is stated to be pearl-white and solid, and to remain hard at a summer heat. No. 5743 of 1895.

Filtering Milk, etc. (Rein, H., and Lübke, F.).—Refers mainly to the filtration of milk to remove hair, dirt, etc., for the preparation of children's food. The milk is poured upon a conical piece surrounded by a series of concentric sieves of increasing fineness, the outermost being the finest. The whole apparatus revolves at a speed of two or three hundred revolutions, so that the milk is driven through the sieves by centrifugal force, and is thus rapidly filtered. No. 6306 of 1895.

Poisoning Cases and Inquests.

Strychnine.—Louisa Hemingway, aged 37, died on Saturday, May 18, at 26, Cable Street, Lancaster, from the effects of strychnine contained in a rat poison, self-administered. Verdict: "Suicide while in an unsound state of mind."

Prussic Acid.—John Richard Bowden, aged 50, died on Monday, May 20, at Croydon Road, Penge, from the effects of prussic acid, self-administered. Verdict: "Suicide during temporary insanity."

Arsenic.—Albert Hodges, aged 2, died at Kewville from the effects of arsenic, contained in a sheep-dip mixture given by its mother in mistake for brimstone and treacle. At the adjourned inquest held on Monday, May 20, a verdict of "Death from misadventure" was returned.

Laudanum.—Jane West, aged 71, died on Friday, May 24, at 40, Hambro' Road, Streatham, from the effects of laudanum, self-administered. Verdict: "Suicide whilst mentally deranged."

Pyrogallic Acid.—At an inquest at Ryde, on May 29, on the body of a female child, aged two years and three months. Dr. Alfred Banks, F.R.C.S., deposed that the mother brought the child to him at nine o'clock on the Monday morning. It was then in a state of collapse. She also brought two bottles, one being labelled "Pyrogallic Acid," and the other "Sulphate of Soda." There were a few drops of fluid in the bottles. He prescribed for the child, telling the mother to give it a warm bath and stimulants, and saw the child again at three in the afternoon. It was then no better, being dangerously ill. It had symptoms of poisoning from the first, and after death he made a post-mortem examination which entirely confirmed his suspicion of pyrogallic acid. The kidneys were extremely congested, the lower part of the right being quite black. Every appearance denoted poisoning. There was no organic disease. The poisoning was undoubtedly the cause of death. This acid would not necessarily have taken effect before the Monday, as it took a good time to get into the blood. Two days were quite what one would expect. The contents of the bottles were such as were used in photography, but sulphate of soda was not poisonous. A grain and a half of pyrogallic acid was sufficient to cause the death of a man (!) Verdict: "Accidental death."

Carbolic Acid.—Samuel Lloyd, aged 48, died on Saturday, May 25, at Underwood Street, Chorlton-on-Medlock, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst insane."

Laudanum.—Elita Constance Jurgensen, aged 5, died on Saturday, May 25, at 35, Peterborough Road, Fulham, from the effects of laudanum, self-administered. Verdict: "Suicide whilst temporarily insane."

Aconite, Belladonna, and Chloroform.—Mrs. Haller, aged 62, died on Thursday, May 23, at Queen's Road Gosport, from the effects of aconite, belladonna, and chloroform contained in a liniment, self-administered. Verdict: "Suicide while in an unsound state of mind."

Rat Poison.—Annie Randall, aged 25, died on Friday, May 31, at Shenstone, near Lichfield, from the effects of a rat-poison, self-administered.

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

DRESSING FOR RUSSET LEATHER.

[878.] The *Druggists' Circular* gives the following formula:—Soft soap, 4 drachms; linseed oil, 6 drachms; butter colouring, 2 ounces; beeswax, 6 drachms; turpentine, 2 ounces; water, 2 ounces. Dissolve the soap in the water and add the butter colouring. Melt the wax in the oil and the turpentine, then gradually stir in the soap solution, and keep stirred until cold.

FUMIGATING PAPER AND POWDER.

[879.] The following aromatic solution (*Pharm. Cent.*) is useful for perfuming writing paper, blotting paper, or pine wood sawdust for fumigating purposes. Either of these materials are macerated in the following tincture and dried:—Crushed benzoin and tolu balsam, each 50 parts; styrax, 10 parts; are exhausted by 300 parts alcohol. Dissolve in the filtrate 10 parts Peru balsam, 1 part of oil of cinnamon, and 1 part of oil of lavender.

DISPENSING DIGITOXIN.

[880.] In administering digitoxin, which is very insoluble in water, care must be taken that the vehicle is so adjusted in alcoholic strength that re-precipitation does not take place in the stomach, or a cumulative physiological action from successive doses may result. According to Corin, this may be avoided by dispensing digitoxin as follows: Digitoxin, 2 to 3 milligrammes; chloroform, 6/10th cubic centimetre; alcohol, 90 per cent. by volume, 12 cubic centimetres; distilled water up to 150 grammes. One-third part to be taken for a dose (*Repert. de Pharm., after Scalpel.*)

IMPURITY OF ASAFCETIDA.

[881.] The amount of ash in a sample of asafœtida should always be determined before purchasing. The following results have been recently obtained:—

Powdered asafœtida "superior strained"	53.7	per cent. of each.
Powdered asafœtida in mass		
"superfine quality"	40.8	" "
Powdered asafœtida, strained	50.4	" "
" in tears...	2.08	" "

(*Pharm. Weekblad.*)

BISMUTH TRIBROMOPHENOL.

[882.] This substance, which has frequently been alluded to as an antiseptic, is, according to v. Heyden's patent, prepared as follows:—Thirty parts of tribromophenol are dissolved in a mixture of 150 parts of water and 4 parts of caustic soda, and 12 parts of bismuth nitrate added. The precipitate is freed from excess of tribromophenol by washing with spirit, the residual bismuth tribromophenol containing about 50 per cent. of bismuth oxide.

PRESERVATION OF WHOLE FRESH FRUITS.

[883.] Petit advocates the following method for preserving whole fruits, such as grapes, etc. (*Pharm. Zeit.*) He takes a large cask, inserts a false bottom made of laths, and covers this with rough wood shavings; on this he places the fruit, after having put underneath it a bowl containing pure alcohol. The cask is then securely closed. After three months the fruit is found to be still in perfectly sound condition. The author considers that the alcoholic vapour exercises this preserving influence.

New Remedies.

[The notes given under this heading, for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

PAPAIN FOR EXPULSION OF TAENIA.—Dr. Bartholow succeeded in expelling a parasite seven metres long in an obstinate case of *Tenia solium* which had resisted all other methods of treatment, by means of doses of six decigrammes of papain (about 10 grains) given three times daily after each principal meal. Papain exerts a toxic action on the parasite, so that it becomes detached from the mucous membrane of the intestine and is expelled by the peristaltic movements (*La Médic. Mod.*)

BAD EFFECTS OF CHLORALOSE.—Dr. Rendu cites a case in which an injection of 25 centigrammes of chloralose into a tuberculous patient was followed by alarming symptoms; in two hours the patient was comatose and apparently moribund, but recovered under injections of ether, followed by morphine. In an editorial, *La Médecine Moderne* recalls five or six similar cases published in that journal last year, following the use of 20 to 40 centigrammes of chloralose in cachets. Similar cases have also been brought before the Société de Thérapeutique. A Russian physician observed bad symptoms in two out of seventeen cases of insanity treated with the drug (*Univers. Méd. Journ.*, new ser., vol. iii., p. 101).

CINNAMON IN DYSENTERY.—Surgeon-Major Ave-tom has found the administration of a bolus of a drachm of powdered cinnamon bark taken morning and evening, washed down by a mouthful of water, very successful in thirty cases; observations were extended over a period of two years, ordinary cases were cured by one or two doses, the worst by six administrations (*Lancet*, March, 1895).

[These results would render the trial of cinnamon oil or cassia oil in suitable doses interesting; the therapeutic result would probably be the same, and would obviate the necessity of swallowing a large amount of inert "woody fibre."]

UNFAVOURABLE COMMENT ON LOSOPHAN.—Dr. Abbot Cantrell, of Philadelphia, thus concludes an inquiry into the value of losophan in his dermatological practice. It proved entirely inefficacious in almost every disease of the skin. Tinea sycois was cured in one instance, but after two months' treatment. It gave a slight idea that it may be useful in acne. He concludes his note thus:—"I think it a waste of time for anyone to make use of it in treating diseases of the skin" (*Therapeut. Gaz.* [3], vol. xix., p. 221).

CANTHARIDES IN LEUCORRHEA.—Slocum has obtained good results with a combination of cantharides and ferric chloride thus:—Tincture of cantharides, U.S.P., 96 minims; tincture of ferric chloride, 160 minims; dilute phosphoric acid, 160 minims; syrup of lemon, 2 fluid ounces; water, to 4 fluid ounces. One teaspoonful in water after meals (*Phil. Polyclin.*, after *Therap. Gaz.* [3], xix., 276).

BORAX IN RHINITIS.—Museum employs a solution of borax in glycerin diluted with water, so that it can be sprayed, by means of a nasal atomiser, for various forms of rhinitis. The solution is made thus:—Glycerin, 7 parts; borax, 2 parts; distilled water, 8 parts (*Rev. Intern. de Méd. et de Chir.*, 1895, p. 159, after *Deutsch. Med. Woch.*)

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

* * * Queries should be addressed "Editor," and will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTERS.

PRESCRIBING BY CHEMISTS.

CORNUBIA says:—"Apparently Dr. Wynn Wescott is greatly disturbed by the doings of chemists. He reminds me very forcibly of the stage in Richmond Park at certain seasons, when they are trumpeting and pawing the ground in a most ludicrous manner. Don Quixote charging the windmill is not in it. Certainly the Medical Defence Association ought to give him a good refresher. Perhaps, in the near future the doctor will turn his attention to his own profession, who more frequently recommend 'patent' (proprietary) medicines than chemists, and with much less knowledge of their composition. I wish particularly to call his attention to that portion of the medical profession who dabble in law, acting as legal assessors to the panel of twelve men and true, thus usurping the position of solicitors without satisfying the Law Society of their competency and getting placed on the rolls. Such dabbling is very 'unorthodox.'"

SULPH. PRECIP. IN CONF. SULPHURIS.

Mr. O. W. CATFORD, of Crewkerne, writes as follows:—"In view of the numerous suggestions put forward for the projected revision of the Pharmacopœia, possibly a suggestion which I have made to some prescribers in my own locality, and has been favourably received and acted upon by them, may be deemed worthy of a place in your columns. I refer to the substitution of precipitated for sublimed sulphur in conf. sulphuris. It makes a preparation more elegant from the pharmaceutical point of view, pleasanter to take for the patient, and so far as I can learn from several prescribers who have adopted it on my suggestion, at least equally efficacious therapeutically. This confection in my experience is regaining favour after being comparatively neglected for some years, and if it can be made more palatable without impairing its efficacy, 'so much the better.'"

ANTI-EXTREME CUTTING.

Messrs. ELLIMAN, SONS AND CO. writes as follows:—"There are indications which suggest that we might now more successfully put forward a plea for co-operation, this being sometimes necessary to get at the indirect buyer who resorts to roundabout ways in order to obtain supplies. By co-operation such a person could be dealt with effectually, and if three or more manufacturers whose sales are large would co-operate with us for the purpose of tracking the supplies of the cutter of the preparations

of any one of us, we, the associated firms, could prove that anti-cutting terms of business can be made absolutely successful, when more would probably join in the movement. It would not be necessary for the associated firms to deviate from their anti-cutting terms now in force, nor disclose any detail of their business operations. Shortly, 1. When the preparations of any one of the associated firms were proved by evidence to be sold under the minimum prices the accounts of the wholesaler who had supplied the cutter would be closed by the associated firms, if the wholesaler could not prove that the cutter had agreed with him not to sell below agreement prices, and also not to pass the goods to another person without securing a similar agreement; 2. The indirect buyer who cuts would be dealt with in a manner to be agreed upon which need not be made public, but which by co-operation is certain of success. We have only three reported cases of cutting in hand at the moment, and these being cases of obtaining supplies directly, co-operation is desirable to settle them quickly. The sources of supply of a dealer obliged to obtain supplies by roundabout ways could be more easily traced by co-operation than the source of one article only can, and it would be a serious matter for any firm to have the supplies of several leading preparations stopped."

ANSWERS.

C. F. J.—It is probably the outer tunic or membrane scales of a *Crinum*.

A. BERTHELLOT.—Your appreciation should be welcome. By the way, what is the Society you name?

JOHN MITCHELL.—Your communications have been received.

W. E. MILLER.—The remainder of the evidence given had no direct bearing upon pharmacy proper, and is hardly worth finding space for in the Journal. I witness you refer to doubtless knew what he was talking about when he expressed the opinion that there is a considerable amount of direct adulteration in the grocery trade, but was on less safe ground when calling in question the capacity of medical men and pharmaceutical chemists, and his evidence may safely be ignored.

HAROLD COLEMAN.—Many thanks for your assistance.

CORRECTIONS.

Page 1107, column 2, line 66, for "250 grains" read "1250 grains."

Page 1110, column 1, line 49, for "Infusion" read "Infusoria."

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Bayley, Catford, Coleman, Dyer, H. H. Hick, Hill, Jones, Mitchell, Mumbray, Pals, Wheeler.

Publications Received.

[Publishers are requested to state the price of books in this column.]

KATECHISMUS DER STÖCHIOMETRIE. By A. and I. FRICKINGER. Sixth Edition. Pp. 284. Price 1 8.50 (paper), M. 4.55 (bound). (G. H. Beck'sche Verlagsbuchhandlung, München, 1895.) From the Publisher.

THE MITCHELL LIBRARY, GLASGOW. Twelfth General Report for 1892-4. Pp. 66. (The Mitchell Library Glasgow.) From the Library.

F. A. FLÜCKIGER. VON A. TSCHIRCH. Pp. 46, with portrait. (R. Gaertner, S.W. Schönlebergstrasse 11 Berlin.) From the Publisher.

STRUGGLES AND INCIDENTS IN THE LIFE OF A CHEMIST. By Robert White, Pharmaceutical Chemist. Pp. 31. (John Davis and Co., Ltd., London.) From the author.

PHYSICO-CHEMISTRY.

(Continued from page 891.)

METHOD OF INTERPOLATION.

In the previous description of the correction of a thermometer reference has more than once been made to the method of interpolation for extending the corrections to intermediate points; a short account of this method will now be given.

In using a thermometer the temperature to be measured may be anything within the range for which the instrument is graduated, and the mercury may consequently stand at any point. We require, therefore, to know what the correction to be applied at any point amounts to. It is obviously impossible, however, to ascertain directly the correction for every point; if we found the error at each several degree mark we might still have to read a temperature lying between two such marks, and so on; and similar remarks, of course, apply to any other instrument. The assumption is therefore made that the increase or decrease in the error between two neighbouring points takes place gradually and evenly, and that the alteration in the error at any intermediate point will be proportional to its distance from the point at which the error is known. For instance, if the correction at 5° is $0^{\circ}8$, and at 10° it is $1^{\circ}2$, it is assumed that at $7^{\circ}5$ it will be $1^{\circ}0$, at 9° it will be $1^{\circ}12$, and so on. Such an assumption is warranted by what we know of the slight changes in diameter in passing along a glass tube, and is fully justified by the correctness of the results obtained by its means. But the points of direct observation must not be too far from each other; if at 5° the correction is $0^{\circ}8$, and at 25° it is $1^{\circ}2$, we cannot therefore assume that at 15° it will be $1^{\circ}0$, for in the distance from 0° to 25° there may be more than one distinct change in the bore of the tube, and such changes may augment or neutralise each other. For a thermometer stem intervals of 5° , as in the example given, lead to sufficient accuracy for all ordinary purposes.

DATA ASCERTAINED DIRECTLY.

a. Corrections of Bore.

Reading.	Correction.	Reading.	Correction.
5°	+0.25	55°	-0.68
10°	.30	60°	.65
15°	.35	65°	.58
20°	.30	70°	.45
25°	.10	75°	.40
30°	-0.10	80°	.30
35°	.30	85°	.20
40°	.50	90°	.10
45°	.60	95°	0.00
50°	.63	100°	0.00

b. Corrections of Fixed Points.

0°	+0.30	100°	+0.10
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What has here been said of interpolation in the correction of thermometers applies not only to the correction of other instruments, but also to very many measurements that are not of the nature of corrections. For instance, 100 parts of water dissolve 53.5 parts of potassium bromide at 0° , 64.6 parts at 20° , 74.6 parts at 40° , 84.7 parts at 60° , etc. Here the solubility clearly increases almost exactly

in proportion to the rise in temperature, and we are justified in assuming that at 10° , 59 parts will be dissolved; at 30° , 69.6 parts; at 50° , 79.6 parts, and so on; and these assumptions are shown to be substantially correct by experiment.

GRAPHIC REPRESENTATION.

But it would be very troublesome to have to calculate each intermediate value in any such series by a sum in proportion, and the need for doing so is avoided by recourse to the graphic method of representing results. Two sets of parallel and equidistant lines are drawn, cutting each other at right angles, as in Figs. 1, 2 and 3.* The intervals between these lines are assigned definite values, distances from left to right representing one series of quantities, and distances from top to bottom the other series. This will be made more intelligible by the following examples:—

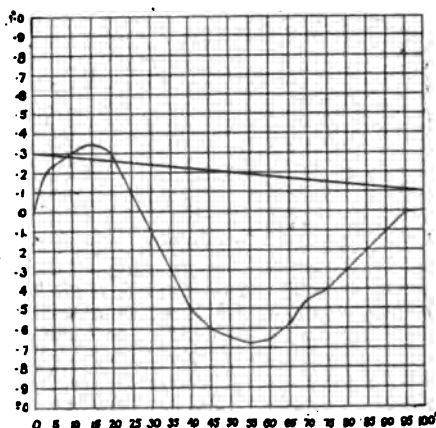


FIG. 1

In Fig. 1 the corrections for the bore of a thermometer stem are represented by the irregular line. The distance between any two of the transverse lines represents one-tenth of a degree, while that between any two of the vertical lines stands for 5° measured on the stem of the thermometer.

The corrections for the points 5° , 10° , 15° , etc., up to 100° having been found as described before, a mark is made on the vertical line representing 5° , where it is crossed by the line representing the numerical value (0.25) of the correction at this point, or in this case midway between the lines representing .2 and .3, and similarly the corrections for the other points are put in. When the correction has to be added to the scale-reading to give the right temperature, it is shown above the line marked 0° ; when it must be subtracted it is put below that line. If all these points are now joined by a continuous line this will show in the same way the corrections for intermediate points; for instance, when $7^{\circ}5$ is read on the scale we see that $0^{\circ}27$ must be added; if 38° be read, $0^{\circ}48$ must be subtracted, and so on.

So far, however, we have only dealt with the corrections for unevenness in the bore. To obtain the complete correction, the corrections at 0° and

* Paper ruled in this way can be obtained of any apparatus dealer.

100° are indicated on the same or a similar chart; if the points representing these are joined by a straight line the proportionate correction for any point is at once shown. To avoid the need of adding together two corrections for every point when using the chart this should be done once for all for points distant by 5°; by plotting in the same way the composite corrections so given, a curve like that of Fig. 2 is obtained, and

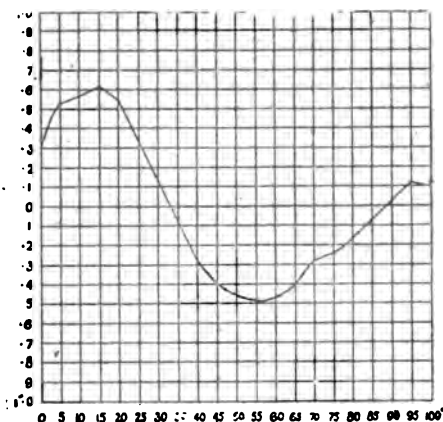


FIG. 2

this shows at a glance the necessary correction to be added or subtracted for every reading of the thermometer between 0° and 100°. The curve of corrections for the bore only is given in this example in order to make every step plain. But it is clearly not necessary that this curve should be drawn at all, as it is not needed in constructing the final curve.

In Fig. 3 the solubility of potassium bromide in water at different temperatures is represented, starting from the data given above. Vertical distances here stand for temperatures, and distances from left to right indicate the number of parts of the salt dis-

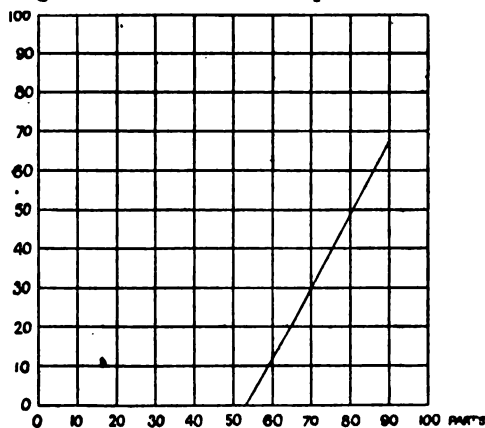


FIG. 3

solved by 100 parts of the solvent. On the line representing 0° a mark is made at the point corresponding to 53.5 parts; on the line representing 20° another mark is made at the point which indicates 64.6, and so on with the other data. On drawing a line so as to connect all such points it indicates at

once the solubility of the salt in question at any intermediate temperature. In all curves of this kind distances measured from left to right are called abscissae, and vertical distances are called ordinates, measuring in every case from the zero line.

There is another important application of curves of this kind. Any quantitative experiment, either physical or chemical, is always liable to give a slightly erroneous result; this is partly due to the limits of accuracy of the instruments used and to imperfect observation; but with the most perfect instruments and the greatest care there still remains in general a small residual error. As this is just as likely to be on one side of the truth as the other it is got rid of or reduced to negligible dimensions by making several determinations of the quantity in question, and taking the mean value of the results.

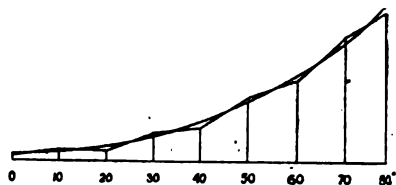


FIG. 4

But it is also possible to use one value to correct another, even when they are readings of different quantities. For instance, the values found by Regnault for the vapour pressure of water at different temperatures are represented graphically in Fig. 4, the abscissae showing the temperatures, and the ordinates the pressures, in any suitable units.

It is here clear that the pressure rises with the rise of temperature; but if the points are joined, the line so obtained is sinuous and irregular. It is not to be supposed that such irregularities actually occur just at the points that have been chosen for observation and at no others. On the contrary, there is the greatest probability, amounting practically to a certainty, that the increase is regular and should be represented by a regular curve. The sinuosities thus appear as due to the residual errors of observation, and since these errors will be as often on one side as the other, the most probable true curve will leave as many of the points on one side as the other, as shown in the figure. In the plotting of curves, then, the greatest correctness is not obtained by joining by straight lines the points that have been marked, but by drawing a continuous curve that shall pass through as many as possible and leave others as often on one side as the other. Such curves are drawn by means of flexible rulers; these are made in various ways, one of the most useful forms being a strip of fairly thin steel with a lead backing fastened to it. It not infrequently happens that a distinct break occurs in a curve which is not due to error, but represents an alteration in the law of change of the quantity in question. The different parts of the curve are then drawn separately with the flexible ruler, and meet at the "points of flexion" or breaks.

For the most perfect interpolation the algebraic equation representing the law of the curve or of the part of it in question is ascertained, and from this formula any of the intermediate values can be found exactly; but as this process requires some

knowledge of higher mathematics it will not be considered here.

SPECIFIC GRAVITY.

We can now leave the subject of the plotting of curves and pass on to the measurement of some other physico-chemical quantities. It will be convenient to deal next with specific gravity.

The specific gravity, or as it is more correctly but less frequently termed, the relative density, of a substance is the ratio borne by the weight of a certain volume of it to the weight of an equal volume of a standard substance under similar conditions; that is, the ratio of its density to the density of the standard substance. In the case of solids and liquids the standard substance always employed is water, and the most important condition is temperature; for gases either hydrogen or air is taken as a standard, and the pressure on the gas at the time of experiment is another important condition.

As has been just stated, for the determination of the true relative density of a substance, both it and the standard substance should be at the same temperature. It is, however, sometimes more convenient or useful to compare their densities at different temperatures. The temperatures employed should always be recorded, and are written thus:— $15^{\circ}/15^{\circ}$, $100^{\circ}/15^{\circ}$, etc., the temperature of the substance in question being put first, and that of the standard (water, air, or hydrogen) second. Thus, if the relative density of a substance is recorded thus, "s.g. $15^{\circ}/15^{\circ}=1.1435$," the meaning is that any given volume of the substance at 15° weighs 1.1435 times as much as an equal volume of water (if dealing with a solid or liquid), also at 15° ; "s.g. $100^{\circ}/15^{\circ}=1.142$ " indicates that a given volume of the substance at 100° weighs only .9142 times as much as an equal volume of water at 15° . Some lack of uniformity prevails as to the temperature at which specific gravities are determined. That most commonly employed is either 15° C. or 60° F. (15.5° C.), but determinations are also made at 4° C. (the temperature at which the density of water is greatest) and at 0° C. It is most convenient to employ the temperature 15.5° C.; this can always be readily obtained in the laboratory.

The specific gravity of liquids is usually determined by means of the specific gravity bottle; as, however, the method is generally described in textbooks, together with the common method of finding the specific gravity of solids by displacement of a liquid, it will not be necessary to discuss either here. But it frequently happens that it is required to determine the relative density of a liquid of which the quantity available is too small for the ordinary bottles, or of a solid which is only obtainable in powder or small crystals; recourse must then be had to other means.

The most useful vessel for finding the specific gravity of a liquid is the Sprengel tube. This consists of a glass tube constricted in the middle by drawing out, and bent into U shape, the ends being also narrowed, and bent nearly at right angles to the wider portion, as shown in Fig. 5.

This may be made of any size that is convenient; for the larger sizes it is best to grind small glass caps to fit the ends, while the smaller sizes may be closed when required by sealing the ends in the flame. A fine line is drawn on one arm (a), by scratching with a diamond or a file. The tube is

first weighed empty and dry, being hung on to the arm of the balance by a wire; pure water is next drawn into it so as to fill it from the extreme end of the one arm to the mark on the other; it is then allowed to stand in a bath of water at 15.5° until it is exactly at that temperature, any excess of its contents being removed by bringing a slip of filter paper to the end of the full arm until the liquid in the other stands just at the mark; or any deficiency being made up by inclining it till the liquid just reaches to the end of the plain arm, then bringing a drop of the liquid on a glass rod to this end, and inclining the tube in the other way until sufficient has been drawn in. For the sake of

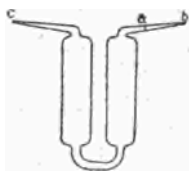


FIG. 5

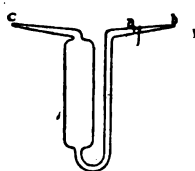


FIG. 6

accuracy it is best to always slightly overfill and draw a little out; the meniscus is then always turned the same way. After carefully drying and weighing, the water is emptied out and the tube dried again; the drying may be hastened by rinsing out first with alcohol and then with pure ether, slightly warming, and drawing air through. The liquid under examination is then put in, brought to 15.5° in a bath, and the whole again weighed. Deducting the weight of the empty tube from the two weights last found gives the weights of equal volumes of water and of the liquid in question.

With careful adjustment of the temperature, specific gravities correct to four decimal places may be found by the Sprengel tube with moderate quantities of liquid, while only a small error in the fourth place is involved, even when the quantity is very small. In filling the original form of Sprengel tube described here, it is necessary to invert the tube while sucking the liquid into the first limb, reversing its position in order to fill the second, to avoid leaving any air in. The necessity of the reversal is avoided in the form suggested by Ostwald, shown in fig. 6; this is filled in one position by dipping b into the liquid and sucking at c.

Where less accuracy is required, a convenient apparatus is a 1 C.c. pipette having very fine tubes. The liquid is brought to the proper temperature and then drawn into the tube up to the mark; the



FIG. 7

pipette is laid on a wire frame (Fig. 7) and weighed. The weight of the empty pipette and frame being known, the additional weight represents the specific gravity of the liquid.

To find the specific gravity of solid substances that are in small fragments a convenient and accurate way is to prepare a liquid of the same density and ascertain the latter as above. The test by which the densities of the solid and liquid are shown to be the same is that the solid should remain suspended in any part of the liquid. Suit-

able liquids are mixtures of water and saturated solution of barium mercuric iodide, by which any density from 1.0 up to 3.5 can be obtained, and of benzene and methylene iodide, having a range of from 0.9 to 3.3. Other liquids are suitable in special cases, and the one chosen must, of course, not act chemically upon the solid. The latter is powdered and introduced into a mixture whose density is judged to be about the same. According as the particles sink or float, more of the heavier or the lighter component is added until the particles remain indifferently in any part of the liquid; the relative density is then found by any of the methods for liquids.

Owing to the extreme delicacy of the method, it will not be easy to reach exactly the point described, but it is sufficient if only very slow movements of the particles take place. In general, the small fragments will not all show the same behaviour, and the heaviest will in all probability be the purest, if, at least, the substance is crystalline, since crystals are liable to enclose cavities or small quantities of mother liquor, either of which would make them too light, while there is no probable contamination that would make them too heavy.

(To be continued.)

GENERAL MEDICAL COUNCIL.

On Thursday, June 6, at a meeting of the General Medical Council, Sir Richard Quain, Bart., presiding, the following report of the Pharmacopœia Committee was presented:—

"The Pharmacopœia Committee has to report that applications for information bearing on the production of the new edition of the British Pharmacopœia have been sent to twenty medical authorities, and that from sixteen of these communications of great value have been received.

"The Therapeutic Committee of the British Medical Association has sent in a memorandum which furnishes important information as to the frequency with which a considerable number of official drugs and preparations are used by the members of that Association. The Pharmaceutical Society has supplied the Committee with an instructive report and statistics, and Mr. Martindale has forwarded a pamphlet in which the number of times certain drugs and preparations appear in twelve thousand prescriptions is stated. Information of value has likewise been received from other persons on various subjects. The Pharmacopœia Committee have, on behalf of the Council, thanked the various medical authorities and other bodies and persons who have sent in reports and communications bearing on the production of a new Pharmacopœia.

"In the last report of the Pharmacopœia Committee it was stated that, in reply to communications addressed by the Lord President of Her Majesty's Privy Council through the Colonial and Indian Offices to the medical and pharmaceutical authorities in the colonies and in India, asking for suggestions as to the revision of the British Pharmacopœia so as to adapt it to the requirements of these countries, many communications had been received.

"Professor Attfield has summarised these communications. He has likewise made for the use of the

Pharmacopœia Committee a summary of the suggestions of the various medical authorities. The Committee has, therefore, before it information from a very large number of sources, arranged in a very convenient form for reference.

"Dr. Tirard has been invited, and has consented, to act as Secretary to the Pharmacopœia Committee and to render assistance to the President in matters relating to the preparation of the new edition of the Pharmacopœia.

"The Pharmacopœia Committee deems it desirable to obtain the services of scientific Referees in Chemistry and Botany, to whom points of difficulty in connection with these sciences may be submitted, and, subject to the consent of the Council, proposes to invite Mr. Thiselton Dyer, C.M.G., F.R.S., and Mr. Holmes to act as Referees in Botany. It also proposes to ask Dr. Thorpe, F.R.S., to act as Referee in Chemistry, or Dr. Russell, F.R.S., if Dr. Thorpe be unable to accept the invitation of the Committee. The Pharmaceutical Society of Great Britain has, at the request of the Medical Council, appointed a Committee of Pharmacists to assist the Pharmacopœia Committee in the work of revision. A list of questions bearing on Pharmacy has been drawn up by the Pharmacopœia Committee for reference to the Council of the Pharmaceutical Society.

"The Pharmacopœia Committee likewise deems it desirable to obtain the services of recognised authorities in Pharmacology and Therapeutics, to whom points of difficulty in connection with the properties of particular drugs and preparations may be referred, and proposes that Dr. Lauder Brunton, Prof. Fraser, and Prof. Walter Smith be requested to act as Referees for this purpose.

"The Pharmacopœia Committee has already held three meetings during the present Session of the Council, and, in order to deal adequately with the materials before it and to consider the preparation of the first draft of the new Pharmacopœia, the Committee proposes to hold a meeting in London towards the end of July.

"Prof. Attfield has submitted his Ninth Annual Report on the Progress of Pharmacy during 1894, and the Committee directs that the same be printed, and that an Index to the whole series be prepared.

"RICHARD QUAIN, *Chairman*.

"June 5, 1895."

On the motion of the President the report was received and entered on the minutes:

Dr. HERON WATSON: May I ask a question with regard to this report? I see that communications have been received from the various bodies represented on this Council, that is to say, the British Medical Association, the Pharmaceutical Society, and the individuals who sent in reports and communications, and that they have been thanked for doing so. Have the papers which have been sent in been printed?

The PRESIDENT: Yes.

Dr. HERON WATSON: And may I ask if they have been presented to the Council?

The PRESIDENT: I think so. I think they ought to be sent to the Council and to the various bodies.

Dr. HERON WATSON: As far as the report makes mention of anything, there is no statement to that effect in the report.

The PRESIDENT: I think the documents are of a very satisfactory nature, and I think they ought to be sent to all the bodies, and to the members of the Council. The expense cannot be very considerable; they are in print, and I hope the Council will consent to that course.

Dr. HERON WATSON: I also wish to ask if there is to be any supplementary report of the Pharmacopœia Committee, because there is one point which was re-committed to it.

The PRESIDENT: We only aim at doing what is right and proper. If any further information is sent it certainly will be accepted.

Dr. HERON WATSON: It may be remembered that the Report of the Pharmacopœia Committee was re-committed on December 4, 1894, upon an amendment moved by Dr. Tuke and Sir William Turner, and that one of the subjects re-committed was a question in regard to the sum of £1250 assigned to Professor Attfield for his services as Editor. The Council agreed to £300 being paid at once, but we expected from the Pharmacopœia Committee a further report as to the question of £1250 being paid to the Editor. Is there any supplementary report from the Pharmacopœia Committee?

The PRESIDENT: In that case the Committee would report. On what date was that?

Dr. HERON WATSON: It was on December 4, 1894. You will remember a statement was made in connection with the supplementary report. The Committee merely sent in a memorandum stating generally that it was ready to fall in with the requirements of the Council in regard to the questions put forward.

The PRESIDENT: Nothing has been done in that respect with regard to Professor Attfield's appointment and salary. Since then he has been very hard at work, and we owe him thanks for his most admirable summary and condensation of these papers.

Dr. HERON WATSON: I should be the last person to doubt it. I am merely speaking to a matter of order. The matter of order is, that the question was re-committed, and we have no report on it from the Pharmacopœia Committee.

The PRESIDENT: I do not know that you re-committed the question of Dr. Attfield's salary.

Dr. HERON WATSON: That certainly is my impression.

Dr. LEECH: May I point out that it was alluded to, but not mentioned in the second report sent in by the Pharmacopœia Committee?

The PRESIDENT: It is not in the report; it was struck out before the report was adopted.

Dr. LEECH: It was alluded to, but not mentioned in the report.

Dr. HERON WATSON: The Report of the Pharmacopœia Committee, which was sent in on December 5, 1894, says that "the Committee has taken note of the opinions expressed in the Council on the question of

associating Professor Attfield, or one or more persons conversant with the subject other than the Pharmacopœia Committee. The question as to whether it is necessary or practicable will be carefully considered by the Committee, and will be reported upon to the Council at its next session." Now, that question has not been reported upon to the Council at the next session. A further question was the readjustment of the funds if any such change was made, and I looked in vain to see what the arrangement was which the Pharmacopœia Committee had to propose. I found no such statement, and I now ask again, sir, whether it is the intention of the Committee to send in a supplementary statement in regard to this question at some more suitable period?

The PRESIDENT: It was not thought to be necessary.

Dr. HERON WATSON: I suppose that those persons who are mentioned—Mr. Thiselton Dyer, Mr. Holmes, Dr. Thorpe, and Dr. Russell—are to receive some payment, and if so, is there to be a separate vote from this Council for that purpose, or is the £1250 to cover it?

The PRESIDENT: That was to be the salary which Professor Attfield was to be paid for all the work he did.

Dr. HERON WATSON: That was one of the subjects which was disapproved of when the question came up before the Council. That subject was re-committed, but I believe I am speaking accurately when I say that it was agreed that £300 should be paid to him at once, because it was for work which had been done. The question then remained open as to what was to be done with the remainder of the £1250.

The PRESIDENT: That was the salary which he accepted; he said he would not accept less. Therefore the Committee has appointed him to do the work, and he has gone on doing it. If it were referred back to the Council, you might get us into trouble.

Dr. HERON WATSON: I should be the last person to do anything to get the Council into trouble or put the Chairman of the Committee to any inconvenience. There is nothing said in this report in regard to the matter, and before the report is absolutely passed, all I wish to do is to ask these two questions, and more particularly to know whether or not it is proposed to make any communication to the Council on this subject of the salary which is to be paid in future to Professor Attfield, because I wish you to bear in mind that undoubtedly while the £300 was voted to be paid to him at once, we were to receive a further report upon the subject of the remaining £950.

The PRESIDENT: We have been following the precedents of former cases. In the first part of the year there were three sums of £500 given over to that Committee to do as it liked with. We have had £100 a year given over to us to do as we pleased with, and it was left to the Pharmacopœia Committee to decide what the amount of work was and how it was to be remunerated. You will see in this report we recommend the employment of a number of people, but put down no payment or salaries for them. You must trust the Pharmacopœia Committee to use the funds of the Council as if they were its own. You have

placed the money at the disposal of the Committee. Of course you are at liberty to go into the payment of each case and accept it or refuse it, but if that question of Dr. Attfield's payment is to be raised, I will ask you to say what payment shall be made to all the members in advance. I really appeal to the Council to place confidence in the Pharmacopœia Committee. It will do the best it can. It has taken great pains in the matter.

Dr. HERON WATSON: I should be sorry to express the smallest want of confidence in yourself, sir, to whom we owe so much, or in any member of the Pharmacopœia Committee, which, I am sure, has done an immense amount of work, or in Prof. Attfield, who, I believe, has been the backbone of a great deal of the work, which could not well be done by anybody else. All I speak to is a question of order, and the question of order is that while we are told that money has been voted in larger or smaller sums on previous occasions to this Committee to do what it pleased with, it is distinctly stated at page 165 of the Minutes of last year that the Committee recommends to the Council that a sum of £1250 should be assigned to Prof. Attfield for his services as Editor; £300 to be paid to him at once; and I submit that when this report was re-committed, so that it might be re-considered by the Committee, it was mentioned that the Council was quite ready to assent to £300 being paid to Prof. Attfield at once, and it was understood that we were to receive from the Committee further information and a further report with regard to the remaining portion of the sum.

Dr. LEECH: I shall be glad to move that the report be adopted. During the last session a great deal of work has been done by the Pharmacopœia Committee, and I have no doubt that the appointment of Dr. Tirard will greatly facilitate the work. As is well known, the Pharmacopœia has also to deal with chemistry and botany, and it is suggested—I hope it will be adopted—that men who are well known in chemistry and botany should be appointed to aid the Pharmacopœia Committee. No better names could be brought forward than those named in the report; Dr. Thorpe in Chemistry, and Mr. Holmes and Mr. Dyer as Referees in Botany. Then we have got a promise of a large amount of aid from the Pharmaceutical Society, which in former times has also given us great help. With regard to pharmacology and therapeutics, it will be seen that Dr. Lauder Brunton, Professor Fraser, and Professor Walter Smith have been asked to act as referees in those subjects. There is no doubt that a great part of the Pharmacopœia is connected with pharmacy, but questions in pharmacology and therapeutics must arise, and I believe we have the best help we can get. In regard to what has been said about payment, I would point out that although the suggestion was made that the amount was rather large, no resolution was passed, and when the report was re-committed no resolution was made on the subject. I presume the payment will stand. With regard to payments to others we hardly know yet what amount of work will have to be done. I think it was

generally agreed that we should wait and see what amount of work was done before we arranged as to payment.

The PRESIDENT: I ought to mention that there will be a considerable payment to the Pharmaceutical Society for the work it is expected to do. We cannot tell beforehand; you must trust to your Committee. We have employed the best Editor we can get, and we have offered him the smallest salary he will accept.

Mr. BRUDENELL CARTER: I have great pleasure in seconding the adoption of the report.

The report was then unanimously adopted.

THE APPROACHING REVISION OF THE BRITISH PHARMACOPOEIA

MEMORANDUM ON THE BRITISH PHARMACOPOEIA

BY THE THERAPEUTIC COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.

D. J. LEECH, M.D., F.R.C.P., Chairman.

NESTOR TIRARD, M.D., F.R.C.P. } Hon. Secretaries.
RALPH STOCKMAN, M.D., F.R.C.P.E. }

As it has been announced that a new edition of the Pharmacopœia is in course of preparation, the Therapeutic Committee thinks it desirable to set forth its views concerning certain points which seem to it to require special attention.

It is proposed to adapt the new edition of the Pharmacopœia to the use of our colonies and dependencies by introducing alternatives to many of the drugs now official, suitable to their varying requirements. Besides this, it will be necessary to make official many of the therapeutic substances recently introduced and not infrequently employed, and also some of the new forms in which medicines are now commonly administered.

Yet an increase of the size of a Pharmacopœia is to be deprecated on several grounds. A bulky Pharmacopœia, abounding in detail and containing not only the medicines in general and common use, but also those occasionally employed, may serve some purpose as a work of reference; but it is not likely to be used as such by the members of the medical profession, for it cannot contain the exact kind of information they require.

Moreover, a Pharmacopœia of large size will not be used in the daily work of the practitioner, for he will not bear in mind its contents. The greater the amount of unnecessary detail it contains, the less will he use it.

Further, although it is quite true that the Pharmacopœia is not written with any educational view, so far as the student is concerned, yet the relation of the Pharmacopœia to medical education has an important bearing on its employment by medical men. The knowledge which a practitioner has of the Pharmacopœia is largely dependent on the extent to which his work, whilst a student, is associated with it. But the numerous claims on the time and memory of the medical student and the size of the present Pharmacopœia have caused some examining boards to require

a knowledge of only a portion of the drugs and preparations now official, thereby implying that the remainder are of such little value as not to require attention.

Other examining boards, on the contrary, make all the substances and preparations in the Pharmacopœia the subject of examination, notwithstanding that a not inconsiderable number of them have admittedly fallen into disuse.

If the present Pharmacopœia be increased in bulk there is some probability that it will be even less employed than heretofore.

The Pharmacopœia is primarily intended "to afford to the members of the medical profession and those engaged in the preparation of medicines throughout the British Empire one uniform standard and guide whereby the nature and composition of substances to be used in medicine may be ascertained."

The body of the work should include all such remedies as the existing state of medical practice requires.† It should contain the methods of preparation in so far as these are of service to the medical profession and those engaged in the preparation of medicines, with the weights and measures by which they are prepared. It should contain, too, descriptions of the remedial agents included, such as may afford a clear indication of what they are intended to be, and enable those engaged in their administration to determine their identity and purity;‡ yet it should be of such size that it may be fully known and used by the members of the medical profession in their daily work, and it should, if possible, be so arranged as to form the basis of that information concerning drugs which medical men require to fit them for their daily work.

With the view of fulfilling these requirements in the new edition three modifications are necessary: (i.), elimination; (ii.), alterations; (iii.), additions.

I.—ELIMINATION.

Elimination may be carried out in three directions:

(1) By the omission of drugs now but little used, and of superfluous galenical preparations.

(2) By the exclusion of methods of preparation of medicinal substances found in commerce.

(3) By the omission of other details which seem of no value either to chemists or medical men.

(1) OMISSION OF DRUGS AND GALENICAL PREPARATIONS.

It has been often said that whenever it is suggested to omit a substance from the Pharmacopœia someone is sure to assert that this is a drug which he finds very serviceable. This may be true; but it does not seem a sufficient reason for retaining drugs which are not in common use, since the omission of a drug from the Pharmacopœia in no way prevents a practitioner ordering and obtaining the drug for his patient. The older remedies ought no more to be retained because they are much used by a few individuals or even in a few localities than new remedies ought to be introduced for the same reason.

The Committee has deemed it desirable to make a

systematic inquiry as to the extent to which certain drugs and preparations have fallen into disuse, and into the comparative frequency of employment of some compounds which possess similar properties. For this purpose a list of the principal drugs and galenical preparations concerning which information was needed, has been submitted to the members of the British Medical Association, with a request that each member should indicate whether he uses these drugs often, rarely, or never. Of this list 12,490 copies have been issued, and about one-half have been returned; the replies from 5609 have been available, and have been tabulated as follows: *

	Often.	Rarely.	Never.
Acidum lacticum dilutum	122	848	4,689
Ammonii phosphas	25	417	5,167
Antimoni oxidum	16	267	5,826
Antimonium sulphuratum	27	301	5,281
Aqua fœniculi	167	437	5,015
" lauroceras	552	1,428	5,598
" menthae viridis	460	900	4,259
" pimentæ	325	806	4,478
Argentum oxidum	180	987	4,542
Boberina sulphas	48	411	5,150
Bismuthi citras (as distinct from liquor)	118	322	5,109
Bismuthi et ammonii citras (as distinct from liquor)	237	416	4,956
Bismuthi oxidum	224	600	4,715
Calci carbonas precipitata	239	816	4,496
Carbo animalis	212	1,586	3,811
Cambogia	92	784	4,738
Cetraria	44	323	5,242
Charta epispastica	406	1,274	8,979
" sinapis	878	1,261	8,470
Cinchonidinæ sulphas	165	442	5,004
Cinchoninæ sulphas	152	580	4,877
Confectio opii	56	462	5,091
" roseæ caninæ	305	958	4,451
" scammonii	34	318	5,287
" terebinthinæ	59	378	5,177
Cupri nitras	22	168	5,419
Decoctum cetrariæ	52	284	5,273
" quercus	138	842	4,694
" taraxaci	420	1,028	4,106
Elemi	20	155	5,434
Emplastum calefaciens	362	844	4,403
" ferri	564	651	4,694
" galbani	61	480	5,118
" hydragryi	338	1,477	3,802
" opii	360	1,068	4,165
" plumbi iodidi	107	719	4,783
Extractum aconiti	94	454	5,061
" anthemidis	75	333	5,201
" belæ liquidum	222	764	4,603
" calumbæ	164	482	5,023
" cnicifugæ liquidum	102	392	5,115
" conii	354	1,399	3,856
" hæmatoxyli	292	804	4,453
" jalapæ	78	638	5,193
" lactucæ	57	627	5,025
" lupuli	94	665	4,850
" meserei æthereum	8	77	5,524
" papaveris	95	319	5,195
" paridis	68	249	5,202
" quassæ	82	258	5,239
" rhamni frangulæ	34	168	5,412
" liquidum	158	368	5,063
Ferri sulphas exsiccata	1,134	1,575	2,809
" sulphas granulata	439	702	4,468
Infusum anemidis	209	558	4,862
" catechu	175	446	4,988
" cuspariæ	54	345	5,219
" matricæ	49	480	5,180
" serpentariæ	223	686	4,750
" valerianæ	367	489	4,858
Lactuca	18	151	5,440
Liquor acidi chromici (as distinct from chromic acid)	70	163	5,396
Liquor ammonii acetatis	3,899	423	1,287
" fortior	2,635	593	2,831
" citratis	107	885	4,217
" fortior	226	391	4,992

* Preface, British Pharmacopœia, p. xii.

† *Ibid.*, p. xii.

‡ *Ibid.*, p. xiv.

* A certain number of members stated that they knew so little of these preparations that they were unable to tabulate the frequency of employment.

	Often.	Rarely.	Never.
Liquor calci chloridi (as distinct from solid)	230	700	4,670
" chlori (as prepared in the Pharmacopœia)	114	619	4,876
Liquor ferri acetatis	277	682	4,700
" iodi	446	769	4,894
" morphine bimeconatis	424	1,001	4,184
" sodæ	96	862	5,161
" sodii ethylatis	246	1,016	4,847
Lupulinum	89	286	5,284
Matico folia	67	540	4,992
Mistura creasoti	227	1,098	4,280
" ammoniaci	219	1,007	4,883
" ferri aromatica	261	977	4,851
" gualaci	460	1,380	3,819
" scammonii	32	227	5,450
Oleo-resina cubebæ	117	661	4,941
Oleum antheidii	82	268	5,819
" mentha viridis	264	718	4,682
" pimentæ	144	468	4,997
" phosphoratum	80	275	5,804
" rutæ	28	299	5,282
" sabine	41	442	5,126
Pilula aloes barbadensis	592	1,263	3,784
" " et myrrhæ	1,812	2,017	1,780
" " socotrine	507	1,092	4,010
" cambogis composita	148	895	4,566
" conii composita	216	701	4,692
" ferri carbonatis	1,049	955	3,605
" ferri iodidi	295	338	4,476
Pilula hydragryi subchloridi composita	940	1,798	2,871
Pilula phosphori	837	1,276	3,996
Piluli carbonas	77	358	5,174
" nitras	80	442	5,087
Potassa sulphurata	208	826	4,575
Pulvis antimonialis	465	1,542	3,603
" elaterini compositus	122	1,072	4,415
Pyrethri radix	17	219	5,878
Spiritus ætheris c. m. præparatus, Hoffman's anodyne (as distinguished from spiritus ætheris)	1,068	1,193	3,356
Spiritus armoracis compositus	247	881	4,481
" cajuputi	199	856	4,554
Suppositoria acidi carbonici c. sapone	87	816	5,266
" " tannici	418	1,519	3,672
Syrupus hemidesmi	90	262	5,257
" mori	196	680	4,788
" papaveris	1,073	1,529	3,007
Tinctura aurantii recentis	1,231	982	2,466
" cnicifugæ	545	768	4,811
" croci	160	398	5,111
" ergotæ	848	498	4,768
" ferri acetatis	240	558	4,811
" gallicæ	31	232	5,246
" gualaci ammoniaci	852	1,775	2,982
" jalapæ	168	684	4,810
" jarcis	117	408	5,084
" lupuli	468	1,212	3,929
" pyrethri	61	866	5,192
" sabine	18	116	5,475
" serpentariæ	202	622	4,766
" singiberis fortior (syn. es-sent. singiberis)	1,658	1,574	2,888
Trochisci ferri redacti	112	873	5,124
" opii	67	270	5,272
Unguentum antimonii tartarati	65	670	4,874
" atropinæ	237	1,014	4,368
" creasoti	128	623	4,868
" elemi	98	348	5,168
" potassæ sulphuratis	50	369	5,190
" terebinthinæ	87	342	5,180
" veratrinæ	83	634	4,992
Vilum aloes	126	464	5,019
" theli	117	700	4,792

The data thus collected have been placed at the service of the General Medical Council. Numerous letters and suggestions have also been received, giving valuable information with regard to the apparent requirements of the profession.

From the above tables it would appear that there are fifty-four drugs and preparations in this list which are never used by over 5000 practitioners, out of the 5609 who have sent replies.

It may further be pointed out that the word "rarely" has been sometimes understood to mean that these substances have been employed at some time or other,

even though not now in use. Although the frequency of employment of a drug is to some extent a guide to the need of its retention, the Committee is of opinion that the ascertained pharmacological actions and therapeutic uses of any drug or preparation in the British Pharmacopœia should also receive due consideration before deciding upon its retention.

With regard to galenical preparations it may be pointed out that the Pharmacopœia cannot constitute a guide to the methods of using drugs, and it seems desirable to follow the example of the Swiss, German, and American pharmacopœias, and exclude the cataplasmata, enemata, and vapores which are only introduced to show the way in which drugs may be employed. It is no more the duty of the Pharmacopœia to give instruction in the way of making a linseed poultice or an iodine inhalation, than it is to furnish information as to the method of giving a calomel fumigation or an alkaline bath.

(2) EXCLUSION OF METHODS OF PREPARATION.

In a large number of cases the Pharmacopœia gives the method of preparation of substances met with in commerce and never prepared by the pharmacist. Some of the methods given are not in all their details applicable when the substances are prepared on a large scale; and there is reason to believe that in such cases the pharmacopœial processes are not adhered to.

In the pharmacopœias most recently published—for example, the Swiss, German, and American—methods of making chemicals used medicinally are almost entirely omitted. It would certainly be desirable in the forthcoming Pharmacopœia that the methods of preparing such substances as citric acid, tartaric acid, hydrochloric acid, phosphoric acid, and similar chemicals should be omitted.

(3) OMISSION OF UNNECESSARY DETAILS.

The Pharmacopœia contains certain lists—for example, acetates, chlorides, etc.—which seem of no service either to those who prescribe or those who prepare medicines. These might well be omitted.

II.—ALTERATIONS.

Origin and Source of Drugs.—It is desirable not only that the origin, source, and general characters of drugs should be accurately described, but that in many instances the description should include their historical characters.

The Mode of Production of nearly every preparation in the Pharmacopœia should be carefully considered in order that preparations of the greatest pharmacological activity may be employed.

The methods of making some of the extracts might be improved.

It would be well that notice should be taken of the changes which have occurred with regard to the use of infusions and decoctions. A large number of the former and some of the latter are not now usually made according to the processes of the Pharmacopœia. The concentrated infusions and decoctions are employed alike by chemists and medical men. These concentrated compounds somewhat resemble the liquid extracts, and their value should be determined with a view of ascertaining whether it is desirable to introduce them into the Pharmacopœia. It would

save much trouble if a general formula were given for the preparation both of decoctions and infusions.

The hypodermic injections require special consideration both with regard to their strength and composition.

The pill masses of the Pharmacopœia should be less bulky than they are; the same amount of active material might in many instances be combined with a smaller bulk of excipient.

The tinctures might be made more active and reliable by a careful determination of the menstrua in which the active principles of drugs are most soluble, and a careful examination should be made to see how far a standardisation of certain tinctures can be carried out.

The formulæ for many of the lozenges require reconsideration.

Many of the ointments are unsatisfactory. It seems probable that two or three bases for ointments might be introduced suitable for various purposes according to their melting point. If this were done several of the present ointments might be omitted.

Tests for Purity.—The tests for the recognition of the purity of drugs in the Pharmacopœia are in need of complete revision. Chemistry has made considerable advances since some of them were introduced, and it is desirable that they should be replaced by others in accordance with present chemical knowledge.

Dosage.—The doses in the Pharmacopœia are in many cases unsatisfactory, and require careful supervision. It is very necessary that they should be revised by therapeutic experts.

Weights and Measures.—The metric system of weights and measures should be introduced, the equivalent in avoirdupois weight and imperial measure being added as alternatives. In the Pharmacopœia for 1885 a great advance was made by the parts and fluid parts of the materials used in galenical compounds being given in many instances, as well as the weights and measures in grains and ounces. The principle then adopted might be still further extended. The general employment of the cubic centimetre for liquids and the gramme for solids as in the American (U.S.) Pharmacopœia might with advantage be adopted.

III.—ADDITIONS.

Alternatives for the Use of Colonies and Dependencies.—It is doubtless desirable that information concerning the use of drugs in the colonies and dependencies should be obtained, but the Committee suggests that it is inadvisable to delay the publication of a new pharmacopœia on that account. The alternatives to be employed might be issued at a later date as an appendix.

New Preparations of Old Drugs now Official.—Whilst it may be necessary to adopt some of the new preparations now in general use, care should be taken to incorporate only those for the admission of which some definite pharmaceutical or therapeutic reason exists.

In one or two directions it is manifest additions must be made to the preparations in the Pharmacopœia. For example, it contains an abundance of colouring syrups, but comparatively few compounds

for giving pleasant flavour to medicines. It will probably be necessary, too, to make official some of the more convenient and portable forms of medicine which are now commonly used by the profession. The large 5 grain pills of the Pharmacopœia have been, to a great extent, superseded practically by the small pilule and granule, and medical men now often carry with them medicines in these portable forms.

New Drugs.—Much difficulty will be found in deciding on the claims of the large number of new agents recently brought before the notice of the medical public. They can scarcely be decided upon the extent to which these various new remedies have been employed, since this is to some extent determined by the energy with which they have been advertised.

Before deciding on the introduction of new remedial agents, it would seem very desirable that special information concerning their actions, uses, and doses, should be obtained from those accustomed to pharmacological and therapeutic investigations.

Note on Proprietary Articles.—In previous editions proprietary substances have been introduced under a new name, for example, phenazone (antipyrine); at times, also, imitations of proprietary articles that have attained celebrity have been inserted into the Pharmacopœia under the same or another name. Both courses are open to grave objections. If a proprietary preparation be adopted, it seems hardly worth while to change its name. The introduction of imitations is attended with two difficulties; if the process given follow closely that which is used for making the proprietary article, a patent may be infringed.

On the other hand, if the process employed differ from that by which the proprietary article is obtained, the pharmacopœial product may be inferior, and the proprietary preparation may continue to be used. It must be confessed that the question of the proprietary compounds is full of difficulties which can only be solved by seeking the aid of experts.

The Committee also feel that as few new synonyms as possible should be introduced into the Pharmacopœia.

In the opinion of the Committee it is highly desirable that there should be a Medical Editor in addition to the Pharmaceutical Editor, and that there should be associated with them a Committee of those having special knowledge of pharmacology and therapeutics.

THE HYDROGEN WALL IN ELECTROLYSIS.—To obtain a greater efficiency in the reduction of the highly electro-positive metals, such as potassium, from aqueous solutions, Mr. L. Pyke, at the recent Royal Society soirée, showed the "hydrogen wall" (*Electrical Engineer*). He produces an amalgam of the metal under reduction by placing the mercury cathode in a porous vessel. The amalgam is in its richest condition at the top of the porous vessel, which is the part furthest removed from the liquid. The precise action of the device is said to be the prevention of the liberation of hydrogen at the electrolytic contact surface.

FIXED OIL OF CARAPA GUIANENSIS.

BY E. H. GANE.

Some time ago I received from Mr. E. M. Holmes, curator of the Museum of the Pharmaceutical Society of Great Britain, a sample of fixed oil obtained from the seeds of the above-named plant, with the request that I would examine and report on it. The sample in question had been exhibited at the Colonial and Indian Exhibition, and had been presented to the Museum by Mr. C. Fresson, of British Guiana, from which country the oil was obtained. The oil is reputed to possess anthelmintic properties, and to be a powerful insecticide; it is used by the Warau Indian women for anointing the hair, and popularly known as "crab oil," a term which may refer to its insecticide properties, or possibly be a corruption of the word *carapa*.

The genus *Carapa* belongs to the natural order Meliaceæ, an order more or less allied to the Rutaceæ, and containing several plants which yield valuable timber, the principal being the mahogany tree. The tree grows in Guiana to a height of from 60 to 80 feet, and yields a timber which takes a fine polish, and is used for ornamental work. The bark of the tree is used by the Indians as a febrifuge, and is said to be equal to quinine for that purpose. It is astringent, of a deep red colour, and very bitter. The seeds contain no endosperm; but have each two large oily cotyledons, and on expression yield the fixed oil readily.

The oil is liquid at temperatures above 20° C., but solidifies below that point to a creamy consistence, and if strongly cooled hardens considerably, but leaves a liquid oily portion intermingled, with the solid lumps. The liquid portion is principally olein. The oil had, when I received it, a peculiar, somewhat rancid odour and a nauseous bitter taste. The specific gravity at 15° C. is 0.923. On warming with water acidulated with acetic acid the bitter principle is removed from the oil, and the aqueous solution precipitates with the usual alkaloidal reagents, showing that the bitterness is due to an alkaloid or alkaloids. Mineral acids do not remove the bitter principle, from which I conclude that it is hydrolysed by strong acids, and subsequent experiments tended to confirm this. The amount of alkaloid present, however, was too small to enable any definite statements to be made. Free fatty acid was present to a considerable extent in the sample, between 15 and 16 per cent. calculated as oleic acid. This was determined in the usual way by solution in alcohol and titration with semi-normal solution of soda, phenolphthalein being used as an indicator. A systematic examination of the oil was then made in the following manner:—One hundred grammes of the oil were saponified by alcoholic potash, a clear solution resulting, showing absence of unsaponifiable matter. The resulting soap was decomposed with dilute sulphuric acid, and the liberated fatty acids were boiled with successive quantities of water, using an inverted condenser, and finally distilled in a current of steam in order to separate the lower volatile fatty acids. The successive

washings and the distillate were then collected and distilled to separate the acids, the successive portions being neutralised with semi-normal soda. The resulting salts were then isolated by evaporating to dryness and examined, and found to consist of sodium butyrate, with a faint trace of acetate. The total acid present calculated as butyric was only 6 per cent. The insoluble fatty acids were then examined. The mixed acids were of a soft consistence, and began to melt at 23° C., but were not completely liquefied until the temperature rose to 30° C. A definite weight was then exactly saponified with semi-normal soda in alcoholic solution, phenolphthalein being employed as an indicator, and the resulting soap transferred to aqueous solution, and the liquid precipitated with neutral lead acetate solution. The lead soaps were well washed with water and alcohol, and digested in ether to remove soaps of the oleic acid group. The ethereal solution was filtered off and the filter washed with ether till free from lead. The filtrate was then decomposed with dilute HCl, when oleic acid and its homologues will pass into solution in ether. The solution was washed, transferred to an open dish, the ether evaporated off, and the residue weighed. Subsequent examination showed it to be pure oleic acid.

The lead soaps insoluble in ether were then decomposed, and the higher fatty acids collected. The separation of these was a long and most tedious operation. The method employed was to dissolve to saturation in alcohol, and fractionally precipitate with magnesium acetate also in alcoholic solution. The solution and precipitation had to be performed some twenty-five times before a satisfactory separation could be obtained. The mixed acids were found to consist of stearic and palmitic acids, the former in great preponderance. No quantitative determinations of the two were made.

The aqueous solution after saponification and separation of the volatile fat acids was examined and found to contain glycerin and sulphuric acid alone. No other alcohols were detected. The constituents of the oil are then free fatty acid, glycerates of oleic, palmitic and stearic acids, and a small amount of a bitter principle of an alkaloidal character. The latter is probably identical with the principle present in the bark of the tree. Experiments were also made to determine the physiological properties of the oil. Administered internally it possesses slight purgative properties, but the taste is too nauseous to admit of its employment as such. As an insecticide it is evidently of considerable value. Insects will quickly steer clear of it if it be daubed on trees frequented by them, and when made into a soap and the soap dissolved in water, and the solution used as a spray, it forms an efficient insecticide for greenhouse or outdoor plants. Prolonged boiling, however, destroys the activity of the resulting soap, owing to decomposition of the active principle by the caustic alkali. There is probably not a large field for the use of this oil in pharmacy, but for soap and candle making it might advantageously be substituted for some of the vegetable oils at present in use, particularly if it can be produced, as appears possible, at a reasonable cost.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JUNE 15, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

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Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Bremridge, — 17, Bloomsbury Square, London, W.C.

TOWARDS AN IDEAL PHARMACY LAW.

MORE than a third of the latest number of the *Apothecary* is occupied by the draft of a proposed Pharmacy Law, in which the Editor, Professor OSCAR OLDBERG, has attempted to embody his views upon pharmaceutical education and legislation. At the outset care has been taken to emphasise the necessity of recognising the fact that, in America, no less than in this country, regulation of the practice of pharmacy by law is not possible except for the purpose of protecting the people and the public health. Accordingly, the title of the proposed Act is made to read, "An Act to Regulate the Sale of Drugs, Medicines, and Poisons, for the Protection of the Public." Retail drug shops it is proposed to classify into three kinds, depending upon the qualifications of the persons in charge. Thus, individuals with good educational qualifications of the highest class are to be called "Registered Pharmacists"; those with moderate educational qualifications "Registered Assistant-Pharmacists"; and a still lower class, consisting of individuals possessing no special educational qualifications, "Licensed Druggists." Drug shops of the first class would be complete pharmaceutical establishments where physicians' prescriptions could be compounded and all other kinds of pharmaceutical work done, a registered pharmacist being in charge, and the premises sufficiently well equipped for serving their legitimate purpose. A shop of the second class need have only a registered assistant in charge, but poisons and potent remedies generally may not be dispensed or sold there. If, however, at any time a registered pharmacist should take charge of such a shop it would, by virtue of the change in management, become advanced to the position of a first-class

establishment. Finally, licensed drug stores of the third class would obviate the practical difficulty which certain Boards of Pharmacy are said to have experienced, in enforcing the requirements of pharmacy laws which insist that a registered pharmacist shall be in charge of every drug store, whether or not the business of that drug store warrants the requirement that a pharmacist of high qualifications should be in charge of it. By the adoption of this system, it is pointed out, it will be entirely practicable to insist upon sufficiently high qualifications for the performance of the most important pharmaceutical work, whilst less stringent requirements will serve in the case of individuals doing less important work, and all educational qualifications can be suspended for purely commercial traffic in such things as patent (?) medicines and ordinary domestic drugs.

With regard to apprentices or pupils, it is proposed that before entering upon the study of pharmacy they shall have graduated from a high school or possess a general education equivalent to that required for such graduation. They may also be required to have attained the age of eighteen years, and must prove to a Board of Pharmacy that they are fit and proper persons to become "Registered Students of Pharmacy," the Boards being empowered to refuse registration to applicants known to be of very bad moral character, or to be drunkards, opium-eaters, etc. Subsequent to registration they must undergo a four years' course of training in pharmacy if they intend to take the highest qualification, two years in a drug shop of the first class and two at a recognised pharmaceutical school, so that no one would be able to become registered as a pharmacist of the highest class before he had attained the age of twenty-two years. A reasonable measure of compulsory special education is invariably to be followed by examination, whether the students be graduates of colleges of pharmacy or not. The examination successfully passed, the candidate would be entitled to registration as a pharmacist of the first class. If, however, he is content to become a registered assistant-pharmacist only, he can save one year's attendance at the school of pharmacy and may become qualified when twenty-one years old. The examination would also be more limited in its scope than that for the higher qualification, micro-pharmacology, organic chemistry, analytical chemistry, and pharmaceutical assaying being omitted at the discretion of the Boards of Pharmacy. Annual licences would be granted in either case, the holders being entitled to renewals for the rest of their natural lives.

The key to the whole situation, according to Professor OLDBERG, is that sufficient compulsory preliminary education is more necessary than all other requirements put together, and it may be remarked,

parenthetically, that there is good reason for believing that the same holds true for Great Britain. Evidence of this preliminary education being forthcoming, he sees no objection to registered students being permitted by law to assist registered pharmacists and assistant-pharmacists in doing technical pharmaceutical work. This, of course, would be essential to acquiring a practical knowledge of pharmacy as actually practised. Registered assistant-pharmacists, when employed in drug shops of the first class, would be permitted to dispense poisons or other potent remedies, but only when under the control of registered pharmacists of the first class. This regulation would be quite in accordance with British precedent, and could hardly be objected to with reason. With regard to licensed drug stores of the third class, they would, of course, only be permitted in localities where drug shops of the first or second class did not exist. The Board of Pharmacy for a given district would not only grant the necessary licences but also have the right to declare what substances should be regarded as constituting common or domestic remedies. As an argument in favour of dispensing with all educational requirements in the case of the proprietors of these stores, it is stated that retail druggists have of late complained of great hardship in being obliged to pass State Board examinations simply for the purpose of conducting a shop in which scarcely any real pharmaceutical work is done; and, of course, the distinction between different retail druggists and between different retail drug shops "must depend upon the character of their work from the standpoint of the art of pharmacy and protection to the public health, and not at all from the standpoint of commerce." A similar arrangement, it may be mentioned, exists in Victoria, where it is found to work very satisfactorily, but it is doubtful if any place in this country is so far remote from a pharmacy as to justify such a concession in a British Pharmacy Act. It is unnecessary to consider further the details of Professor OLDBERG's draft Pharmacy Act, since enough has been said to illustrate its chief features. A perusal of the whole of its fifty sections, however, will be found of considerable interest to everyone interested in pharmaceutical education and legislation in English-speaking countries.

PRIEST AND MEDICINE-MAN.

In rude tribes, says Mr. HERBERT SPENCER in the *Contemporary Review*, it is difficult to distinguish between the priest and the medicine-man, their respective functions being commonly fulfilled by the same person. Thus, in different districts, the same persons are found acting as priests, jugglers, and physicians; quacks, jugglers, and priests; priests, magicians, and doctors; priests, prophets, and doctors; or fetich-

men, doctors, priests, and witch-finders. The origin of this union of functions is referred to the fact that the primitive priests and medicine-men both dealt with supposed supernatural beings. With the Nootka Sound people, "Natural pains and maladies are invariably ascribed to the absence or other irregular conduct of the soul, or to the influence of evil spirits, and all treatment is directed to the recall of the former and to the appeasing of the latter." Again, in the case of the Okanagans, "the sickness becoming at all serious or mysterious, medical treatment is altogether abandoned, and the patient committed to the magic powers of the medicine-man." To quote other examples, the Tahitian doctors are almost invariably priests or sorcerers, and the Mongols seldom separate medicine and prayers, the medical function of the priest evidently originating in the belief that diseases are caused by angry gods, or indwelling demons who must be driven out of the afflicted patients.

The gradual evolution of the physician from the priest, properly so called, is shown to be concomitant with increased knowledge of medicinal agents, which gradually ceased to be regarded as acting supernaturally. The early civilisations show the transition, and also illustrate the differentiation of function that gradually took place. Egyptians, Babylonians, Assyrians, Chaldeans, Hebrews, Hindoos, Greeks, and Romans have all left conclusive and concordant evidence of the direction in which progress took place. The early Christians, too, were no exception to the rule, the pagan conceptions of disease and its treatment reasserting themselves in their case. In mediæval France the clerical practice of medicine only declined when a papal bull permitted physicians to marry, and in this country, a statute of HENRY VIII. prohibited any person from practising as a physician or surgeon in or near London, "without examination and licence of the Bishop of London, or of the Dean of Paul's, duly assisted by the faculty; or beyond these limits, without licence from the bishop of the diocese, or his vicar-general, similarly assisted." Again, the division of medicine-men into physicians and surgeons seems to support the idea of the maintenance of a distinction of long standing; physicians originally dealing with evils inflicted by supernatural means, while surgeons treated injuries caused by purely mundane agencies.

Mr. SPENCER further remarks that "it is alleged that down to the early part of our own century there remained with the Archbishop of Canterbury a latent power of granting medical diplomas." This power, however, was not only possessed but actually exercised in quite modern times. According to the Schedule (A) of the Medical Act (1858) amongst the persons entitled

to registration are those holding the degree of "Doctor of Medicine by Doctorate granted prior to passing of this Act by the Archbishop of Canterbury," and the 'Medical Register,' so recently as the year 1882, contained the following entry:—
"CRONIN, EDWARD, Claremont House, Brixton, London, S., M.D. by Doctorate granted by the Archbishop of Canterbury, Sept. 13, 1858." This is of especial interest because Dr. CRONIN appears to have possessed no other qualification. The degree was of practical value therefore in quite recent times, and not merely ornamental. The *British Medical Journal* states, also, that a holder of the Lambeth M.D. degree died only a few months ago. It seems fairly established, then, that our leading philosopher is not too far fetched in his ideas when he suggests that "the separation between 'soul-curer and body-curer,' which goes on as savage peoples develop into civilised nations, has but very gradually completed itself even throughout Christian Europe."

DOG POISONING.

THERE has been a good deal of correspondence in the metropolitan daily press of late on the subject of dog poisoning in country districts. The Poisoned Flesh Prohibition Act appears to be infringed continually, gamekeepers and others laying down poisoned flesh for the destruction of "vermin," and this flesh being frequently eaten by valuable dogs with fatal effect. Strychnine seems to be the favoured poison for the purpose, but it is either purchased at a distance or given away to avoid the necessity of registration. At any rate, local chemists are able to give no information respecting the matter.

Some light is thrown upon the question of supply by two correspondents of the *Standard*, who independently quote the experience of a Sussex veterinary surgeon. This gentleman received from a London firm of wholesale druggists a hamper which proved to be intended for a local farmer. The farmer was addressed as veterinary surgeon, and the recipient of the hamper being the only veterinary surgeon in the district, it was naturally delivered to him, as well as the invoice which came by post. An ounce of strychnine was amongst the goods, and the veterinary surgeon felt it incumbent upon him to direct the attention of the wholesale druggists to the fact that their customer was a farmer only. In reply they told him it was none of his business, and stated that they always executed prepaid orders to anyone who desired them to do so, "which was the custom of the trade."

That any such custom prevails in the trade it is unnecessary here to do more than simply deny. It may be well, however, to point out that sales of poisons of the nature of that cited, are distinctly illegal. The business of wholesale dealers

in supplying poisons is only exempted under the Pharmacy Act, 1868, in so far as they supply them "in the ordinary course of wholesale dealing." Transactions with private individuals who require poisons for their own use are not covered by this exemption, and it is quite possible, therefore, that if satisfactory evidence of such illegal sales were forthcoming, the Pharmaceutical Society would be able to move in the matter and check a practice which is both unworthy of any respectable wholesale house and pernicious in its tendencies.

ELECTION OF NORTH BRITISH EXECUTIVE.

THE large number of candidates for election to the Executive of the North British Branch of the Pharmaceutical Society affords a healthy indication of the great interest taken in corporate affairs by Scottish pharmacists. At the meeting on Friday next the result of the election will be announced, seventeen being selected from a list of twenty-eight. Voting papers must be returned by Thursday next, June 20.

PHARMACOPŒIA REVISION.

THE memorandum on the British Pharmacopœia issued by the Therapeutic Committee of the British Medical Association (see p. 1146), for a copy of which we are indebted to the courtesy of Dr. TIRARD, contains matter of considerable importance in connection with the work to be carried out, and we are glad to have the opportunity of calling the attention of pharmacists to it. The points dealt with in the memorandum under the several heads of elimination, alterations, and additions, will naturally be of interest to pharmacists, and they should form material for comment, from the pharmaceutical point of view, with the general object of assisting in the production of a national pharmacopœia suited to present requirements. In that respect the statistical information collected by the Committee appears to suggest a possible elimination of articles from the Pharmacopœia which would reduce the bulk of the volume, besides leaving room for improvements in the definition of those retained, more in keeping with existing knowledge and conditions. We hope to receive communications on the subject for publication in the Journal.

TOXICITY OF FLUORIDES.

THERE is no doubt, says the *Pharmaceutische Centralhalle*, that the fluorides will soon find extensive application both as preserving agents for food and as antiseptic medicines. Their progress seems only to be checked by the fears entertained of their poisonous nature. Experiments made with animals, however, show that they can take immense quantities of fluorides with perfect impunity, and even after continued use no poisonous effects result. TAPPEINER finds that although so-

dium fluoride is more poisonous than other alkaline salts, it would be necessary for an animal of one thousand pounds weight to swallow at least one thousand litres (beer refuse?) per day before toxic effects would ensue. He reckons that a fatal dose would have to consist of 0.5 Kilo. to each Kilo. of body weight. Goats and dogs have also been experimented upon, and given daily for three months from 0.3 to 0.5 Gm. sodium fluoride with their food, without being any the worse for their experience. In the case of the former the milk was even not in the least affected. The effects produced on human beings seem, however, much less favourable. A. G. BLOXAM (*Chem. Zeitg.*) purposely consumed a piece of salmon which had been lying for three months in a five per cent. solution of sodium fluoride. After eating, salivation set in at once, followed by sickness and diarrhoea, and in the night the circulation became very slow. He estimates the quantity of sodium fluoride consumed to have amounted to about 5.5 Gm.

RE-STAMPING WEIGHTS.

AN important communication on this subject will be found at page 1158, where Mr. YEWDALE draws attention to the fact that the practice of charging tradesmen for re-stamping weights, and presumably measures also, appears to be not in accordance with the statute, when the re-stamping is done without the owner's authority. The matter is of great interest to chemists, for the practice of re-stamping without permission is a very general one. So far as any opinion can be based upon the Weights and Measures Act itself, it would appear that any inspector who tells a chemist to have his weights, etc., stamped again, when they are not found to be false or unjust under the Act, is not entitled to claim any fee for such re-stamping, and any local authority which instructs its inspector to demand such fees is exceeding its powers. With regard to the repayment of sums already paid it remains to be seen what action will be taken by the various local authorities respecting other than quite recent charges, and those voluntarily incurred. The amount paid for re-stamping during past years must be considerable, and in individual cases it may be thought worth an attempt at recovery. It may be, however, that payment having been made in most cases without protest, it would be held that the action of the inspectors had been acquiesced in. At any rate, a decided stand should be made against the tendency to re-stamp weights and measures that are not false or unjust, since section 45 of the Weights and Measures Act, 1878, makes it quite clear that a weight or measure once duly stamped is not liable to be re-stamped unless found to be false or unjust, even if used in any other district than that in which it was originally verified.

ELECTION TO THE WELSH GIRLS' SCHOOL.

MR. ISAAC T. LLOYD, of King's Road, Chelsea, communicates the pleasing information (see p. 1158) that MARY MARGARET LEWIS is one of the successful candidates at the recent election. As already stated on several occasions, many chemists have taken considerable interest in this case, and we have much pleasure in being able to announce that their efforts have at length proved successful.

Transactions of the Pharmaceutical Society of Great Britain.

DONATIONS.

At a meeting of the Library, Museum, School, and House Committee, held on Wednesday, the 12th inst., the Librarian and Curator presented the following reports of donations to the Society's Library, Museum, and Herbarium:—

To the Library (London).

Royal Institution of Great Britain:

Proceedings, 1894.

List of Members, 1894.

Professor E. Schaer, Strassburg:

Die Verflüssigung des Chloralhydrates mit Phenol und mit Stearopten, etc., 1895.

Bemerkungen über unterschwellige (hydroschwellige) Säure, 1894.

Die historische pharmaceutisch-medicinische Sammlung des Apothekers Burkhard Reber in Genf, von F. A. Flückiger, 1894.

Professor J. Wiesner, Vienna:

Der Upas-Baum, 1895.

Ueber die Epitrophie der Rinde und des Holzes bei den Tiliaceen und Anonaceen, 1894.

Beobachtungen über die Anisophyllie einiger tropischer Gewächse, 1894.

Bemerkungen über den factischen Lichtgenuss der Pflanzen, 1894.

Professor Dr. R. Kobert, Dorpat:

Arbeiten des Pharmakologischen Institutes zu Dorpat, 11.12. Bandchen, 1895.

Imperial Botanic Garden, St. Petersburg:

Acta, tom. 13, fasc. 2, 1894.

Imperial University of Japan:

Mittheilungen aus der medicinischen Facultät, Bd. 2, no. 2; Bd. 3, no. 1.

Pharmacy Board of Victoria:

Report for 1894.

The Government Printer, New South Wales:

The flowering plants and ferns of N.S.W., by J. H. Maiden, part 1, 1895.

American Pharmaceutical Association:

Proceedings, 1894.

University of London:

Calendar, 1895.

To the Library (Edinburgh).

Mr. David MacLaren, Edinburgh:

Minute Book of the Wilsonian Association, Edinburgh, 1862-67.

Pharmacy Board of Victoria:

Report for 1894.

American Pharmaceutical Association:

Proceedings, 1894.

To the Museum.

Dr. G. Watt, Calcutta:

Dried papaw juice.

Mr. C. F. Moore, Dublin:

A piece of cinnamon wood cut fifty years ago.

Mr. P. Squire, London:

Fresh fruits of Indian bael.

Messrs. Schimmel and Co., Leipzig:

Specimens of oil of cypress, *Nigella sativa*, *Peucedanum officinale*, and neroli (artificial), guaiacum wood; linaloe wood from Mexico, and Cayenne; anise bark, and Nim seed.

To the Herbarium.

Mr. F. W. Burbridge, F.L.S., Botanic Gardens, Trinity College, Dublin:

Specimen of an asafetida plant in flower.

Mr. J. P. A. Wilson, Johore:

Specimen of the ipecacuanha plant cultivated at Johore.

Mr. T. Hanbury, F.L.S., etc.:

Specimen of *Phellodendron amurense* in flower.

Proceedings of Societies in London.

CHEMICAL SOCIETY.

A meeting was held on Thursday, June 6, at Burlington House, the President, A. Vernon Harcourt, F.R.S., in the chair.

The following papers were read :—

ON THE MOLECULAR REFRACTIONS OF DISSOLVED SALTS AND ACIDS.

BY DR. GLADSTONE, F.R.S., AND W. HIBBERT.

In 1870 (*Journ. Chem. Soc.*, xxiii., 101) it was shown that if the specific refractive energy of a liquid be represented by the formula $\frac{\mu-1}{d}$ when μ =refractive

index and d =the density of the liquid, then this refractive energy is a constant not affected by temperature.

Further, if the refractive energy of solids be determined by solution in a solvent as water, the specific refractive energy of the solid body is not changed on undergoing solution, either in a saturated solution or on infinite dilution. The present investigation was undertaken in order to determine whether this law was rigorously true, or if it was only an approximation.

It was found that the number of solids which could be used in the investigation was limited, since most compounds are crystalline and give two or three indexes of refraction. Finally, about fifteen compounds were obtained which were subjected to examination. The results—the specific refractive energy and the dilution—were plotted as a curve with the ordinates of specific refractive energy $\left(\frac{\mu-1}{d}\right)$ and the abscissæ of parts of water to one of the compound.

The effect of saturated solutions was first noted, and it was found that with acids such as hydrochloric, hydrobromic, and hydriodic, there was a large increase in the specific refractive energy on passing from the liquid state to that of a saturated solution. Acetic acid undergoes a similar change on solution. In the case of salts as sodium chloride, etc., there is little or no change on solution, whilst with silver nitrate the change is in the opposite direction, viz., there is a decrease in the specific refractive energy on solution.

In the case of very dilute solutions it is probable that the above law is only approximately true. Acids (except acetic) and the chlorides do not obey the law, the refractive energy increasing or decreasing in certain instances as dilution proceeds.

Nitrates and sulphates, however, exhibit no change on dilution, whilst with sulphuric acid, though there is no change on initial solution, there is first an increase and then a decrease on increasing dilution.

These changes also occur in the case of the magnetic rotation, as shown by the results of Dr. Perkin.

The laws thus laid down in 1870 appear to be true only for nitrates, sulphates, and organic substances, whilst for other substances there is a slight deviation

from the law. It is probable, however, that the refractive energy of compounds does not alter on solution, but that the alteration is due to chemical change in the compound itself, which is brought about by solution, and thus depends on the nature of the solvent.

Water of crystallisation does not affect the molecular refractive energy, and the change cannot, therefore, be due to hydration. The osmotic theory of solutions depending on the gaseous condition of the dissolved substance is not confirmed by this investigation.

The law first enunciated probably holds good within narrow limits for salts, but with larger variation in the case of acids, and the departure from the law is probably due to a re-arrangement of the atoms consequent on solution.

A COMPARISON OF SOME PROPERTIES OF ACETIC ACID, AND ITS CHLORO- AND BROMO DERIVATIVES.

BY S. PICKERING, F.R.S.

It was found, on tabulating certain physical constants as the boiling points, specific gravity, heats of fusion, of dissolution, etc., and the magnetic rotation of acetic, monochlor-, dichlor-, and trichlor-acetic acids, that there were certain regularities to be observed in the differences between the numbers of the different members of this series. In some cases, however, acetic acid is exceptional, and there is no similarity in the differences between acetic acid and the three chloracetic acids.

In other cases, however, as in the case of the heats of fusion and the freezing points, there are points of similarity between acetic acid and the dichlor-acetic acid, on the one hand, and between monochlor-acetic and trichlor-acetic acids. The following table shows some of these cases :—

Acid.	Boiling point.	Heat capacity (specific heat).	Freezing point.
Acetic.....	118°	32.63	16.9°
Dichlor-.....	194°	49.44	10.8°
Monochlor-.....	189°	40.36	61.2°
Trichlor-.....	197°	58.44	59.1°

In the course of the work four modifications of monochlor-acetic acid, differing only in their melting point, were obtained. In the case of the chlor- and brom-acids, it is noted that the heats of dissolution are parallel except in the case of the monobrom-acid which, however, may be explained by assuming the existence of a similar set of isomers to monochlor-acetic acid.

The following papers were taken as read : “ $\beta\beta$ -Dinaphthyl and its Quinones,” by F. D. Chattaway, D.Sc., Ph.D.; “Action of Benzaldehyde on Phenyl Semicarbazide,” by G. Young, Ph.D.; “Acid Compounds of some Natural Yellow Colouring Matters,” by A. G. Perkin and L. Pate; “The Interaction of Sulphur and α -Nitronaphthalene,” by A. Herzfelder, Ph.D.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, May 16, Mr. H. T. Durant, Vice-President, in the chair, and the following paper was read on:—

PLANT DISTRIBUTION.

BY J. ROBERT WALKER.

In dealing with this subject it is not my intention to give a detailed account of the floras peculiar to various countries, but rather to simply touch upon some of the leading principles of plant distribution. Plants, though possessing the means of spreading themselves over the greater part of the globe, are restricted from doing so indefinitely by various influences, of which the chief are climate and geographical drawbacks. We are aware that where a moist and cool atmosphere is essential to the growth of some plants, others do not flourish in such; or, again, that whilst a tropical climate is necessary for the culture of many species, it is disastrous in its effects upon others. But though the requirements of heat or cold differ for the various species, all plants grow best within a certain range of temperature, and each has its own zero, below which it will not thrive. Excessive heat and intense cold have alike a destructive influence upon the plant.

Some botanists, of whom Meyen may be specially mentioned, have drawn up "zones of vegetation" based upon the climatal difference of bands drawn round the earth parallel to the equator and proceeding to the poles; but in such plans the varying altitude of the earth's surface has not been taken into account, hence there must necessarily be very uneven temperatures in different parts of any one zone. For this reason these "zones of vegetation" have been abandoned, and what are known as "isothermal lines" are now used to indicate the regions of similar plant life, each line connecting spots on the earth's surface which have the same annual temperature, and hence the lines are not identical with the parallels of latitude.

It will be evident that plants growing on the summits of equatorial mountains are such as will also flourish at a low altitude in regions far away from the equator; indeed, in some cases, polar regions.

The type of vegetation existing in dry climates differs very considerably from that found in countries with a regular and constant rain-fall. In the former case we have the structure of the plants succulent in the interior, but their outer covering is tough and leathery—a provision against undue transpiration. Or the plants may be possessed of bulbs or fleshy leaves, or they may have their outer integuments covered with a resinous exudation or thick coating of hairs, each and all of these enabling the plant to resist a continuous absence of rain. Of such plants illustrations are seen in the cacti and euphorbias. Plants growing in moist climates, on the other hand, are characterised by their pliability and the more delicate structure of their epidermis or coverings, there being no need for the storage of water and prevention of too rapid transpiration.

This, then, shows the influence of climate upon the distribution of vegetable life, and though it is the most

important, yet it is not the only important condition. There is no doubt that the distribution is much affected by, and indebted to, the carrying power of water, wind, and animal life, about each of which a few words may be said in turn. The effects of marine currents are seen in the occurrence of the coco-nut palm upon the shores of most, if not all, of the Pacific Isles. The winds are responsible for the conveyance of the minute spores of the cryptogams, and though not to the same extent, those of the phanerogams.

The furs of wild animals are a useful means of carrying seeds for long distances, and migrating birds effect the same purpose, voiding many seeds in an uninjured state. But there is another side to the influences which animals have upon vegetation, and that is, they may destroy plant life of various types, as when districts are raided by locusts or other insect pests. Man also has taken his share in the extension and extermination of the vegetable world, cultivating the useful varieties of plants, destroying the useless. Some members of the natural orders Leguminosæ, Compositæ, Filices, and some few others, occur in all regions. Other plants are of very rare occurrence, as for instance, insular plants, where the islands are so far distant from any country that the transportation of their seeds is out of the question. Still, we find similar plants in several districts between which there seems to be no connection. Their origin cannot be traced to any of the influences already mentioned so we have to look for an explanation elsewhere. It is suggested that, as the dry land has been at various times submerged beneath the surface of the sea, communication has been created between different parts of the earth previously isolated, and that plants have by this means been transported from one point to another, and so when [the] elevation of the land has again taken place such plants have continued to thrive in their new localities, and these localities are separated from one another by a seemingly insurmountable distance.

There are eight principal regions of the earth producing distinct types of vegetation. In the equatorial zone we find the most profuse and luxuriant, owing to the combined heat and sufficiency of moisture. The trees are large, with trunks of enormous diameter, the flowers display a varied and pleasing brilliancy of colour, and aerial plants abound, weaving the forests into dense networks of vegetation. Palms, bananas and orchids are on every side, whilst those curious and interesting anomalies—the pitcher plants—here ply their trade for the entrapping of insect life. One curious plant peculiar to this zone is the rafflesia, whose flower has a diameter of 3 feet. The plant is a parasite of fungoid structure and possessing neither stem nor leaves. Rivalling this is the aristolochia or snake root, so called from its supposed value in curing snake-bites. It bears helmet-shaped flowers, in some cases large enough to be worn as caps by the Indian boys in the Brazilian woods. In this zone we also find some of the most sterile tracts of land, notably the Sahara desert and a portion of Arabia. These districts owe their lack of vegetation to their waterless condition.

The tropical zones, again, exhibit palms and bananas, but a distinctive character is given to the zones by the prominence of tree ferns and pepper plants.

In the sub-tropical zones palms and bananas are still in evidence, but in decreasing numbers. Arborescent grasses are a noticeable feature; and myrtles, acacias, and heaths flourish. Evergreen shrubs begin to make their appearance in the warmer temperate zones, and oaks, beeches, chestnuts, and pines are abundant. The vine here attains its most perfect development; and such trees as the pomegranates, when bedecked with their brilliantly-coloured blossoms, create a striking feature in the landscape.

Shrubs, such as roses and brambles, are distributed throughout the cooler temperate zones, and these are the homes of the ivy and hop. It is here that the vegetation presents such contrasting appearances in summer and winter—the leaves falling from the trees, and herbs dying down as winter approaches. Conifers are especially characteristic of the sub-arctic zone; rhododendrons, sedges, and lichens of the arctic zone; and herbaceous perennials, such as the saxifrages, of the polar zone, where also the cryptogams predominate, lichens being especially abundant.

As regards the relative distribution of cryptogams and phanerogams, it would appear that the proportion of the latter to the former is much larger near the equator, but as we proceed from the equator to the poles this proportion decreases. The proportion of monocotyledons to dicotyledons increases as we recede from the equator to the poles; and, as a rule, the moister the climate the greater the proportion of monocotyledons.

The history of our vegetation, as well as that of bygone periods, is arrived at by studying the remains and traces of plants which are met with in most stratified rocks which have been produced by successive geological changes of the earth's surface. From the results of such researches we are led to believe that the earliest forms of vegetation consisted entirely of cellular plants, such as mosses and lichens, and that there has been a gradual increase in complexity of structure up to the present time.

The fossil plants of the earliest formations show that the vegetation of that period consisted of algae and other low forms. These were succeeded by cryptogams, ferns, lycopodiums, and equisetums, and these again by gymnospermous plants, such as conifers, with tree ferns and some few monocotyledons. In the later periods angiosperms made their appearance, commencing with incompletæ, passing to polypetalæ, and leading up to gamopetalous plants, which now prevail. Thus there is sufficient evidence to show that there has been a succession of types of vegetation each somewhat more complex in morphological structure than the preceding type, but we are also led to the conclusion that this succession has not been continuous but has been interrupted in different localities.

As regards the distribution in altitude I may say a few words. It has already been stated that the lofty tropical mountains show a varied vegetation, the

plants found above the limit of eternal snow being representatives of the species found in regions nearer the poles. The surfaces of these mountains are hence divided into regions corresponding to the tropical, temperate, and frigid zones. Meyen has classified them into regions similar to his divisions of the earth's surface into zones.

His region of palms and bananas corresponds to the equatorial zone, the region of tree ferns to the tropical zone. The elevated East Indian forests in the equatorial zone abound in the genus *Ficus*, presenting an appearance of gloomy grandeur and dense vegetation. The region of laurels and myrtles corresponds to the sub-tropical zone, and the region of evergreen trees to the warm-temperate zone. Conifers, representing the sub-arctic zone, occur on most mountains, usually as pines and firs. The vegetation in the region of alpine herbs generally occurs as patches situated on round which lies beneath a mantle of snow during the greater part of the year. Here lichens flourish in abundance, and the plants in general are characterised by their large sized and showy flowers.

The altitude to which the various classes of vegetation attain is also to a great extent determined by local circumstances, as shown by the differences in distribution on mountains in the same one.

A discussion followed, in which the Chairman, Secretary, Messrs. Bastow, Davis, and Brown took part.

A report on materia medica, by Mr. C. J. Taylor, was read by the Secretary in the absence of the author. It embodied notes on the opium trade of Asia Minor, the localisation of nicotine in tobacco, and of fatty and essential oils in plants, the constituents of eucalyptus oils, and the histology of canella bark. The report was followed by a discussion, in which the Chairman, Messrs. Moore, Brown, Bastow, and Walker joined.

The meeting then adjourned.

Reviews and Notices of Books.

THE LONDON CATALOGUE OF BRITISH PLANTS. Edited by FREDERICK J. HANBURY. Part I. Ninth edition. Pp. 50. Price 6d. (George Bell and Sons, London, 1895.)

A new edition of the 'London Catalogue' has for some years been hoped for by British botanists. The vexed questions concerning the priority of names that have exercised systematists during the last few years have left an unsettled feeling amongst those who study plants rather than plant names, which will be to a certain extent calmed by the publication of an authoritative list of the names to be used in future for British plants. Mr. Hanbury has availed himself of the critical knowledge possessed by Mr. B. D. Jackson, the compiler of the 'Index Kewensis'; Mr. J. Britten, the editor of the *Journal of Botany*; Mr. Arthur Bennett; and other well-known botanists.

As regards the critical genera, *Hieracium*, *Rubus*, *Salix*, *Epilobium*, etc., Mr. Hanbury has obtained the assistance of experts in each. The connection of the names of Mr. Arthur Bennett with the *Naiadaceae*, Messrs. Groves with the *Characeae*, Messrs. Linton and Moyle Rogers with the *Rubi*, and that of the Rev. E. Marshall with the genus *Epilobium*, will be sufficient to ensure that the work has been as well done as possible in the present state of our knowledge. In consequence of the lamented death of Dr. Buchanan White, of Perth, last year, the list of *Salices* which he had prepared could not be discussed by the committee that met at Mr. Hanbury's house to settle all details, and an alternative list has been given in the form of an addendum compiled by the Rev. E. Linton. The latter corresponds with the "Exsiccata" of *Salices* that the brothers Linton are issuing. The list differs from that of Dr. Buchanan White chiefly in the parent under which the hybrids are classified. The plan that has been adopted of giving the supposed or proved parents of hybrids is one that gives a better idea of the forms likely to be met with and of the true relationships of the plants, than a mere list of varietal names, and might with advantage have been followed by Mr. Hanbury under the *Hieracia*. In that genus the plants are divided into thirteen groups, containing 106 species and a large number of varieties, amongst which it can hardly be supposed that there are no hybrids. Mr. Hanbury has, however, grown a number of the plants, and he may perhaps have good reason for regarding them as varieties due to climate, soil, and altitude, rather than hybrids. It is in this genus and the *Rubi* that the largest additions have been made.

The number of generic names that have been altered are comparatively few. In the case of these, as well as of the more numerous altered specific names, it would have been merciful on the part of the author towards those who are not so familiar as himself with the changes that have taken place, if he had given in parentheses the name of the plant in the last Catalogue. The tyro or amateur who looks in the ordinary portable floras will be decidedly nonplussed when he endeavours to find a description of such plants as *Fibichia umbellata*, Koel, or *Borretta cantabrica*, O. Kuntze. There is one other suggestion that may be offered for the improvement of the list, and that is that in another edition the generic numbers should be placed in heavy type in the left-hand blank columns, so as to catch the eye easily. At present the heavy type is kept for the numbers of the families, which are not referred to at all in the index, whilst the generic numbers are small, and in an inconspicuous position, although they are given in the index and will be used for reference.

The typographical errors are practically *nil*, but the distribution might possibly bear a further revision. Under *Ranunculus* (*flabellatus*, Desf.), *C. europæus* Wyman (= *R. charophyllus*, Linn, of previous catalogues) the distribution is given only as C., and under *Simethis bicolor* as 1, although the former has been found in Hampshire as well as in Jersey, and the latter in Ireland as well as in Hampshire. Taken as a whole,

however, the new list will be a most welcome addition to botanical libraries, and all students of the British flora must feel indebted to Mr. Hanbury and his coadjutors for what is undoubtedly a labour of love.

L'INDUSTRIE CHIMIQUE. By A. HALLER. Pp. 348, illustrated. Price 5 fr. (Paris: J. B. Baillière et Fils, 19, rue Hauteville, 1895.)

The author of this book is director of the Chemical Institute of the Faculty of Sciences at Nancy, and it is practically a reprint of his report on the Chicago Exposition, which dealt with chemical and pharmaceutical products, etc. Readers will realise how chemical industries have been modified during the last quarter of a century, and also follow with interest the author's comparison and contrast of the outcome of French, German, and English energy. American enterprise is duly acknowledged, and credit given to other countries where due, chemical and pharmaceutical products, colouring matters, essential oils, and perfumery being chiefly dealt with.

Correspondence.

[Letters to the Editor should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.]

RE-STAMPING WEIGHTS.

Sir,—In February last the Inspector of Weights and Measures of this city requested me to send all my weights to his office to be examined, and also served me with a notice that they must be sent once every year for the same purpose. When they were returned he charged me for re-stamping all the weights and for adjusting those which required it. In reading through the Act it did not appear to sanction the charge for re-stamping, besides which, if the grain weights were to be re-stamped once each year it was evident they would soon become useless, thus increasing the working expenses of business by the charge for re-stamping and the loss of the weights, and therefore the inspector's attention was called to these points. But as he maintained the charge was correct, I laid the facts before the Board of Trade, and after some correspondence I was informed that the inspector had been instructed by the local authority to repay me the charge for re-stamping (this has since been done), indicating, I presume, that it is not necessary to re-stamp weights, and that all charges made for so doing can be recovered.

Leeds.

EDWIN YEWDALL.

ELECTION TO THE WELSH GIRLS' SCHOOL.

Sir,—I wish to inform the readers of your valuable Journal that Mary Margaret Lewis has been successful in being elected to the Welsh School at Ashford at the recent election. I wish to take this opportunity of thanking all chemists who have kindly supported this little girl, it being a most deserving case; and especially do I wish to thank our President, the late Vice-President (Alderman W. Gowen Croes), and Mr. Bremridge for all their kindness and most valuable support and influence; also Alderman W. Vaughan Morgan, Mr. O. V. Morgan, Mr. Grose, of Swansea, Mr. Munday, of Cardiff, and Mr. R. L. Whigham, of Brook Street, who have assisted in every possible manner; and, on behalf of the mother, Mrs. Lewis, I must again express my sincere thanks to all who assisted.

Chelsea, S.W.

ISAAC T. LLOYD.

Notes and News.

TESTIMONIAL TO MR. F. W. SHORT.—It is proposed to present Mr. Short with a testimonial on the event of his retirement from his position as demonstrator in the Society's School of Pharmacy, which he has held for the last thirteen years. A committee has been formed for this purpose, and a circular has been sent to all students of the school during the past fourteen years whose addresses could be ascertained. The subscription list will be closed on Wednesday next, the 19th inst., and intending contributors are requested to communicate by that date with Messrs. Eastes and Tickle, the honorary secretaries, 17, Bloomsbury Square, W.C.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The editor of the *BULLETIN OF PHARMACY*, after looking through the last number of this publication, advises all members of the Association to protect their reputations for consistency, good sense, and knowledge of English, by insisting upon the reporter of the discussions being prevented from putting into their mouths "something they never said, never intended to say, and never would say." It is difficult, on this side of the Atlantic, to ascertain how far the implied charge of incompetent reporting is sustained, and the more especially so since it is said to have been decided, presumably from motives of economy, not to send copies of the 'Proceedings' to either foreign or domestic journals of pharmacy. This, if correct, appears but a mean and paltry way of saving, considering that the Association regularly receives free copies of the journals to which the volumes of 'Proceedings' have been formerly sent in exchange, and has also utilised their contents in the preparation of the abstracts published in the latter. Moreover, no formal notice of the change appears to have been sent out to the journals interested, so that the arrangement savours somewhat of obtaining goods under false pretences.

DISINFECTING A WHOLE WATER SYSTEM.—In Sprottan, Germany, the following method of disinfection was resorted to as a last means during the typhus epidemic in 1894:—The whole pipe system was cleaned by means of steam forced through it by a portable boiler. A boiling solution of soda was then pumped through the pipes. For this purpose six tons of soda were thrown into the water reservoir and brought to boiling point by means of steam.

HOUSEHOLD RECIPES.—The *Manchester Evening Guardian* credits the editor of a well-known ladies' paper with telling the following good story at the New Vagabonds' dinner:—One week, casually overlooking the "Answers to Correspondents" column, which was entrusted to a lady journalist, he read the following alarming statement together with the business-like addendum:—"Martha,—The reply given last week was a mistake. You should have used $\frac{1}{2}$ grain of strychnine, not $\frac{1}{2}$ lb. Jays is the best house for mourning."

SYNTHETICAL DRUGS IN THE NEW PHARMACOPŒIA.—The *Therapist* advocates the inclusion of piperazine as a litholytic, phenocoll hydrochloride as an antipyretic, chloral amide as a hypnotic, and formalin as an antiseptic, in the new British Pharmacopœia.

PHARMACEUTICAL INSTITUTE AT BERLIN.—The *Russische Pharm. Zeitschrift* claims to have received reliable information that Professor Dragendorff, late of the University of Dorpat, has received and declined an invitation to occupy a chair in the pharmaceutical institute about to be founded in Berlin. The reason for this decision is said to be the fact that the professor would not, for the present at least, be provided with a separate laboratory and lecture-theatre.

NATURAL HISTORY OF PLANTS.—The publication of Kerner and Oliver's attractive work is now being continued by Messrs. Blackie and Son, who have just sent out part 13. The conclusion of the section on alteration of form in plants, produced by gall-producing insects, is followed by a highly interesting dissertation on the genesis of new forms as a result of crossing, the production and characters of hybrids being fully dealt with. The fascinating problem of the origin of species then presents itself for consideration, and information regarding the genesis of new species and the derivation of existing ones serves as an introduction to the study of various systems of classification. The scheme of classification adopted for the purpose of the work is based on the division of the vegetable kingdom into four main divisions, and in the present part the Myxothallophyta and four of the five classes of the Thallophyta receive attention.

'SCIENCE PROGRESS.'—Professor Marshall Ward contributes the first article in *Science Progress* for June, his subject being the time-worn one of the fixation of free nitrogen by plants. The ratio of the specific heats of gases is discussed by J. W. Capstick, and J. E. S. Moore writes on the protoplastid body and the metaplastid cell, whilst J. W. Rodger concludes his article on progress in physical chemistry during 1894.

COCA WINE OR VIN MARIANI.—The Lyons Pharmaceutical Society has protested against the action of General Duchesne in ordering Vin Mariani for the use of the French soldiers proceeding to Madagascar. It is pointed out that any pharmacist is capable of preparing a coca wine as good as that of M. Mariani, and that, since the general has not found it necessary to specify any particular brands of Bordeaux or Champagne wine for the troops, it is equally undesirable that he should give one maker a monopoly of the supply of coca wine.

HELIUM AND ARGON.—Dr. Brauner (*Chem. News*) considers that the fact of the absorption of helium by aluminium seems to prove its metallic character and confirm the supposition that it is related to hydrogen in the same way that argon is related to nitrogen.

ENLARGEMENT OF THE 'PRACTITIONER.'—In concluding the first volume of the *Practitioner* published under his editorship, Mr. Malcolm Morris speaks of the increasing favour with which the paper has been received, and announces its enlargement by eight pages, which will be devoted to periodical reviews of the progress made in every department of medicine and surgery.

PROPOSED INSTITUTE OF PHOTOGRAPHY.—Referring to the projected municipal institute of photography in London, *Photography* expresses the hope that the establishment may be a good one, under the presidency of a man possessing a good technical education and also a really practical knowledge of all the processes of photography. Neither "a young man, red-hot from one of the universities, who has to pick up his practical knowledge from his own workmen," nor "an expert workman with no training in the sciences, the arts, in philosophy, and in other forms of culture" will do for the position: nor should there be a revival of the system which involves "the formation of an organisation to obtain a high salary for a young man influentially connected, but ostensibly for the public promotion of some form of culture."

ROYAL SOCIETY CONVERSAZIONE.—At the conversazione at Burlington House, on Wednesday night, there were some forty scientific exhibits, but there was little shown that was strikingly novel from a scientific point of view. Colour-photography, infection by flies, detection by finger-prints, and photography of spectra of gases, were perhaps most prominent amongst the subjects illustrated, but a greater attraction was the telephone apparatus by means of which visitors were put in direct communication with Edinburgh and Dublin by means of the new trunk lines.

English News.

MERCHANDISE MARKS ACT.—Thomas Manley, of 11, Queen's Arms Court, Blackfriars, was summoned at the Mansion House on June 7 for an alleged infringement of the Merchandise Marks Act in having sold on May 30 certain sarsaparilla and sulphur tablets to which goods a false trade description was applied; defendant having been seen in Fleet Street with a barrow, attached to which was a large board upon which was written in conspicuous letters, "Hood's Sarsaparilla and Sulphur Tablets," and upon the barrow were a number of small boxes bearing labels. The tablets were alleged to be of a very inferior kind, and the sale of them calculated to do Messrs. Hood and Co., of Snow Hill and Massachusetts, very considerable injury in their business. The firm had recently obtained a conviction against another person for selling tablets, with a similar false trade description, at Bristol. It was held that the defendant had infringed the Act, and a fine of 20s., with costs, was imposed.

ROYAL BOTANIC SOCIETY.—At the gardens of the Royal Botanic Society, on Friday, June 7, Dr. D. Morris delivered the first of two lectures upon the "Romance of Plant Life," with limelight illustrations. Some of the most striking features of the vegetation of the Canary Islands were described, chief amongst

these being the singular dragon trees, which are regarded as the survivals of a very old African flora. It has been suggested by Balfour and others that, as the ice in the Great Ice-age gradually receded northward and the climate got warmer, these plants were driven to higher regions; and hence on the high peaks of Central and South Africa, the Canary Islands, the slopes of Ruwenzori, and the mountains of Abyssinia, the remains were found at the present day of an old African flora which, by climatic changes, had been gradually driven out and replaced by more tropical plants. The study of these and similar plants afforded one of the most interesting problems in botanical science.

FOOD AND DRUGS ACT.—James Pollard, of Pen-silva, St. Ive, was summoned at Callington on June 6, for selling saffron adulterated with $2\frac{1}{2}$ per cent. of grit and vegetable matter. Mr. J. H. Trehan, of Plymouth, for the defence, objected that the certificate of the analyst was informal, in that it omitted to state the component parts of the article received by him for analysis. The Bench upheld the contention and dismissed the case.

ROYAL INSTITUTION.—A General Monthly Meeting of the Members of the Royal Institution was held on the 10th inst., Sir James Crichton-Browne presiding. The following were elected members:—Mr. Benjamin Bennett, Mrs. Henry Burton Buckley, and Mr. William Watson Cheyne, F.R.S. The special thanks of the members were returned to the Right Hon. Lord Playfair for his donation to the fund for the promotion of experimental research at low temperatures.

PLYMOUTH, DEVONPORT, STONEHOUSE, AND DISTRICT CHEMISTS' ASSOCIATION.—At the monthly committee meeting of this Association, held on the 11th inst., the Secretary read Dr. Dunn's report of the chemistry examination, held at the Technical Schools on the 28th ult.: 1st, Mr. Fairweather; 2nd, Mr. Hearder; 3rd, Mr. Sleep. He also drew notice at the exceptional character of Mr. Fairweather's work. It was afterwards decided to have an outing, of which due notice will be given shortly.

Scotch News.

EDINBURGH CHEMISTS' ASSISTANTS' AND APPRENTICES' ASSOCIATION.—The first botanical excursion of the season took place on Wednesday, June 5, when forty-five members assembled at Blackford Hill at 8.30 p.m. The weather was fine and clear and a very successful excursion took place, the company walking over the Blackford Hill and along the banks of the Braik Burn, returning to town by Liberton. Among the plants collected was a fine specimen of the comparatively rare *Lychnis viscaria*. The party was conducted by Mr. J. Rutherford Hill.

REMOVING THE LAND MARKS.—The taking down and rebuilding of the North Bridge, Edinburgh, and the erection of the new buildings for the Waverley Station of the North British Railway Company, will involve the entire removal of the historic house, 52, North Bridge, in which the now extensive business of Duncan, Flockhart and Co. was begun in the early years of the present century. The business at present conducted there is to be removed in July to temporary premises at the head of Waverley Steps, 9, Princes Street. When the alterations are completed, business will be resumed in new premises on the old familiar site at 52, North Bridge.

Irish News.

PHARMACEUTICAL SOCIETY OF IRELAND.—On Wednesday, the 5th instant, the monthly meeting of the Council was held at the Society's House, 67, Lower Mount Street, Dublin, at three o'clock.

The President, Mr. William Hayes, was in the chair, and the other members of the Council present were the Vice-president, Mr. Beggs, and Messrs. Murray, Lyons (Belfast), Ryan, Bernard, and Conyngham.

The President stated that he had received a letter from Mr. Hodgson, who had been honorary treasurer of the Society since its establishment in 1875, resigning that office and also his seat on the Council. Mr. Hodgson's letter stated that as the Society had now a well-furnished house of its own, a well-equipped school, and nearly £1000 invested, he felt that he had done his work.

The Vice-president said the resignation of Mr. Hodgson would be an irreparable loss to the Society, and moved that he be requested to reconsider his resignation.

Mr. Murray seconded the motion, which was unanimously carried.

The President, in putting the motion, spoke strongly of the services Mr. Hodgson had rendered to the Society.

The President said they had all doubtless heard that one of their most active members (Mr. Wells) had sustained a severe injury to one of his eyes through the bursting of a soda-water cylinder.

On the motion of the Vice-president, seconded by Mr. Murray, the Registrar was directed to write to Mr. Wells conveying the deep regret of the Council at the accident which had befallen him.

A letter was read from Mr. Brembridge, Secretary to the Pharmaceutical Society of Great Britain, stating that the request of the Pharmaceutical Society of Ireland that their Preliminary examination should be accepted by the Pharmaceutical Society of England in lieu of the First examination had been referred to the Board of Examiners of the latter Society.

Letters were received from the Local Government Board of Ireland on the subject of a practice existing in certain Poor Law Boards in Ireland of giving contracts for the supply of medicines to grocers. The Local Government Board asked in what unions the practice prevailed, and having been informed, replied that it had already communicated with the guardians on the subject.

A letter was received from Mr. J. M. Whelan, solicitor of Roscommon, who was acting for the Society in prosecutions against two residents of the town for selling poison in sheep dip without being qualified to do so. One of the defendants, Mr. Daniel Walsh, sent a letter of apology, stating that he was not aware that he had been violating the law, and that he had sent back three-fourths of a dozen packages he had ordered.

The Council decided to instruct Mr. Whelan that, on Mr. Walsh apologising in court and paying his proportion of the costs, the summons against him should be withdrawn.

It was ordered that Mr. Alexander Robertson, chemist, of Oban, should be informed, in reply to a letter of his, that the Pharmacy Act (Ireland) applied to patent medicines, but that his question regarding their sale could only be settled by an action at law; and, in reply to his second query, no person save those registered under the Irish Acts could sell in Ireland any scheduled poison.

A letter from the District Inspector of the Royal Irish Constabulary at Ballymoney called attention to a case which occurred there of a child who was poisoned by laudanum sold without a label.

A letter from Mr. James C. McWalter, of Earl Street, Dublin, apprised the Council that in reply to a question put in Parliament by Mr. T. M. Healy, M.P., to the President of the Local Government Board of England, an intimation had been given that, pending a formal reply to be given when Parliament meets, an order would be issued placing members of the Irish Pharmaceutical Society on an equality with members of the Pharmaceutical Society of Great Britain as regards positions as public dispensers in England.

The President said they were very much obliged to Mr. McWalter for the trouble he had taken in the matter.

Other business having been disposed of, the Council adjourned.

PHARMACEUTICAL PROSECUTION.—In the Southern Divisional Police Court, Dublin, on June 6, before Mr. Swift, Mrs. Margaret Fannin and Mr. Richard Booth, trading as Messrs. Fannin and Co., surgical instrument makers and druggists, Grafton Street, were summoned at the suit of the Pharmaceutical Society of Ireland for having on February 12 sold to George A. Phillips a quantity of corrosive sublimate, a poison, contrary to the provisions of the 26th chapter of the 33rd and 34th Victoria, they not being registered as pharmaceutical chemists under the Act.—Mr. R. K. Clay, solicitor (Casey and Clay), appeared for the complainants.—Mr. Campbell, Q.C., appeared for the defendants, and said he admitted the facts as alleged in the summons. He said the house of Fannin and Co. was within the spirit if not within the letter of the Acts. Previous to 1875, and down to 1888, Mr. Fannin carried on business in Grafton Street precisely as it was being carried on at present. At his death he appointed a Mr. Booth and his widow trustees, and directed them to carry on the business until the younger of his two sons came of age, when it should be handed over unconditionally to these two sons. During Mr. Fannin's lifetime and up to the present, a fully qualified surgeon and physician, Dr. Whittaker, acted as manager of the business, with a share of the profits. The Act of 1875 had a proviso preserving the rights of existing chemists and druggists, the only restriction being as to compounding the poisons or medicines, and there was a provision enabling trustees, as in the present case, to continue such business so long as such business was conducted *bona fide* by a duly qualified assistant—a duly qualified assistant within the meaning of the Act being a pharmaceutical chemist, or druggist, registered as such under the Act. So far as the protection and safety of the public were concerned they could not be better safeguarded than they were by the manner in which the business of Messrs. Fannin and Co. was carried on.—Mr. Clay, for the complainants, contended that no one in the establishment was qualified under the Act to sell poisons, and therefore an offence had been committed.—Mr. Swift reserved judgment.

Welsh News.

PRESCRIBING BY A CHEMIST.—On Friday, June 7, the Cardiff coroner opened an inquest on the body of Arthur, the three-year-old son of Frederick Wm. Biggs, of 21, Cairns Street, Cardiff. The evidence of the mother showed that the child had sickened on Friday the 31st ult., when he exhibited symptoms of measles. He was kept indoors, but it was not until Wednesday evening, the 5th inst., that seeing the child's condition was becoming more serious, the father of deceased went to a neighbouring chemist, named Clark, of Coburn Street, and was supplied with a bottle of medicine and some powder. These were administered according to the chemist's directions,

but at half-past four o'clock on the following morning the child died. The doctor called in subsequently would not certify as to the cause of death. The jury failed to agree upon a verdict, and the coroner adjourned the inquest until Saturday, June 8, so that Mr. Clark, the chemist, might be called.—Dr. McCormick then stated that he had made a post-mortem examination of the deceased's body, and found that death was due to acute bronchitis. If medical aid had been obtained some days before death the child, who was exceedingly robust and well-nourished, would have undoubtedly survived; but the chemist's physic had produced no harmful effect.—The coroner then pointed out to the chemist that he might have been in a very disagreeable position if Dr. McCormick had testified that the child's life could have been saved if medical aid had been called in on the previous night. In fact, the jury might then have been of opinion that he was guilty of manslaughter. By his action he had prevented the father from calling the doctor the night before the child died. He was, therefore, exceedingly to blame, as, for the sake of selling his medicine, he had prevented the parents from calling in the doctor.—The jury returned a verdict of "Death from natural causes," and expressed the opinion that the parents of deceased were to blame for not having called in the doctor earlier, and also severely blamed the chemist for prescribing under such conditions.

ABERDARE AS AN ANCIENT HEALTH RESORT.—The *South Wales Daily News* observes that doctors and druggists were unknown at Aberdare in the year 1763, and yet the whole valley had been for a year and a day without a single death having taken place. The first to die the following year was an uncommonly tall man, nicknamed "Shoni Fawr," but it was insinuated that he had dealings with a distant relative, who was an apothecary.

Miscellaneous News.

KENTUCKY PHARMACEUTICAL ASSOCIATION.—The eighteenth annual meeting of the Kentucky Pharmaceutical Association was held at the Mammoth Cave, May 21 to 24. Seventy-five members were in attendance, accompanied by a large number of ladies, making a party of about one hundred and fifty. Twenty-five new members were elected. Dr. H. M. Whelpley, of St. Louis, was present, and was elected a honorary member. A strong resolution endorsing the legislation proposed by the American Pharmaceutical Association, looking to the higher recognition of the pharmacist in our Army and Navy, was offered

by Mr. C. Lewis Diehl, and unanimously adopted. The time for holding the annual meetings was changed to the third Tuesday of June, and it was decided that hereafter the meetings be held at places remote from cities and towns, as best favouring the social and professional intimacy of the members attending. The next meeting will be held either at Grayson or Estill Springs, at the discretion of the Executive Committee. Mr. C. J. Rosenham, of Louisville, was awarded the annual prize of \$10.00 for the best commercial paper—"The Passing of the Apothecary Shop"; Prof. O. C. Dilly won the prize for the best scientific paper—"Alkaloidal Assay." A resolution increasing the annual fee from one to two dollars was tabled. The resolutions adopted at the last meeting of the American Pharmaceutical Association with reference to the requirement of certain qualifications of apothecaries were adopted as a whole. The following officers were elected for ensuing year:—President, Addison Dimmitt, 5th and Walnut Streets, Louisville; Secretary, J. W. Gayle, Frankfort; Treasurer, Charles G. Morris, 28th and Dumesnil Streets, Louisville; Chairman, Executive Committee, O. C. Dilly, 2101, W. Walnut Street, Louisville.

CHARACTERISTICS OF GASES.—The *Electrical Review* reproduces the following figures from the two wall diagrams used by Lord Rayleigh for the purpose of illustration in his recent Friday evening lecture before the Royal Institution, the density of nitrogen under different conditions being represented, whilst the characteristics of gases are given in the accompanying table.

NITROGEN, DENSITY.

Atmospheric Nitrogen.

By hot copper, 1892	2.3103
" iron, 1893	2.3100
By ferrous hydrate, 1894	2.3102
Mean	2.3102

Chemical Nitrogen.

From nitric oxide	2.3001
" nitrous oxide	2.2990
" ammonium nitrite (purified at a red heat)	2.2987
" urea	2.2985
" ammonium nitrite (purified cold)	2.2987
Mean	2.2990

CHARACTERISTICS OF GASES.

Name of the gas.	Freezing pressure.	Critical temperature.	Critical pressure.	Boiling point.	Freezing point.	Density of gas.	Density of liquid gas.
*Hydrogen H ₂ ...	...	{ Below } -220°	atoms.	...	...	1	...
*Nitrogen N ₂ ...	60 mm. Hg	-146°	35	-194°	-214°	14	.885
*Carbonic oxide CO ...	100	-139.5°	35.5	-180°	-207°	14	...
*Argon A ₁ ...	...	-121°	50.6	-187°	-189.6°	19.9	{ about 1.5
†Oxygen O ₂ ...	...	-118.8°	50.8	-182.7°	...	16	1.194
*Nitric oxide NO ...	138	-93.5°	71.2	-153.6°	-167	15	...
*Methane CH ₄ ...	80	-81.8°	54.9	-164	-187.8	8	.415

* Colourless.

† Bluish.

Poisoning Cases and Inquests.

Carbolic Acid.—Effie Wilson, aged 38, died on Tuesday, May 21, at Victoria Terrace, Skirbeck, from the effects of carbolic acid, self-administered. Verdict: "Suicide while of unsound mind."

Morphine.—Martha Esther Enderwick, aged 76, died on Sunday, May 26, at Brighton House, East Dulwich, from the effects of morphine. Verdict: "The cause of death was coma, consequent on a dose of morphine."

Prussic Acid.—Walter Sellers West, aged 29, died on Wednesday, May 29, at 247, Hagley Road, Birmingham, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Opium.—Edward Kippes, aged 62, died on Thursday, May 30, in North-West London Hospital, from the effects of opium self-administered. Verdict: "Suicide while of unsound mind."

Pyrogallie Acid.—Harriet Lily Wheeler, aged 2, died on Monday, May 26, at 2, Nelson Villas, High Park, Ryde, from the effects of pyrogallie acid in solution. Verdict: "Accidental death."

Carbolic Acid.—William Mather, of the firm of William Mather, Limited, Manchester, died on Tuesday morning last from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst temporarily insane."

Prussic Acid.—Reginald Conrad Fraser, aged 32, a medical practitioner, died on Monday, June 3, at 105, St. Leonard's Road, Bromley-by-Bow, from the effects of prussic acid, self-administered. "Suicide by taking poison whilst mentally unhinged through intemperance."

Carbolic Acid.—Tom Littlewood, aged 25, died on Monday, June 3, at Oldham, from the effects of carbolic acid, self-administered. At the inquest held on June 4, the coroner, Dr. G. Thomson, said he thought carbolic acid ought to be put in the schedule, and the sooner it was the better. It seemed to him that of recent years poisoning—either suicidal or accidental—had been getting pretty frequent, and it was quite obvious that there should be some restrictions upon its sale, as was the case with many other poisonous articles. Verdict: "Suicide during a fit of temporary insanity," and the jury added as an expression of opinion "that carbolic acid ought to be scheduled along with other poisons, and ought to be restricted as to sale." The coroner said he should forward their expression of opinion to the Home Secretary.

Benzoline.—Arthur Gordon Winsland, aged 2, died on Wednesday, June 5, at 36, Honeywell Road, Wandsworth Common, from the effects of swallowing benzoline. At the inquest the coroner suggested that bottles in which benzoline was sold should be labelled "Poison." The jury agreed with the suggestion. Verdict: "Accidental poisoning."

Laudanum.—George Bayliss, aged 49, died on Thursday, May 30, at Birmingham, from the effects of laudanum, self-administered. Verdict: "Committed suicide while of unsound mind."

Spirit of Ammonia.—George Webb, aged 70, died on Friday, June 7, at Plumstead, from the effects of spirit of ammonia taken in mistake for his medicine. Verdict: "Accidental Poisoning."

Patent Office Business.

APPLICATION FOR PATENT ABANDONED.

No. 12,198.—June, 1894—Greer—Medicinal compound for cure of gonorrhoea.

APPLICATIONS FOR PATENTS.

[From the *Illustrated Official Journal (Patents)*.]

No. 9867.—Improvements in surgical syringes. May 18.

No. 9923.—Improvements in apparatus for mixing and (or) delivering liquids in measured quantities. May 20.

No. 9934.—Improvements in apparatus or appliances for washing or rinsing bottles and other similar vessels. May 20.

No. 10,069.—Improvements in apparatus for aerating liquids. May 21.

No. 10,091.—A mixture or ointment for external and internal application. May 22.

No. 10,098.—An improved dish or tray for the development of photographic films. May 22.

No. 10,121.—Improvements in apparatus for use in opening or closing screw-stoppered bottles. May 22.

No. 10,161.—Improvements in machines for perforating or slitting medical plasters. May 22.

PATENTS PUBLISHED MAY 25.

Hot-water bottle (Gray, C. H.).—The ordinary indiarubber hot-water bottle is fitted with an air-vent by which air may escape while water is poured in, without causing splashing of the water. The vent may be formed by a tube having an independent screw cap, or may be so formed as to be closed by the cap which closes the mouth of the bottle. No. 8817 of 1894.

Alkaline cyanides (Imray, O., communicated by Goerlich and Wichmann).—The cyanide of potassium or sodium is prepared by heating a mixture of the powdered brittle alloy of lead and potassium or sodium, which is now made commercially, with dried potassium or sodium ferro-cyanide. The action results in a mixture of lead, iron and the fused cyanide, which is removed by lixiviation. A cyanide containing both potassium and sodium may be similarly prepared. No. 8889 of 1894.

Cyanides, Making and Purifying (Crowther, H. W. Rossiter, E. C. and Albright, G. S.).—For preparing alkaline cyanides the inventors fuse the corresponding ferrocyanide with metallic zinc, whereby a mixture of metallic iron and the cyanides of zinc and of the alkali-metal, is produced. The resultant mass is treated with sufficient carbonate or sulphide of the alkali to precipitate the whole of the zinc, and after fusion and cooling it is lixiviated to remove the pure alkaline cyanide. For purifying alkaline cyanides containing sulphides, they are fused with cyanide of zinc or with the double cyanide of zinc and potassium or sodium. The sulphur is thus removed as sulphide of zinc which is left on dissolving out the purified alkaline cyanide with water. No. 9275 of 1894.

Thermometer case (Jones, E., Dring, and Fage).—The case is formed with a rounded and wedge-shaped top, having a handle formed by two bent wires, which constitute a spring clip. The hinged cover of the case may be arranged to be kept closed by the handle. The case is intended especially for thermometers used in breweries and manufactories. No. 9694 of 1894.

Sterilising Milk (Hawksley, T. B.).—For preparing milk for infants and invalids, the inventor employs a vessel fitted with a thermometer and suited for use with an ordinary fire. This vessel is charged with water, and a closed bottle containing the milk is placed within it upon a perforated plate a short

distance above the bottom of the vessel. After heating for a stated time to a temperature not exceeding 155° F., the treatment is finished. As the lower stratum of milk thus treated is said to be of less nutritive value, a syphon tube is provided for withdrawing it. No. 9765 of 1894.

Artificial musk (Abel, C. D., communicated from the Fabriques des Produits Chimiques de Thann et Mulhouse).—Refers to improvements in patents No. 4963 of 1849, and 15,687 of 1890, and relates to the production of tri-nitro derivatives of hydrindene and corresponding aromatic hydrocarbons, whose graphic formulae are represented with closed lateral chains. These bodies have a musk-like odour. The inventors prefer to prepare the butyl, propyl or amyl-hydrindene by the method of Friedel and Craft, or by other means; to convert this into the di-nitro derivative, and after purifying the latter, to convert it into the tri-nitro compound. The method of preparation is described, but is too lengthy for abstraction. No. 12,980 of 1894.

Soluble double phosphates (Raspe, C.).—Soluble double phosphates of the alkali metals with tin, copper, zinc, antimony, bismuth, etc., are prepared by fusing together stated proportions of the alkaline phosphate, phosphoric anhydride and the oxide of tin or other of the above metals. The specification describes the quantities and methods of treatment to be used for preparing each compound for use in medicine, dyeing, electro-metallurgy, etc. No. 13,199 of 1894.

Tooth-brush (The Will and Finck Co. and Frederick, M.).—Relates to a tooth-brush having a slot in the handle in which fits a binged or other blade "for scraping or cleaning the tongue." No. 13,341 of 1894.

Alcohol (Zdarck, R.).—Comprises the production of alcohol by first converting cellulose, lignin (or wood-starch), etc., into sugar and then fermenting it. The conversion into sugar may be effected by "inversion" with stated proportions of sulphuric and nitric acids under pressure and in a stated manner. A small quantity of calcium superphosphate is preferably added. After fermentation with yeast or the "ferments of vegetable juices," the alcohol is distilled off as usual. No. 13,492 of 1894.

Combs (Hinde, W. B.).—The ends of the metallic teeth of combs are formed with a small spherical enlargement, which prevents injury to the skin, but does not interfere with passage through the hair. No. 2980 of 1895.

Lotion (Raymond, R.).—A lotion for the treatment of eczema, scrofula, blotches, and other skin diseases, is prepared by mixing in a stated manner, and in stated proportions, bismuth carbonate, zinc oxide, glycerin, hydrocyanic acid and water. No. 4327 of 1895.

Deodorising fats and oils (Filbert, J. H.).—The oils or fats are contained within a vessel provided with a hot water jacket, and while heated, are subjected to the action of an air-blast which eliminates and carries away the ill-smelling gases in the oil or fat. Arrangements of paddle agitators and scrapers for promoting the action are described. No. 5197 of 1895.

Powder for the skin (Hughes, G., communicated from Vitalis, S. M.).—A powder for application to the feet and other parts to relieve soreness from perspiration, etc., is composed of stated portions of calcined alum, potassium permanganate, and henna. No. 5923 of 1895.

Chair for dentists (Mann, W. B., and Stilwell, W. T.).—Relates to an arm-chair for dental use readily adjustable by the operator. The chair is fixed upon a cylinder provided with arrangements by which the chair may be raised or lowered by means of a liquid column controlled by a pump operated by a treadle. No. 6730 of 1895.

Trade Marks Applied For.

[From the Trade Marks Journal.]

No. 186,770.—CHEMICAL SUBSTANCES used in manufactures, photography, or philosophical research, and anti-corrosives.—Jones Brothers and Company, 12, York Street, Manchester. April 4, 1895. Word: "Selvyt."

No. 186,013.—MEDICATED LOZENGES for human use.—Wyleys, Limited, 6, Wheatley Street, Coventry. March 6, 1895. Word: "Tropels."

No. 186,305.—LINSEED specially prepared for making poultices (for human use).—Chamberlain, Pole and Company, 6 and 7, Broadmead and Union Street, Bristol. March 19, 1895. Device: Two crossed clubs of fantastical shape in a design.

No. 186,772.—CHEMICAL SUBSTANCES prepared for use in medicine and pharmacy.—Jones Brothers and Company, 12, York Street, Manchester. April 4, 1895. Word: "Selvyt."

No. 187,285.—A MEDICINE for human use.—James Lanfear Tilton, 100, Columbia Heights, Brooklyn, U.S.A. April 29, 1895. Device: A Sea-dragon, and the words "Sea Wax." The essential particular is the device.

No. 186,774.—INSTRUMENTS, APPARATUS, and contrivances (not medicated) for surgical or curative purposes, or in relation to the health of men or animals.—Jones Brothers and Company, 12, York Street, Manchester. April 4, 1895. Word: "Selvyt."

No. 187,010.—ABDOMINAL SUPPORTERS, nipple shields, pessaries, trusses, and other apparatus and contrivances (not medicated) for surgical or curative purposes. The Publishing, Advertising, and Trading Syndicate, Limited, 40, King Street, Cheapside, London, E.C. April 11, 1895. Word: "Pegamoid."

No. 184,214.—A DISINFECTANT.—Hardwick's "Purine" Co., 61, Mark Lane, E.C., December 11, 1894. Device: A signet ring with the words "Universal Purine." The essential particular is the device.

No. 186,925.—CHEMICAL SUBSTANCES prepared for use in medicine and pharmacy, but not including preparations for the blood, and not including any goods of a like kind to preparations for the blood.—Mary Anne Hicks, 120, Ball's Pond Road, Islington, London. April 8, 1895. Word "Oona."

No. 187,155.—MALT EXTRACT for use as food.—Johnson's Saccharum Company, Limited, Carpenter's Road, Stratford, Essex. April 22, 1895. Device of a malt kiln, etc., and the words "Treble Malt Extract," etc. The essential particular is the device.

Formulae for Beverages.*

The following collection of formulae for soda-water syrups and other preparations for use at the fountain has been compiled from back numbers of the "Report" and from current literature:—

<i>Ambrosia Syrup.</i>	
Raspberry syrup	8 vols.
Vanilla syrup	8 vols.
Hock wine	1 vol.
<i>Amyosee.</i>	
Shaved ice	1 tumblerful
Raspberry juice	1 fluid ounce
Orange syrup	2 fluid ounces
Juice of half an orange.	

Shake well, add soda-water, and before serving add a small thin slice of orange or pineapple. Serve with two straws in 14-ounce tumbler.

*From *Merck's Market Report*

Banana Syrup.

Put the fruit in slices and place them in a jar; sprinkle with sugar, and cover the jar, which is then enveloped in straw and placed in cold water, and the latter is heated to the boiling point. The jar is then removed, allowed to cool, and the juice is poured into bottles.

Banana Cream.

Shaved ice..... $\frac{1}{2}$ tumblerful
Banana syrup 2 fluid ounces
Cream 8 fluid ounces
Shake well, add a few small pieces of banana, and fill with soda-water, using the fine stream, and serve in a 12-ounce tumbler with a spoon and straw.

Charlotte Russe.

Shaved ice..... $\frac{1}{2}$ tumblerful
Vanilla syrup 1 fluid ounce
Cream..... 6 fluid ounces
One egg.
Shake well and fill with soda-water, using the fine stream. Serve in a 14-ounce tumbler with a spoon; it will have a head like a Charlotte Russe.

Chocolate Syrup.

1.—Best chocolate..... 1 pound
Hot water 1 gallon
Cornstarch 3 ounces
Granulated sugar 7 pounds
Dissolve the chocolate in the water, using great care not to scorch it. Mix the cornstarch with a little cold water, add it to the chocolate, and boil over a slow fire, stirring constantly; strain through a sieve, to remove the coarser particles; dissolve the sugar while the liquid is yet hot.

Or:

2.—Soluble powdered chocolate $\frac{1}{2}$ pound
White sugar $8\frac{1}{2}$ pounds
Hot water 2 $\frac{1}{2}$ quarts
Thoroughly dissolve the chocolate in the water, add the sugar, and bring the mixture to boiling; strain while hot. After it has become cool, vanilla may be added, if desired.

Clam-juice Shake.

Clam juice 1 $\frac{1}{2}$ fl. oz.
Milk 2 fl. oz.
Soda-water 5 fl. oz.
Add a pinch of salt and a little white pepper to each glass; shake well.

Chocolate-Cream Syrup.

The following formula is recommended by F. B. Hays as producing satisfactory results in every respect:

Confectioners' chocolate $\frac{1}{2}$ lb.
Boiling water 2 qts.
Condensed milk 1 can
Granulated sugar 5 lbs.
Extract vanilla 1 fl. oz.
Gum foam 1 fl. oz.
White of two eggs.

Put the chocolate fine, place it in an evaporating dish, and triturate with the water, gradually added, until a smooth paste is obtained; then stir in the milk and sugar, and when the latter is dissolved set aside to cool. When cold, skim off any particles of grease, etc., which may have risen to the top, add the white of egg previously well-beaten, the extract of vanilla, and the gum foam, and strain through muslin.

2.—Chocolate..... 4 oz.
Cocoa (Dutch) 2 oz.
Water 11 fl. oz.
Mix and add:
Condensed milk (Eagle brand) 1 can
Boric acid..... 2 drs.
Foam Syrup ($\frac{1}{2}$ oz. gelatin to 1 gal.)
Stir well; boil one minute, and use without straining.
(To be continued.)

Commercial Notes.

MUSK.

BY P. L. SIMMONDS, F.L.S.

The odour of musk is very widely diffused in Nature, both in the vegetable and animal kingdoms. Of the former may be instanced the common musk plant (*Mimulus moschatus*, Dougl.) and the seeds of *Abelmoschus moschatus*, Medil, *Hibiscus moschatus*, Lin., which are employed by the French under the name of ambrette as a substitute for animal musk. In the animal kingdom there are several pervaded with the musky odour among insects, quadrupeds and reptiles; but for commercial purposes musk is solely obtained from the male of the musk deer (*Moschus moschiferus*).

Unfortunately, we are only able to trace the extent of the trade through the Indian and Chinese trade returns; for nearly a quarter of a century musk has been obliterated from our official imports. All we know is that in 1858 our imports were 10,957 ounces, valued at £11,733; and in 1868 19,753 ounces, of the value of £27,700. The two following years, of which we have official records, were:—

1869.....	23,477 ounces.....	value £23,571
1870.....	21,456 „	„ 24,555

This strong perfume is in demand all over the world. The Chinese have known it for many ages; bordering as their empire does on Thibet and Siberia. They call it *che-kiang*, “che” being the name of the animal, and “kiang,” meaning perfume.

The musk-deer lives in Thibet, Yunnan, Sze-tchuan, and more sparsely in Pielschi-li, or Ohili, N. China. Manchouria also furnishes it. The principal depôt of the musk trade is the city of Tachien-lu in about 30° N. lat., west of the province of Sza-chwan. Thibet and Annam are the principal musk-producing districts. Silungchan, in Kwangai, and Wutingohan, in Yunnan, are probably the chief markets for the musk shipped from Canton.

Mr. R. Lydiker contributed a paper to the *Journal of the Royal Asiatic Society* of Bengal, in 1880, stating that the musk deer there was of common occurrence, and probably extended north of that district in most of the open countries up to Thibet, and thence across or round the Gobi desert into Siberia. There are two commercial kinds of musk, the Tonquin or Thibet received chiefly from China, and the Cabardine or Siberian from India. As the interior or Indian consumption is not taken into account, probably 20,000 deer are actually killed, male and female. In some adult males the pod will contain over 2 ounces, but an ounce may be taken as the usual average. Many of the deer killed when young will only average, all round, half an ounce. In most of the hill States of India, the musk deer is considered a royal property, and the Rajahs keep men purposely to hunt it. The Tonquin musk has been as high as 119s. an ounce, and as low as 45s. It now ranges from 90s. to 95s. the ounce.

The best, as we have seen, is the Tonquin pod; the next in quality is collected in Assam. The values of the imports by land from Thibet into India has been in the last five financial years (taking the rupee at the nominal value of 2s.) as follows:—

1890	£524
1891	1609
1892	3784
1893	1849
1894	334

The exports from India have been as follows in the financial years ending March.

England.....	Ounces.
1876	5267
1877	5020

England.	Ounces.
1878	3115
1879	3444
1880	3224
1881	4080
1882	2756
1883	8452
1884	5864
1885	5759
1886	3816
1887	4656
1888	2144
1889	4934
1890	7208
1891	3284
1892	4113
1893	1514
1894	1031
1895	1156

As the total exports since 1880 have been nearly 64,000 ounces, and averaging one ounce to each animal, over 4000 deer must have been killed annually to meet the demand for export, exclusive of any local consumption. A little musk is sent to Persia, but at least one-third comes to England.

The exports of musk from India to the United Kingdom were in each of the financial years ending March:—

	Ounces.
1888	1828
1889	4574
1890	6438
1891	2630
1892	2678
1893	897
1894	834

The cabardine musk, which is inferior to the Tonquin, is believed to be obtained from a species of the musk deer, called "kubaya," probably *Moschus Sibericus*.

Although China furnishes the largest quantity of musk to Europe, a good deal is used locally. Cabardine musk fetches only 8s. to 10s. in the pod, while the market price for Tonquin, in the pod, is worth from 77s. to 80s. the ounce here. There is little or no demand for grain musk, which is that principally received from India. Cabardine grain used to fetch 60s. the ounce and Tonquin grain 150s.

The appended table gives the export from China; and, judging by these figures, the slaughter of deer in the thirteen years since 1881 must have amounted to at least 700,000 (males and females), because the hunter cannot always identify a male deer.

The exports of musk from China are stated in their returns in piculs (133½ lb.) and catties (1½ lb., avoirdupois), but for the sake of uniformity they are reduced into ounces.

Exports of musk from China:—

	Ounces
1867	17,683
1877	36,793
1881	39,942
1882	43,070
1883	54,391
1884	44,751
1885	42,347
1886	46,198
1887	48,305
1888	58,520
1889	60,179
1890	36,261
1891	55,051
1892	47,667
1893	56,030
1894	56,000

New Remedies.

[The notes given under this heading, for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

BORISM, OR THE TOXIC EFFECT OF BORAX.—Féré, after trying borax in epilepsy for six years, finds it far inferior to bromide of potassium, and far more toxic. Gowers also has noticed diarrhoea nausea and skin affections following its use. In France the unfavourable opinion of the salts of borax has been strengthened, the effect on the skin being widely confirmed (*Therap. Gazette* [3], xl., 261, after *Sém. Méd.*).

[In the widespread use of boric acid and its salts in this country as food preservatives this note is suggestive.]

SODIUM SULPHOCARBOLATE IN PRURITUS.—Local application of the following ointment allays itching in pruritus:—Sodium sulphocarbolate, 5 to 10 parts; vaselin and lanolin, of each 45 parts (*Rev. de Thérap.*).

APPLICATION OF COAL TAR IN ECZEMA, ETC.—Leistikow applies a solution of coal tar in eczema, proriasis, and prurigo, made thus: Coal tar, 3 parts; alcohol, 95 per cent. by vol., 2 parts; ether, 1 part (*Therap. Monats.*, April, 1895).

TREATMENT OF ITCH.—Bourguignon's application for use after a thorough cleansing of the skin by bathing consists of oils of lavender, peppermint, cinnamon, and cassia, of each 3 parts; gum tragacanth, 10 parts; potass. carbonate, 70 parts; flowers of sulphur, 200 parts; glycerin, 400 parts. Where the skin is irritated, as in eczema, etc., or when particularly irritable, as in the case of the very young or in the aged, non-irritant ointments, such as the following, should be used:—Ointment of storax, 20 parts; olive oil, 10 to 30 parts; balsam of Peru, 1 to 3 parts. Or else beta-naphthol, 5 to 15 parts; ether, sufficient to dissolve; menthol, 1 part; vaselin, 100 parts; or, lastly, lard, 100 parts; soft soap, 50 parts; naphthol, 15 parts; powdered prepared chalk, 15 parts (*Rev. Intern. de Méd. et de Chir.*, 1895, p. 163).

ASAPROL IN INFANTILE DISEASES.—Dr. Moncorvo after an extended trial of asaprol in various affections of childhood, arrives at the conclusion that it is a very useful and successful remedy. Administered to healthy children in various doses asaprol is without influence on the temperature, respiration, or digestion. In acute infectious cases, however, it lowers the temperature and pulse-rate, and generally increases the urinary secretion. It also exerts an analgesic effect and besides being antipyretic and antiseptic, it may also be used locally as a hæmostatic administered to children ranging in age from ten days to twelve years, in doses of from 25 centigrammes to 3 grammes per diem; it provokes neither headache, tinnitus, giddiness, nor sickness. The taste at first slightly bitter, then passing to sweet, renders it easy of exhibition to young subjects (*Bull. Gen. de Thérap.*, cxxviii, p. 368).

FLUORIDE OF SODIUM IN TUBERCULOSIS.—Bourgeois states that by administering fluoride of sodium in doses commencing with ¼ milligramme to 5 milligrammes a day, he has effected a cure in nine cases of well-established tuberculosis. The dose cited is small, for as much as ½ to 2 grammes may be given daily (*Bull. Gen. de Thérap.*, cxxviii., 373).

TO AVOID IODISM.—Hardaway claims that the continued use of the following mixture does not produce iodism:—Potassium iodide, $\frac{1}{2}$ to 1 ounce; ammonio citrate of iron, 2 drachms; tinc. nux vomica, 2 drachms; water, $1\frac{1}{2}$ fluid ounce; compound tinct. cinchona, 2 fluid ounces. One teaspoonful in water after meals (*Med. Week.*).

HYPODERMIC INJECTION OF CAFFEINE.—Caffeine is best given hypodermically; it is painless and produces no cutaneous eruption. The following is a convenient form for administering the alkaloid Caffeine, 2 parts; benzoate of sodium, 2 parts; distilled water, 8 parts. Every gramme of this solution contains 25 centigrammes of caffeine (*Amer. Medical-Surgical Bull.*, 1895, No. 8, p. 469).

QUININE AND IPECAC. IN DYSENTERY.—The following combination has been used in the Mandoli Regiment at Bhurtpore in many cases of acute dysentery. It is said never to fail:—Sulphate of quinine, 2 grains; powdered ipecac., 5 grains; ammon. chloride, 10 grains; tinct. opium, 12 grains; water, to 1 ounce. To be given every four hours (*Practitioner*, May, 1895.).

VALERIANATE OF AMYL IN HEPATIC COLIC.—According to Blanc, amyl-valerianate is capable of dissolving cholesterol, and is suggested as a remedy in obstruction of the gall duct by cholesterolin calculi. In general, the preparation acts like ether, in cases of gall-stone colic it produces a sedative and stimulating effect on the liver, as it not only ameliorates the attack but prevents a recurrence of the disease. Irritable stomachs should first be treated with a few drops of sulphuric ether, then two to three gelatin capsules (containing 0.15 gramme of amyl valerianate each) are given; these are repeated every half hour until the crisis is past. During the following days the preparation should be given at greater intervals. In nephritic colic the remedy acts merely as a stimulant, and relieves the cramp-like pains, while it does not affect the gravel. Three drops are given in capsules with a similar quantity of ether, two capsules being given every half hour or six capsules per diem (*Journ. Pharm. f. Els. Lothr.*, 1895, p. 155).

TREATMENT OF GALL STONES BY LARGE DOSES OF OLIVE OIL.—Dr. Stephenson cites a case of urgent hepatic obstruction, in which, while waiting for the patient to be received into a hospital for surgical treatment, he decided as a last resource to try the effect of large doses of olive oil. A 3-grain blue pill was given at bed-time, followed by 3 fluid ounces of pure olive oil, the patient being directed to lie on the right side. The next morning the pill acted, but no gall stones were passed, so the oil was continued in tablespoonful doses every three hours during the day. In three motions, which were passed between 8 and 8 p.m., six large gall stones were found, two measuring nearly half an inch in circumference, and faceted. No pain was experienced during the passage of the stones, nor did the oil occasion much nausea (*B.M.J.*, 1895, 1144).

TREATMENT OF LEAD COLIC WITH LARGE DOSES OF OLIVE OIL.—Two things are essential to the successful treatment of lead colic, clearing of the rectum and allaying pains. According to F. Combernab, both these effects are produced by giving large doses of olive oil. The oil is taken in one dose of 60 to 200 grammes; sometimes it is well to render the stomach anæsthetic by means of cocaine menthol, in order to ensure toleration of the oil (*Apoth. Zeit.*, x., 308).

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

REDUCED IRON.

[884.] This preparation, according to G. Fleury (*Bull. de pharm. de Bordeaux*), should be carefully examined by pharmacists, since he finds that the commercial article is rarely of good quality. A specimen recently examined by him contained only traces of metallic iron, the rest being ferrous-ferri oxide, and silica. When macerated with fifteen times its weight of 1 per cent. hydrochloric acid, only 0.05 per cent was dissolved.

SANDAL WOOD OIL.

[885.] This oil is commonly adulterated with cedar wood oil, but Fearmain and Moor find that sandal wood oil capsules sometimes contain castor oil and an unsaponifiable oil not yet identified. A paper on the subject was recently read before the Society of Public Analysts, and will, presumably, be published in full in the *Analyst*.

PRESERVATION OF POWDERED ERGOT.

[886.] Ergot may be preserved indefinitely in the state of powder, according to Bertini (*Boll. Chim. Pharm.*), by first coarsely powdering, then macerating for eight days with three times its weight of petroleum ether and shaking frequently, and finally drying and reducing to fine powder. The ether is said not to dissolve any of the active principles of the ergot, but removes all the fatty matter. The *Moniteur de la Pharmacie*, however, remarks that the process is not new, and expresses doubt as to its effectiveness and the correctness of the statements made regarding it.

EXTEMPORANEOUS STERILISATION OF COTTON-WOOL.

[887.] Lermoyer and Helm (*Presse Médicale*) sterilise absorbent cotton-wool extemporaneously by soaking it in a saturated alcoholic solution of boric acid, and then igniting. The cotton is said to be sterilised by the heat, whilst the acid prevents carbonisation. Five seconds suffices, and as soon as the flame assumes a bright green colour it is extinguished. The wool remains white and dry, and it is stated that culture experiments have proved the completeness of the sterilisation.

HYPODERMIC INJECTIONS OF QUININE.

[888.] The best salt for these injections, according to Kelsch (*Arch. de méd. et de pharm. militaire*), is the basic hydrochlorate of quinine. This is rendered more soluble by the addition of analgesine, the solution being prepared by dissolving quinine hydrochlorate, 8 Gm., and analgesine, 2 Gm., in distilled water, 6 Gm., and thus containing 50 per cent. of the quinine salt. The solution should be freshly prepared.

CASEIN OINTMENT.

[889.] The formula of Belersdorf, of Hamburg, for this ointment is as follows (*Ann. de Pharm.*):—Dried casein, 14.0 Gm.; caustic alkali (containing 4 per cent. potash or 1 per cent. soda), 0.43 Gm.; glycerin, 7.0 Gm.; yellow vaselin, 21.0 Gm.; zinc oxide, 0.5 Gm.; carbolic acid, 0.5 Gm.; water, *q.s.*, to make 100.0 Gm. This ointment is stable and homogeneous, and serves as the vehicle for any medicament. When spread upon the skin it thickens and dries rapidly, forming an adherent pellicle.

SODA-WATER FOR BURNS.

[890.] Numerous remedies for trifling burns have been suggested; a novel one is that proposed by Gowlowsky (*Pk. Central.*), who recommends a stream of soda-water from an ordinary syphon to be projected on to the burnt surface.

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C., ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

* * * Queries should be addressed "Editor," and will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTERS.

CO-OPERATION AGAINST CUTTING.

MR. GEO. P. POND, 68, Fleet Street, E.C., says:—"Co-operation is perhaps the most powerful means to combat 'cutting'—the dreadful scourge of the trade. But I think it would have to be on a more comprehensive scale than that suggested in the Journals for last week by Messrs. Elliman and Co. 'Three or more manufacturers whose sales are large' will most certainly be very insufficient. No co-operation can be successful unless the trade as a whole, wholesale and retail, join in one body and agree together. It is quite natural for 'those whose sales are large' to make terms agreeable to themselves, but which might be objectionable to the retailer. The man who sells retail must have a voice in the matter with the house that sells wholesale. If the kind of protection which is now adopted by Messrs. Elliman and Co. and a few others is to be extended by its adoption by others whose sales are large, I should very much object to it as lessening my retail profit. I also think that fixing a 'minimum price' is not a good way at all, for the reason that it has the tendency everywhere to fix the article at that price, and make it more difficult to get the full price, say 1s. 1½d. The next point is Messrs. Elliman's suggestions I fear will not work, viz., 'The indirect buyer who cuts would be dealt with in a manner to be agreed upon, which need not be made public.' No secret can work for good, and whatever the secret, in business it would soon become known to every one, and be no longer a secret. Co-operation is the idea which should not be lost sight of, and if Messrs. Elliman, with some other large houses, would join issue and start a scheme by which the whole trade could join in one trade union, a power would be formed which would soon cut out the cutter. Messrs. Elliman and Co. say there are indications that the time has arrived for co-operation. Many thanks to Messrs. Elliman for their foresight and action, and for their good intentions in what they have already done; but all will be set unless a united body is got together first."

ANSWERS.

A. W. W.—It is *Euphorbia esula*, and probably a ballast plant.

GEORGE BARKER.—Scheele's green is arsenite of copper, impure varieties of which, containing acetate or carbonate

occasionally, are known under different names, as Brunswick green, Schweinfurth green, emerald green, etc. Paris green is also generally understood to be an impure arsenite of copper, but the colour prepared by Poirrier, Bardsy, and Lauth, under that name, was obtained from anilines by oxidation with bromine, chlorine, iodine, nitric acid, arsenic acid, etc. The compound formed was soluble in alcohol, and soda precipitated it from the solution formed.

H. L. IRONMONGER.—The plants are *Lepidium draba* and *Erigeron philadelphicus*. Where did you find the latter?

WALKER.—Yes, in the note on "Anthion," by a slip of the pen, the word "permanganate" appears in mistake for "persulphate," but the context should render it sufficiently obvious that the latter is meant.

E. F. HARRISON.—All safely to hand, with thanks.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Ball, Barker, Callis, Evans, Gerrard, Harrison, Hill, Kemp, Parker, Reeve, Rideal, Schröder, Shapley, Simmonds, Sutton, Tirard, Tutty, Williams.

Obituary.

TAYLOR.—On May 22, Thomas C. Taylor, Chemist and Druggist, Nottingham. (Aged 48.)

HENDERSON.—On May 24, James B. Henderson, Chemist and Druggist, Dollar, N.B. (Aged 53.)

MELLOR.—On May 25, William Mellor, Chemist and Druggist, late of Great Malvern. (Aged 53.)

CORDLEY.—On May 27, William B. Cordley, Chemist and Druggist, Colchester. (Aged 46.) Mr. Cordley was local secretary for Colchester, and had been an Associate of the Pharmaceutical Society since 1870.

BROWN.—On May 28, Alexander Brown, Chemist and Druggist, Motherwell. (Aged 32.)

HOLMES.—On May 30, George Holmes, Chemist and Druggist, Huddersfield. (Aged 63.)

FURLEY.—On June 3, John Furley, Chemist and Druggist, Poplar. (Aged 77.)

WOODHOUSE.—On June 3, E. A. Woodhouse, Chemist and Druggist, Grimsby. (Aged 52.)

WEBSTER.—On June 7, John Henry Webster, Chemist and Druggist, Scarborough. (Aged 48.)

GUNN.—On June 8, William Gunn, Pharmaceutical Chemist, Duns. (Aged 62.) Mr. Gunn had been a member of the Pharmaceutical Society since 1865. From 1873 to 1888 he served as a Police Commissioner, and during nine of these years he was chief magistrate of the burgh.

Publications Received.

[Publishers are requested to state the price of books sent for review.]

KERNER AND OLIVER'S 'NATURAL HISTORY OF PLANTS.' Part 18. Price 5s. 6d. net. (Blackie and Son, London.) From the Publishers.

THE EYE IN RELATION TO HEALTH. By CHALMER PRENTICE, M.D. (Chicago.) Pp. 214. Price 6s. 6d. (John Wright and Co., Bristol.) From the Publishers.

ON THE RENDERING OF ANIMALS IMMUNE AGAINST THE VENOM OF THE COBRA AND OTHER SERPENTS; and on the Antidotal Properties of the Blood-Serum of Immunised Animals. By PROFESSOR THOMAS R. FRASER, F.R.S. Reprinted from the 'Proceedings' of the Royal Society of Edinburgh. Pp. 16. From the Author.

THE USE OF REPERCOLATION IN OFFICIAL PHARMACY.

BY R. A. ORIPPS, F.I.C.

Since the publication of Dr. Squibb's elaborate researches on repercolation, several pharmacists in this country have advocated its use for the preparation of liquid extracts and some other galenicals, e.g., Inglis Clark (*Ph. J.* [3], vol. xvi., p. 521) especially refers to its value for liquid extracts of ergot and cinchona, and syrup of senna; and Bird, at the last meeting of the British Pharmaceutical Conference, advocated its adoption for liquid extract of coca and podophyllin.

The process is now used by many chemists upon both the large and small scale, and I believe no one who has once given it a fair trial will care to return to the less satisfactory processes entailing evaporation.

I have personally used the method for several years, and it is with the object of urging its official recognition, at least as an alternative process, that I am led to publish the results of my experience. That the details may be more readily available, in case of official recognition, I have described two modifications of the process, and arranged the various liquid extracts, etc., under one or other of these types, with notes in special cases.

TYPE I.

Extractum cascarae sagradae liquidum.

Take of—

Cascara sagrada, in No. 20 powder, 4 lbs.

Rectified spirit, 1 fl. part } a sufficiency.

Distilled water, 3 fl. parts }

Divide the cascara into four equal parts, damp the first portion with 10 fluid ounces of the diluted spirit, allow to stand in a covered vessel for six hours, then pack firmly in a slightly conical percolator, and pour over the contents of the percolator sufficient of the diluted spirit to saturate the powder and leave a shallow stratum above it. When the liquid begins to drop, close the lower orifice, and allow to macerate for twenty-four hours; then continue slow repercolation, adding more menstruum as required, or, preferably, supplying the same automatically. Collect the percolate in fractions of about 10 fluid ounces, and with the first of these damp the second portion of cascara. Allow this to swell, pack, macerate, and percolate exactly as before, but setting aside the first 8 fluid ounces of percolate, and using the next 10 fluid ounces to damp the third portion of cascara. Treat this like the second portion, but add the first 16 fluid ounces of percolate to the former reserved portion. Damp the fourth portion of cascara with the next 10 fluid ounces of percolate, and carry on the percolation as before until 40 fluid ounces have been obtained from the last percolator, which is added to the former reserved portions.

The spirit retained by the cascara may be recovered either by displacement with water or pressure, and should be retained to serve as menstruum for a succeeding batch of liquid extract.

Note.—In this, and also in the case of ext. rhamni frag. liq., repercolation cannot be used as an alternative with the present official process, the products differing greatly in colour, etc.

The following liquid extracts may be prepared upon this type. The third column gives the amount

of menstruum in fluid ounces required to damp 1 lb of the drug, and this number should be read instead of "ten" in above process throughout the directions.

Name of Preparation.	Menstruum parts by measure.	Quantity required to damp 1 lb. of drug.
<i>Extractum cimicifugæ liquidum</i>	Rectified spirit.	8
<i>Extractum cocæ liquidum</i> ..	Proof " "	10
" <i>ergotæ</i> "	Rectified " 1;	
	D. water, 2.....	6
" <i>hamamelidis liquidum</i>	Rectified spirit, 1;	
	D. water, 2.....	10
<i>Extractum hydrastis liquidum</i>	Rectified spirit, 1;	
	D. water, 1.....	8
<i>Extractum jaborandi liquidum</i>	Rectified spirit, 1;	
	D. water, 1.....	10
<i>Extractum nucis vomicæ liquidum</i>	Rectified spirit, 4;	
	D. water, 1.....	6
<i>Extractum rhamni frangulæ liquidum</i>	Rectified spirit, 1;	
	D. water, 3.....	10
<i>Extractum taraxaci liquidum</i>	Rectified spirit, 1;	
	D. water, 2.....	8
<i>Extractum viburni liquidum</i>	Rectified spirit, 2;	
	D. water, 1.....	8

Ext. Cocæ Liq.—A "miscible" preparation of coca is frequently called for, it is very convenient for the production of coca wine. Should it be thought desirable that this should replace the present official liquid extract it may be prepared by repercolation with a weak spirit (1 of a.v.r. to 2 or 3 of water), and subsequent addition of glycerin

Name of Preparation.	Menstruum parts by measure.	Quantity required to damp 1 lb. of drug.
<i>Extractum cannabis indicæ</i>	Rectified spirit	8
<i>Extractum cascarae sagradae</i>	Rectified spirit, 1; distilled water, 1	10
<i>Extractum euonymi siccum</i>	Rectified spirit, 1; distilled water, 1	10
<i>Extractum jaborandi</i>	Proof spirit.....	10
" <i>krameria</i>	Cold water	10
" <i>rhamni frangulæ</i>	Rectified spirit, 1; water, 1....	10
<i>Extractum stramonii</i>	Proof spirit.....	8
<i>Jalapæ resina</i>	Rectified spirit..	6
<i>Podophylli resina</i>	" "	8
<i>Scammonii resina</i>	" "	10
also without evaporation,		
<i>Tinctura ergotæ</i>	Proof spirit.....	6
" <i>zingiberis fortior.</i>	Rectified spirit..	8

Liniment of Aconite may be added to these, the percolation being continued to 96 fluid ounces instead of 64 fluid ounces; also the following extracts, resins, etc., may be advantageously pre-

pared by an adaptation of the process, the resulting liquid being submitted to distillation for recovery of spirit, and the residue evaporated to the required consistence. In this way the exposure to heat is far less, owing to the small proportion of liquid to be evaporated.

Podophylli Resina, Jalapæ Resina, Scammonii Resina.—In the final drying of these resins it is important to keep the temperature low to secure greater uniformity of colour, as pointed out by Brookes; below 100° F. would be desirable.

TYPE II.—In these cases the general process is the same as in Type I., with the exception that no percolate is reserved from the second and third percolators, but the whole of the menstruum is carried through the whole series of percolators. Were it not for the inconveniently thick condition attained by the percolate from most drugs, this would be an advantage in all cases. Percolation is continued till the drug is exhausted, but the percolate is always reserved in fractions, evaporation when needed beginning with the weakest. The extracts, etc., on this type are included in the following table. I have previously described (*Ph. J.*, March 16, 1895) its adaptation to the production of liquid extract of belladonna.

Name of Preparation.	Menstruum parts by measure.	Quantity required to damp 1 lb. of drug.
Extractum belladonnæ liquidum (2 in 1)	Rectified spirit, 7; D. water 1.....	Fl. ozs. 6
Extractum cinchonæ liquidum	Cold water, etc.....	8
Extractum filicis maris.....	Ether	Packed dry
„ gelsemii alcoholium.....	Rectified spirit.....	6 fl. oz.
Extractum glycyrrhizæ	Cold water.....	10 „
„ glycyrrhizæ liquidum	„	10 „
Extractum physostigmatis	Rectified spirit	6 „
„ quassia	Cold water.....	10 „
Oleo-resina cubebæ	Ether	Packed dry

Extractum Cinchonæ Liquidum.—Much difference exists in the commercial samples of this preparation, not only in colour, but also in miscibility with water. Some samples throw out a thick deposit; others give a clear or nearly clear mixture. When made strictly according to the B.P. it will always produce a more or less muddy mixture, and as a consequence, if this process remains official, this variability may be expected to continue, for there will always be some pharmacists who prefer to use the more “elegant” preparations. This being one of those cases in which “elegance” can be attained without sacrifice of medicinal activity, I would advocate the adoption of suitable means for its attainment. For this, two points need attention: first, evaporation must be as much as possible avoided, and when used the temperature must never exceed 180° F.; and second, a portion of the acid and glycerin should be added after con-

centration. I would therefore suggest the following:—

Take of—
Cinchona bark, in No. 40 powder* 2½ lbs.
Hydrochloric acid..... 10 fl. dra.
Glycerin 8 fl. ozs. |

Rectified spirit } Of each a sufficiency.
Distilled water }

Mix half the acid and glycerin with 36 fluid ounces of distilled water, and having divided the cinchona into four equal portions, extract by repercolation as described under liquid extract of belladonna, using distilled water to complete the exhaustion. Reserve the first 30 fluid ounces of percolate and evaporate the remainder at a temperature not exceeding 180° F. (82°·2 C.) till it is reduced to 4 fluid ounces; mix this with the reserved portion, and determine the amount of alkaloids.

After having ascertained the strength, every fluid part of the extract containing 5 grains of alkaloids is brought to the measure of 75 fluid grains by evaporation, or if too strong by dilution with water, then 12½ fluid grains of rectified spirit, and the remainder of the hydrochloric acid and glycerin are added, and, finally, sufficient distilled water to produce 100 fluid grains.

To “characters and tests” should be added “When mixed with twenty times its volume of distilled water a clear, or nearly clear, mixture should result.”

Extractum Glycyrrhizæ, E. Glycyrr. Liquidum, and E. Quassia.—After repercolation with cold water the percolate is raised to the boiling point to coagulate albumin, and completed as usual; in warm weather chloroform water should be employed instead of distilled water, to avoid fermentation, the chloroform being entirely dissipated by the subsequent boiling.

Syrup of Senna.—For the preparation of syrup of senna, I prefer extraction by pressure to repercolation, hence its absence from either of the tables given.

THE STUDY OF MATERIA MEDICA.

(Concluded from page 1119.)

Roots.—Anyone who takes up a piece of German aconite root and compares it with a piece of the Japanese drug will notice at once a difference in the external contour, and on breaking them open transversely he will find other differences, the interior of the German root being usually horny and sometimes hollow, whilst the Japanese has a firm, white, starchy character. He will not be able to make out much of the internal structure so far, but he will have learnt that drugs differ in quality. Further examination will show that some of the hollow pieces have a portion of the base of a stem attached at the top, and must consequently have been gathered during the summer, when the root has lost its store of nutriment; whereas the Japanese shows evidence, in the quantity of starch present, and in the absence of the base of the stem, that it was gathered during the late autumn or spring before the new stem had formed, and after the old one had perished. To see the structure more clearly, the surface of the fracture is shaved

* For larger quantities use bark in No. 30 or 20 powder.

smooth with a sharp penknife, and wetted. The vascular bundles will then come into view as an irregular ring, which is less decidedly angular in the Japanese than in the German aconite. In this case, as in all others in which the structure is indistinct, the sense of taste may be used. It is well, however, always to be cautious in this respect, and to taste not more than a grain, rejecting the material and taking care not to swallow the saliva. In the case of aconite a tingling sensation arises in about two minutes, and continues, accompanied with or followed by a sense of numbness for a couple of hours, which once experienced produces a permanent impression on the memory.

If proof is needed of the presence of starch in the root it is easily obtained by boiling a fragment in a test tube, and adding a drop of tincture of iodine, or by scraping off a particle from the white surface into a drop of water on a microscopic slide, running a drop of solution of iodine under the glass cover, and drawing it through the water by a piece of blotting paper applied to the opposite side of the cover.

Or pieces of pellitory root and of dandelion root may be compared. If the roots are broken across and the structure observed under an ordinary lens, the dandelion root will be seen to have a small yellow porous woody centre or stele, and a thick white cortical portion with concentric horny rings, whilst in the pellitory the woody centre is much larger, is divided into distinct wedge-like portions, and the outer or cortical portion is narrower, with radiating horny lines and small dark dots, indicating the presence of cavities containing oleoresin. On tasting the two roots the dandelion is found to have a sweetish taste, whilst the pellitory soon causes a flow of saliva and has a tingling taste, which, however, is without the persistent numbing sensation produced by aconite. If several pieces of liquorice root are next examined, there will be observed in the centre of the end of some of them a small depression, which on being cut with a sharp knife shows the structure of pith. The apparent root is therefore an underground stem, such pieces being less sweet than the true root in which the pith is absent. In some rhizomes, such as those of *Cimicifuga* or *Helleborus niger*, it is often necessary to break several pieces before a sound specimen showing a firm fracture is met with, and an examination of the rootlets will also afford in some cases characteristic features. In a few like *arnica* and *veratrum*, the diagnostic characters are best seen in longitudinal section.

Barks.—A comparison of the barks of *Rhamnus purshiana* and *Rhamnus frangula* may serve as an illustration. On scratching the outersurface with a penknife, a deep crimson layer is seen underneath the epidermis in *R. frangula*, and the bark is dotted over with whitish lenticels. In *R. purshiana* the bark is thicker and the outer surface shows a much duller and paler red colour when abraded, and the lenticels do not form a prominent feature. On comparing *cusparia* bark with *nux vomica*, the transverse fracture of the former is seen to be of a deep brown colour, and that of the latter of a paler brown. In the former the inner surface is laminated, and can often be separated into thin layers by the nail or a penknife. In the latter the inner surface is firm and not laminated. These two barks are to the naked eye probably more alike than any other

two barks, but anyone who has tasted the two and has noticed the peculiar earthy flavour and almost urinous odour of *cusparia*, and compared it with the persistent pure bitter of the *nux vomica*, without any flavour or odour, would hardly confound them with each other.

In many barks the structure is so dense that it is difficult to see it without the use of a "platyscopic" lens. This will be found especially useful in examining the transverse section of pomegranate bark, or the inner surface of the bark of *Prunus serotina*.

But anyone who will use the senses of sight, taste, smell, and touch, aided by a sharp penknife and a good pocket lens, will have no difficulty in recognising with absolute certainty any crude drug, whether the specimen be half an inch long or a dozen inches.

Any ordinary pocket lens answers well for most purposes, but a "platyscopic" lens, or the one inch objective of a microscope, is much better for revealing minute details, such as hairs, glands, etc.

Leaves.—These should be soaked in hot water to render them pliable, so as to spread them out to show their outline or divisions. The chief differences in leaves are in the outline, the character of the margins, in the mode of division, in the arrangement of the principal veins or nerves, the more or less prominence of them on one side or the other, and in the presence of hairs, glands, or scales.

A good illustration occurs in the leaf of *Digitalis*, in which the lateral veins run down at an acute angle into the broad leafstalk, and the margins are crenulate, whilst in *Inula conyza*, the leaves of which closely resemble it in general appearance, the lateral veins are not decurrent, and the margin of the leaf is serrulate. If a particle of the edge of a leaf of *Digitalis*, *Verbascum thapsus*, *Inula conyza*, and *Matico* be examined under a microscope, it will be seen that the hairs of each also afford characteristic differences.

Two of the leaves which, perhaps, most frequently puzzle students are belladonna and stramonium, since the leaves become broken in drying, and it is then difficult to show that the one has an entire and the other a sinuate dentate leaf. In such cases resort must be had to the platyscopic lens. On viewing a piece of belladonna in an oblique light, minute pale dots will be observed all over the surface of the leaf, but on looking at stramonium in the same way the surface is seen to be minutely wrinkled, and the substance of the leaf appears to be thicker. If, however, the microscope be used, even a small particle half the size of a split pea can at once be identified. If soaked in strong solution of caustic potash (50 p.c.) the leaf becomes transparent, and black dots can be seen under a low power of the microscope ($\frac{1}{4}$ -inch objective). These under a $\frac{1}{4}$ -inch objective are resolved in the case of stramonium into globular masses of pyramidal crystals (sphaeraphides), or in the case of belladonna to sandy crystalline grains completely filling the cell. A solution of three parts of chloral hydrate in two of water answers quite as well or better for clearing the cells, but it requires several hours to produce the same effect. Still more can be learned by cutting a section of the leaf placed between two pieces of pith. It will then be seen that the prominent dots on the bella-

donna are due to the tissues contracting on the cells containing the sandy raphides, whilst the long palisade cells in the stramonium do not permit them to be seen so easily and cause, by the unequal contraction of the two sides of the leaf, the wrinkled appearance noticeable under the platyscopic lens.

In the case of powdered leaves, such as senna, it will be necessary to use some clearing solution, such as liquor potassæ or chloral hydrate, to render the tissues transparent, and then to search under the microscope for the characteristic tissues of the drug, as, for instance, the immersed hairs in the case of senna, and to make sure of the absence of tissues that do not belong to senna, such as the milk cells and rosette raphides found in argel.*

Flowers.—These are best examined after being softened in water in a porcelain crucible over a spirit lamp. They are taken out when soft, the superfluous moisture removed by laying them on a piece of filtering paper, and then placed under an ordinary magnifying glass supported so as to leave the hands free. A pair of glover's needles (which have cutting edges) inserted in firm holders may be used for dissecting the flowers. Only one flower should be examined at a time, freed from the inflorescence. The flower is held firm with the left-hand needle and dissected with the right-hand one, each of the outer segments being first removed so as to show the number and position of the inner ones, or the flower may be slit open from below upwards with the point of a sharp penknife. In such case it will be necessary to take a second flower, preferably one from which the corolla has fallen, to obtain a transverse section of the ovary, and to see the placentation. The use of a mirror below the object enables the operator to see the details better. Anyone with a mechanical turn can easily make a useful dissecting microscope out of a small cigar-box.

Larger flowers can be examined with the platyscopic lens, when the leading characteristics can easily be seen, such as the hairy receptacle in arnica, the scales or the solid conical receptacle in Roman camomile, and the conical hollow receptacle without scales in *Matricaria chamomilla*, the rhomboid bractlets in lavender. In the case of the camomile and clove it is well to make a vertical cut through the flower with a sharp knife before examining it. Saffron needs to be soaked in cold water to reveal if present stamens, ligulate florets, and mineral adulterations. The mineral matter, if insoluble, falls to the bottom of the vessel. Soluble salts which are sometimes used to adulterate it can be obtained on evaporation of the clear liquid. In powdered flowers, such as insect powder, the characteristic papillæ or the ligulate florets† and the glands and hairs characteristic of the flowers must be looked for, an abnormal abundance of the hairs‡ indicating that the foliage has been used as well as the flowers. Mineral matter must be detected by incinerating the flowers and ascertaining if an undue proportion of ash is present.

Fruits and Seeds.—The surface of many fruits affords distinctive characters, as in cumin,

fennel, anise, and hemlock. In others it is necessary to cut transverse sections. This is more easily done in the umbelliferous fruits and in such seeds as colchicum, if they are first soaked for a few days in a mixture of equal parts of glycerin and water. A thin section can then be readily obtained with a sharp penknife, placing the seed or fruit on a piece of soft wood under the tip of the left-hand thumb nail to keep it firm whilst cutting. A much better section can be obtained by the use of pith and a razor. For this purpose take two pieces of pith (obtainable from manufacturing jewellers, that of the sunflower stem or elder answers well), cut one side of each smooth with a sharp knife, and place the object to be cut between the two smooth sides, binding the two pieces of pith firmly together by means of cotton thread. In using the razor, the elbows should be placed firmly against the sides of the body, and the thumb of the hand which holds the pith depressed, lest a slice be taken from it as well as from the pith.

The presence or absence of vittæ or resin cells in umbelliferous fruits is best ascertained in this way. Thus, a section of mature conium fruit shows no vittæ, whilst anise, which resembles it externally, shows about thirty in each half fruit. Coriander has two vittæ on each flat surface, but none on the convex surfaces. In powdered seeds or fruits the special characteristic of structures of each, as given in atlases of pharmacognosy, must be looked for, such as the cells of the endocarp in cubebs and the absence of foreign structures.* Occasionally a colour test is very useful as a preliminary, such as the use of sulphuric acid, which gives a carmine colour with the cubebin present in true cubebs, but absent in the adulterations hitherto employed.

The structure of seeds such as mustard, henbane, stramonium, and fenugreek, etc., may be easily made out by softening them in warm water, and then removing the seed coats, when the presence or absence of albumin around the embryo and the folding of the cotyledons is easily seen. The origin of the "worms" which henbane seeds and hot water draw out of decayed teeth, according to popular belief, will then be easily seen in the form of the curled filiform embryo previously imbedded in the albumin of the seed. Poppy, lobelia, and other seeds show characteristic markings on the external surfaces when seen with a platyscopic lens or a 4-in. objective.

Gums, Resins, Juices, etc.—The gums, gum resins, resins, and juices may be easily distinguished by rubbing their surface with water. If a gum resin contains even a small proportion of gum, as in scammony, it becomes milky, which is not the case with scammony resin. Gum resins also char in a flame instead of melting, and are only partly soluble in alcohol. Gums either swell up or dissolve to form a mucilage with water, and char when heated. Resins and oleoresins melt and burn readily when heated, a few, however, only swelling up before burning.

Attention may here, however, be directed to the colour tests for aloes. A fragment of true socotrine aloes touched with nitric acid gives a brown colour, but spurious socotrine gives a bright crimson coloration. The colour of the powder of aloes differs much according to the kind and the quality, and may be used as a test of either.

* Vogl, 'Anatomischer Atlas,' taf. 20-21; Moeller, 'Pharmacognostischer Atlas,' tab. xxi.

† Moeller, 'Pharmacognostischer Atlas' tab. xl.

‡ Pharm. Journ. [3], xix., p. 240.

* Pharm. Journ. [3], xxv., pp. 314, 757, 767.

The more or less crystalline character of dried juices as seen under the microscope will often afford valuable tests, as in the case of balsam of tolu. In the case of powdered gum, the microscope is also useful in detecting the presence of starch.

Dried juices, like all other plant products, differ in taste, odour or solubility in alcohol and water, and appropriate tests for most of them may be found in text-books on materia medica.

For the study of the macroscopical appearance of drugs, Maisch's 'Manual of Materia Medica' (Trübner) offers useful illustrations. For the microscopical, Vogl's 'Anatomischer Atlas der Pharmacognosie' (Urban and Schwarzenberg, Vienna) is of great value.

THE APPROACHING REVISION OF THE BRITISH PHARMACOPOEIA.

THE WEIGHTS AND MEASURES OF THE BRITISH PHARMACOPOEIA.*

BY WILLIAM KIRKBY.

THE BEGINNING OF THE CONFUSION.

It is now over thirty years since the first edition of the British Pharmacopoeia was published, in which the imperial pound and ounce were made official for the compounding of medicines. Previous to that time it was customary to use the apothecaries' ounce for this purpose. As the latter contained 480 standard grains and the former 437.5, the change was not only a very considerable one, but a very confusing one, because the imperial ounce cannot be divided into aliquot parts containing an integral number of grains. In consequence of this difficulty the editors recommended that prescribers and dispensers should discontinue the use of the drachm and scruple—in other words, that all quantities less than an ounce should be expressed in grains. Imperial measures were likewise adopted for denominations of one ounce and upwards, but for lesser denominations the old apothecaries' measures were retained, notwithstanding that the unit of measure—the minim—bears no simple relation to the unit of weight—the grain.

In the next edition, published in 1867, the same systems were directed to be used for the preparation of medicines; but instead of re-affirming the desirability of prescribers abandoning the drachm and scruple weights, the use of them was made optional. In deference to the general custom of using metrical weights and measures for chemical analysis, the metric system was introduced as an alternative in the processes for the volumetric estimations in this edition. After a lapse of eighteen years the present edition appeared. As I intend to consider with some little detail the weights and measures specified for use in compounding its formulas, I venture to quote at length the short paragraph of the preface which deals with this matter:

"An attempt has been made to introduce a method of setting out the relative quantities of ingredients used in some of the processes by supplementing the respective weights and measures by proportional parts. It was at first proposed that the use of parts should

altogether supersede that of weights and measures, but it was thought better, at least for the present, merely to supplement weights and measures by parts when the context permits, and where this can be made more clearly to show the proportion which the several parts bear to each other. Wherever this method is employed the term 'parts' signifies parts by weight, and the term 'fluid parts' signifies the volume of an equal number of parts of water."

AMBIGUITY.

Although the editors appear to have fully recognised the difficulties incident to the use of the imperial ounce of 437.5 grains, it is extremely disappointing to find such frequent evidence of their indecision as to the value in grains of the eighth part and the half of an ounce. From the lists setting forth the strengths of the galenical preparations it appears that sometimes the eighth of an ounce is 54½ grains (tinct. sumbul, etc.), and sometimes 55 grains (infus. gentian. comp.). The same lack of decision is shown in the various ways the same fact is expressed. Thus the infusions of valerian, rhubarb, and roses are all directed to be made with a quarter of an ounce of the drug to 10 ounces of water. In the lists of preparations given under the respective drugs, three different ways of expressing the strength are made use of: infusion of valerian is 220 grains to a pint, infusion of rhubarb 11 grains to an ounce, and infusion of roses half an ounce to a pint. In the case of tinctures sometimes the strength is given as 2½ ounces to one pint, and sometimes as 54½ grains to one ounce. Instead of forming a useful feature of the Pharmacopoeia the lists of preparations given under the drugs and chemicals are liable to give rise to considerable confusion. Ambiguity is not confined to the expression of the quantities, but is imported into the inoffensive little prepositions "in" and "to." In common speech and in pharmaceutical terminology they have meanings which are certainly not identical, but in the Pharmacopoeia they are frequently used in precisely the same sense. Under extract of siccotrine aloes it is stated that the compound decoction of aloes contains "4.3 grains in one fluid ounce," and under myrrh it is said that there are "2.3 grains to one fluid ounce" of the compound decoction. The same mistake is made with regard to linimentum sinapis compositum, which contains one fluid drachm of castor oil to one fluid ounce, and 8 grains of the ethereal extract of mezereum in one fluid ounce. "To" connotes the idea of addition, an idea which is foreign to both the examples mentioned.

The principal difficulty in the use of the weights and measures adopted by the Pharmacopoeia authorities lies in the fact of the ounce of water having a weight of 437.5 grains and a measure of 480 minims. The result of this is that a solution containing 1 part of a solid in 10 parts, if compounded in weights and measures of denominations above an ounce, will not contain 1 grain in 10 minims, but 1 grain in 11 minims, and 10 minims will only contain 0.91 grain.

A TRANSITIONAL PERIOD.

Although the paragraph quoted from the preface of the Pharmacopoeia does not contain a definite statement of the reasons which led to the adoption of the system of proportional parts, there can be but little

* Reprinted from the *British Medical Journal*.

doubt that it was because the editors felt the great need there was for a system of weights and measures which would permit of centesimal calculations, and they did not see their way to the introduction of the metric system without first establishing a period of transition. The intention was decidedly good, especially as provision was made for the measuring of liquids in accordance with English practice, and not for the weighing of them according to Continental custom. According to what rules it has been applied in the formulae of the Pharmacopœia I cannot discover. The preface says that it has been employed "when the context permits, and where this can be made more clearly to show the proportion which the several parts bear to each other." This can scarcely have been the only cause for the erratic manner, from the point of view of the preface, in which "parts" formulae are distributed throughout the Pharmacopœia. All the ointments have alternative "parts" formulae, whereas only one tincture is so treated. The uniform application of this system to the ointments cannot be for the reason given in the preface, because in some cases nothing whatever is gained in clearness. For example, the ointment of oleate of zinc, in which 1 ounce of each of the two ingredients is directed to be taken, what help is rendered by giving as an alternative the directions for 1 part of each?

Some inexplicable inconsistencies are to be found among the ointments in the relation the two sets of formulae bear to each other. Unguentum belladonnæ and unguentum hydrarg. ammon., are directed to be made with 1 part of the active ingredient and 9 parts of the base; but in the former ointment 1 part equals 50 grains, and 9 parts equal 1 ounce (437·5 grains), and in the latter 1 part equals 50 grains, and 9 parts equal 450 grains. It were a waste of time and space to speculate upon the reasons for such anomalous statements. I shall therefore content myself with giving a few more instances to show what a hopeless muddle has been made of what might have been a real stepping-stone to a metric system of weights and measures suited to British requirements. The one tincture favoured with a formula in "parts" is tinctura podophylli; it is given as resin of podophyllum 1 part, rectified spirit 54·68 fluid parts. One cannot help wondering how this quantity is to be measured without first making an elaborate calculation. Tinctura quiniæ has precisely the same strength, but no alternative "parts" formula is given; vinum ferri citratæ has also the same strength and a "parts" formula, but instead of agreeing with that of tinctura podophylli it appears as 1 part of the active ingredient and 55 fluid parts nearly "of the vehicle. Surely the editors must have unbounded confidence in the skill of the men who compound the recipes of the Pharmacopœia, otherwise they would hardly expect them to successfully measure "55 fluid parts nearly." This cannot be seriously intended for a working formula; it is merely a display of the variety of ways in which the same statement may be expressed. The fear of being monotonous has been a bogey—haunting the

compilers with a tiresome persistence. As in the imperial weights and measures, so in the "parts" dull uniformity has been most successfully avoided. Unguent. gallæ, ung. hydrarg. subchlorid., and ung. zinci all have a strength of 80 grains to 1 ounce of base; in equivalent parts it is given in the first as 1 part and 5·5 parts, in the second as 1 part and 5·47 parts, and in the third as 2 parts and 11 parts. It is true that these whimsicalities do not interfere with the production of reliable preparations by the discreet pharmacist, but they do detract very considerably from the value of the Pharmacopœia as a standard work of reference.

INACCURACIES.

The formulae of some of the galenical preparations are open to a much greater objection than those already noticed. They either do not yield preparations of the strength they are stated to have, or the two alternative formulae give different results. The compound rhubarb pill is directed to contain 90 minims of oil of peppermint in the Pharmacopœial quantity of mass, but according to the "parts" formulae it will only contain 80 minims. Many instances of errors of this kind are found among the so-called percentage solutions of alkaloids and other poisonous substances. Attention has been so frequently called to these errors that it may seem superfluous to do more than mention them. But at the risk of being considered prolix, I venture to particularise a few of the more apparent discrepancies. Liquor arsenicalis should contain 87·5 grains instead of 87 grains of arsenious acid to carry out the intention of the editors. In Donovan's solution the proportion of the active ingredients is given as 90 grains to the pint instead of 87·5. It would seem the easiest thing in the world to make such simple solutions as liquor atropinæ sulph. and liquor sodii arseniatæ to at least correspond with one another, and they are both stated to have a strength of 1 in 100. Yet the former has 9 grains dissolved in 16½ fluid drachms of camphor water (1 in 101 fluid grains), and the latter 9 grains in 2 fluid ounces (1 in 98·2 fluid grains).

The greatest deviation from the percentage ideal occurs in the liquor strychninæ hydrochl., in which no allowance has been made for the condensation of the mixture of rectified spirit and water; accordingly the first formula results in a strength of 1 grain in 96·7 fluid grains, and the second in a strength of 1 grain in 97 fluid grains. In these alkaloidal solutions a deliberate attempt was made to approach true percentage solutions as understood by pure chemists. The effort has been anything but successful. Even if it had been successful, I fail to see of what service it would have been either to the medical man or the pharmacist. In devising formulae for liquid medicines there are two considerations which should be kept in view: first, the convenience of the prescriber in ordering with certainty and ease the exact quantity of a medicament in any proportion he may desire, and in remembering the exact strength of all galenical preparations; secondly, the welfare of the patient in being able to measure exactly the prescribed quantity of a medicament when exhibited in the liquid form.

Supposing these alkaloidal solutions do contain 1 grain in 100 fluid grains, the prescriber, if he desires to order a quarter of a grain, must direct the pharmacist to use $2\frac{1}{4}$ minims, because the fluid grain is not a legalised measure. There at once arises the difficulty of measuring the exact quantity, and the prescriber is required not only to remember that these are so-called percentage solutions, but he must also remember the relation of fluid grains to minims. The medical man's difficulty creates that of the patient, who very rarely, if ever, gets in a dose an aliquot part of a grain of these strong remedies. These solutions are not true percentage solutions because the specific gravity of them is altogether ignored. They are, therefore, neither scientifically correct nor practically useful.

THE END TO BE SOUGHT.

As the measuring of liquid medicines by patients is so convenient and so desirable for the ensuring of accuracy of dosage, it cannot be denied that the only practically useful system for formulae for liquid preparations is to have the medicament expressed in terms of weight which are integral parts of the terms of measure. All galenical preparations, standardised or not standardised, should conform to this rule.

In the forthcoming Pharmacopœia, the simplest way out of the difficulty with regard to percentage preparations would be to adopt the metric system, but modified according to the American plan by measuring instead of weighing all liquids. The non-legalisation of the metric weights and measures for purposes of trade in this country is, however, a great difficulty, but it may possibly be overcome ere the publication of the next Pharmacopœia. If it should only be used in alternative formulae, confusion and inexactness will be again introduced into all the preparations which are prescribed and dispensed in minim quantities. These articles ought to be compounded and prescribed in terms of the metric system only; but if the imperial weights and measures are used, then they ought to contain an integral number of grains in an integral number of minims.

The charming diversity in expressing the strengths of preparations in the present Pharmacopœia has very serious drawbacks, which do not even need to be mentioned. In future a uniform system of expressing them should be adopted, and I would suggest that the centesimal proportions should be used—so many units of weight in 100 units of volume. To ensure accuracy, liquid preparations should be made up, after the lapse of an adequate period of time to allow of condensation or cooling, to a given volume, with a suitable liquid at a given temperature.

Analytical operations are very rarely carried out with grains and fluid grains, the metric system being almost universally adopted in laboratories. For this reason, if for no other, it is extremely desirable that the quantitative tests of the Pharmacopœia should be set forth in terms of the metric system, and that the results should be given as percentages.

CHEMICAL NOTES.

CONSTITUENTS OF COTO BARK.—In 1880 Jobst and Hesse (*Ph. J.* [3], x., 521) described certain constituents of coto and paracoto bark which were non-alkaloidal and differed in the two barks. In coto bark they found *cotoin*, $C_{22}H_{18}O_6$, and *dicotoin*, $C_{44}H_{34}O_{11}$, and in the paracoto bark five substances, the chief of which are *hydrocotoin*, $C_{15}H_{14}O_4$, and *paracotoin*, $C_{19}H_{14}O_6$. In both barks piperonylic acid was found. To a C_6H_5  CH_2 $COOH$ cotoin prepared by Elborne from Venezuela coto, Cohen

Piperonylic acid.

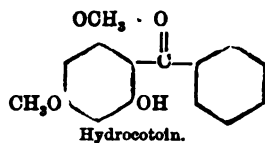
ascribed the formula $(C_7H_8O_2)_n$, the molecular weight not being determined. The matter has since been investigated by Ciamician and Silber, the greater part of whose work has since been confirmed by Hesse.

Hesse's formula for hydrocotoin was confirmed, and the presence of two methoxyl groups (OCH_3) demonstrated by formation of methyl iodide by heating with hydriodic acid (Zeisel's method), and the presence of a benzoyl nucleus was indicated by the formation of benzoic acid when fused with potash.

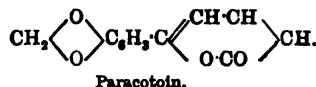
When hydrocotoin was treated with phosphorus pentachloride, benzo-trichloride and a substance of the formula $C_8H_7Cl_2O_2$ was obtained, and by reaction of the pentachloride with methyl-hydrocotoin (obtained by the action of methyl iodide and potash on hydrocotoin), benzo-trichloride, and a compound of the formula $C_6Cl_4(OCH_3)_2$ were formed.

This latter compound on reduction yielded 1, 3, 5, trimethoxy-benzene. From this it follows that hydrocotoin itself must contain a benzoyl (C_6H_5CO) nucleus attached to a dimethyl-phloroglucinol residue [$C_6H_2(CH_2O)_2OH$] and will therefore be as shown.

The exact linking is not yet demonstrated. Similarly protocotoin, another constituent in the bark,



was found to be the dioxy-methylene derivative ($C_{18}H_{14}O_4 \cdot O_2CH_2$). The other constituents of paracoto bark were shown to be methyl-hydrocotoin, methyl-protocotoin and paracotoin. Paracotoin has the formula $C_{19}H_{14}O_6$, and is the dioxy-methylene derivative of phenyl coumalin, a substance found in coto bark.



The constitution of these bodies was proved by the production of piperonylic acid, acetopiperone, and other products, on fusion with potash.

Cotoin, the chief constituent of coto bark, was next examined, and found to have the formula $C_{22}H_{18}O_6$, and the constitution is represented by the formula $CH_3O \cdot C_6H_4 \cdot (OH)_2 \cdot CO \cdot C_6H_5$. It is the monomethyl ether of benzoyl-phloroglucinol, just as hydrocotoin (*q.v.*) is the dimethyl ether. The constitution was proved by methods similar to those employed in the case of hydrocotoin. If these formulæ are correct it should be possible to prepare synthetically one of these products.

By the reaction of the trimethyl ether of 1-3-5 trihydroxy-benzene (phloroglucinol) with benzoyl-chloride in the presence of zinc chloride, a tri-methyl-benzoyl-phloroglucinol was obtained, which was found to be identical with methyl-hydrocotoin. The identity was proved by crystallographical and other methods.

The synthesis of one of these compounds having been completed, the correctness of the formula proposed is placed beyond doubt.

Heese has also since shown that the dicotoin described by him is not a pure product but a mixture.

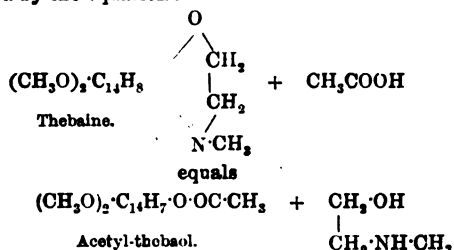
THEBAINE.—The exact relation of thebaine to the accompanying alkaloids—morphine and codeine (methyl morphine)—in opium has been an unsettled question, but Freund (*Ber.*, xxvii., 2961; xxviii., 941) has now published the accounts of experiments which conclusively prove the constitution of thebaine.

When thebaine is acted on by dilute acids methyl alcohol is produced, in addition to a base—thebenine—not isomeric with thebaine, as previously stated.

When thebenine methiodide is fused with alkalis all the nitrogen is split off, as trimethylamine, and a non-nitrogenous substance—thebenol— $C_{17}H_{14}O$, left. This latter compound on reduction with zinc dust or hydrogen iodide and amorphous phosphorus yields a hydrocarbon, probably ethyl-phenanthrene.

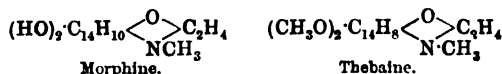
When thebaine methiodide is treated with alkalis tetra-methyl-ethylene-diamine is obtained, and not trimethylamine (Howard and Roser, *Ber.*, xix., 1596).

When thebaine is boiled with acetic anhydride a new compound—acetyl-thebaol and methyl-oxo-ethylamine—is formed, the reaction probably being represented by the equation:—



By removing the acetyl radical by alkali, thebaol, $(\text{CH}_3\text{O})_2\text{C}_{14}\text{H}_7(\text{OH})$, was obtained.

Thebaine methiodide with acetic anhydride give similar results, but dimethyl-oxoethyl-amine was obtained. Acetyl-thebaol, on oxidation with chromic acid and acetic acid, yielded acetyl-thebaol-quinone, which with alkali yielded thebaol-quinone. The reactions of this substance showed it to be a derivative of phenanthrenquinone. Thebaine is, therefore, represented as a derivative of phenanthrene, and bears a simple relation to morphine:—



ELDER FLOWERS of excellent appearance and odour have proved (*Nordisk farm. Tidskr.*) on close examination to contain florets of *Achillea millefolium*.

BOTANICAL NOTES.

INFLUENCE OF CALCIUM AND MAGNESIUM ON THE GROWTH OF PLANTS.—As the result of experiments on the growth of various algae, chiefly species of *Spirogyra*, *Zygnema*, and *Mesocarpus*, Herr Th. Bokorny states that calcium is more indispensable to their growth than any other mineral element except potassium, without which the proteids cannot be formed. In the absence of calcium, vegetable growth is very feeble. The want of this element has especially a deleterious effect on the formation of chlorophyll, while the absence of both calcium and magnesium acts prejudicially on the development of the nucleus (*Botanisches Centralblatt*, volume lxix., 1895, page 1).

SUGAR OF AGAVE.—In 1892, MM. Michaud and Tristan claimed to have separated from the sap of *Agave americana* a new sugar with the formula $\text{C}_{12}\text{H}_{22}\text{O}_{11}$, to which they gave the name agavose, differing from all others of the same group, except synanthrose, by its inactivity. From a careful series of experiments, Mr. W. E. Stone and Mr. D. Lot (*American Chemical Journal*, May, 1895) now state their conclusion that this sugar has been erroneously described as having distinct properties, and that it is identical with sucrose.

ACTION OF THE WATER OF THE SOIL ON VEGETATION.—From a series of experiments on the growth of plants in different soils, chiefly on *Erigeron canadensis* and *Phaseolus multiflorus*, and on the production of root-tubercles in *Lupinus albus*, M. E. Gain asserts that each species has its own optimum of humidity, and that this has a special influence on the development of the tubercle-microbe *Rhizobium leguminosarum*; this optimum further varying in each species, according to its stage of growth. Saturation of a soil previously dry introduces important perturbations in the supply of sap. Transpiration is most energetic when the soil is moist. If the optimum of turgescence of a plant is exceeded, transpiration decreases. There is, in fact, at every moment of growth an optimum turgescence for the functions of nutrition (*Bonnier's Rev. Gén. de Botanique*, 1895).

ABNORMAL GERMINATION.—Herr A. Winkler has collected together all the examples known of abnormal modes of germination. Cotyledons are wanting in *Ranunculus ficaria*, *Corydalis bulbocampnos*, and *Cuscuta*; while *Ranunculus glacialis* and *Cerium bulbocastanum* have only one cotyledon. Subterranean germination takes place in a number of plants. In others either the cotyledons themselves or their pedicels form a sheath which encloses the growing point; while a coalescence of the laminae of the cotyledons takes place also in the horse-chestnut. *Cerato-phyllum* and all species of *Linum*, except *L. flatum*, have apparently four cotyledons. A number of examples are also recorded of deviations from the ordinary form of cotyledons, of inequality in the size of the two cotyledons, and of abnormalities in the development of the seedling (*Verhandl. Bot. Verein Prov. Brandenburg*, 1895, p. 125).

The Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JUNE 22, 1895.

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Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

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PATENTED MEDICINES AND REGISTERED NAMES.

IN the recently published supplement to the German Pharmacopœia two preparations were made official, both of which are claimed to be protected under the German law. These two preparations are Liquor Cresoli Saponatus, which is patented as lysol, and sublimate pastilles, the size and shape of which have been registered. These two cases have given rise to much discussion in German pharmaceutical journals, partly concerning the validity of the protection claimed in these particular instances, and partly the general question whether medicinal preparations should not be outside the scope of the patent and registration laws. Quite recently, too, a patent, of doubtful validity it is true, has been granted to G. F. MEYER for a new method of preparing vegetable extracts, in which sodium chloride plays an important part. Should the validity of this latter patent, or of any similar one, be proved, and the patented process establish its superiority, the pharmacopœia authorities will eventually have to solve the problem whether they shall introduce a superior patented process, and practically create a monopoly, or remain content with an inferior process open to general use. These cases have induced the *Pharmaceutische Zeitung* to discuss the question whether protection by patent is attended with advantage or disadvantage to the pharmacist and to pharmacy generally, and what course is to be adopted by the German Pharmacopœia authorities if such patents for medicinal substances or methods of preparing them continue to increase. Pointing out on the one hand the injustice of excluding from the privileges of patent rights one class of inventors whose brain work has been directed into a particular channel, and on the other hand the

advantages that accrue to the community from the freedom with which a patentee whose results are protected can develop his patent, the *Pharmaceutische Zeitung* considers that the possibility of patenting a medicinal substance has been distinctly advantageous to the community at large, by facilitating the rapid dissemination of medicinal agents that have proved themselves really useful. With respect to patented methods it is sufficient, says the journal referred to, that extract of opium, for example, shall be required to possess certain characters; how or by whom the extract is prepared is a matter of no moment, provided only it complies with the requirements laid down. It is for the Pharmacopœia authorities and for the craft to protect themselves from unpleasant consequences by careful attention to, and more extended recognition of, the rights legally due to valid patents and registered trade marks.

The advantages that accrue to the community from the protection afforded by the patent laws and trade mark regulations to the brain work of non-capitalists are sufficiently evident. Manifestly it would be unreasonable, unjust, and indeed impossible to exclude from the enjoyment of such protection those whose industry has taken a particular direction. The more important question, and one which at the present moment is vexing both pharmacists and physicians in this country, relates to the introduction of such patented preparations or methods of preparation into the national medicine book. Shall patented preparations or methods be admitted, directly or indirectly, into the British Pharmacopœia? The chief consideration affecting the reply to this question is that the Pharmacopœia has for its object the definition of substances which the physician prescribes, and such as are required to be kept at one safe and uniform standard of strength and composition; in other words, the object of the Pharmacopœia is the control of the quality of certain selected medicines. At first sight it would appear that by defining the characters which patented preparations must possess, their safe and uniform strength and composition would be guaranteed, and their quality controlled. But in this case, as with all monopolies, the control which the Pharmacopœia can directly exercise over such preparations is illusory, and this applies equally to chemical compounds and to galenical preparations so defined as to be producible by one process only, and that one patented.

That this is so is clear when it is considered that the monopolist has it in his power to change the composition of his patented preparation within limits determined by the patent; this, in the case of such patented methods as the sodium chloride process for vegetable extracts, being not only conceivable but probable. In such cases the pharmacist would

be powerless to effect any change, to exercise any control, and might possibly find himself called upon by the physician to supply an article which he could not obtain, of the quality demanded, from the monopolist, whilst the law would not permit him to manufacture it. Not single preparations only but whole classes of preparations might in this way become the property of monopolists, into whose power the pharmacist and the physician, bound hand and foot by the Pharmacopœia, and through them the whole community, would be completely delivered. Still worse will be the case with preparations introduced under registered names, for a patent is terminable, but a registered name may endure for ever. The compromise effected in the Addendum to the British Pharmacopœia in 1890 by which patented preparations were introduced under newly coined names has proved futile; "phenazonum" is so seldom prescribed that it might be expunged, and there appears to be no other satisfactory course than to rigidly exclude all patented preparations and methods and all registered names. English pharmacists would then be delivered from the cares that are harassing their German colleagues. At the same time no injustice would be done to the inventor, physician, or community, for the first may protect his work, the second order monopolised preparations, and the third enjoy all the benefit possible from both. But to lay upon the pharmacist the paradoxical burden of controlling constantly increasing uncontrollable preparations is manifestly unreasonable and unjust. When by the expiration of the patent rights the manufacture of such preparations is free, then, and not till then, should they find a place in the national medicine book, and then only under a name not registered. Physicians may then prescribe under that new special name a remedy directly controlled by the Pharmacopœia they compile, or under the old registered name a similar preparation controlled by the monopolist manufacturer.

PHARMACOPEIAL WEIGHTS AND MEASURES.

THE editor of the *British Medical Journal* is to be congratulated on having secured the services of a well-known pharmacist to contribute an article dealing with weights and measures, in the series on the approaching revision of the British Pharmacopœia. This article, by Mr. WILLIAM KIRKBY, is reproduced at page 1173 of this week's Journal, and will be found to describe the anomalies existing under the present arrangements both clearly and succinctly. That much confusion has been caused by the use in pharmacy, side by side, of two distinct ounce weights, and the lack of simple relation between the units of weight and measure, is too well known to require emphasising. That more confusion, indicated by the existence of curious discrepancies

and marked inaccuracies, has resulted from the erratic manner in which quantities are stated in the Pharmacopœia, in terms of the imperial system, is easily shown by Mr. KIRKBY.

Pharmacists generally, therefore, will gladly welcome any change which tends to simplify matters and strengthen their hands in the matter of attaining greater accuracy and uniformity. They will also sympathise with and cordially support the statement that the only practically useful system for the formulæ of liquid preparations is that according to which solids are weighed and liquids measured, this holding good for the convenience of physician, dispenser, and patient alike. All galenical preparations should certainly conform to this rule, whether the quantities be expressed in terms of the imperial or metric system, or both. Ultimately, the metric system of weights and measures will doubtless entirely supplant the imperial system, in the British as in other pharmacopœias. Meanwhile, however, it may appear, on the whole, wiser to represent the terms of both, side by side.

The last method is that which there is every reason to expect will be adopted, and it is to be hoped that the contrast between the two systems, which will in reality serve the present generation as an easy transition from the old to the new, will not be muddled by the introduction of the fluid grain in place of the minim. Few realise practically what a fluid grain is, and its introduction during a transitional period would but make confusion worse founded. The imperial system should be stated in its simplest terms—grain, ounce, pound, minim, pint—without intermediate steps; and similarly, the metric system should be marked with equal simplicity—milligramme, gramme, kilogramme cubic centimetre, litre. The convenience of the metric system will soon demonstrate itself in the compounding of official preparations. If, then, medical practitioners will but acquire the habit of prescribing in terms of the same system, it may reasonably be anticipated that before another British Pharmacopœia is needed, the time will be ripe, and both medical men and pharmacists will be ready, for its exclusive use.

QUALIFICATIONS OF PUBLIC DISPENSERS.

A GENERAL order has just been issued by the Local Government Board altering the regulations concerning the qualification of dispensers, in thirty-nine unions and separate parishes, the unions being those of Birkenhead, Cardiff, City of London, Derby, Fulham, Gloucester, Greenwich, Hackney, Holborn, Nottingham, Plymouth (Incorporation), Poplar, Portsea Island, Reading, St. George's, St. Olave's, St. Saviour's, Stepney, Strand, Walsall, Wandsworth and Clapham, Westminster, Whitechapel, Wolverhampton, Woolwich,

and the separate parishes, those of Birmingham, Mile End Old Town (Hamlet), Paddington, St. George-in-the-East, St. Giles (Camberwell), St. Giles-in-the-Field and St. George, Bloomsbury (United Parishes), St. Leonard (Shoreditch), St. Luke (Chelsea), St. Mary Abbots (Kensington), St. Mary (Islington), St. Mary (Lambeth), St. Marylebone, St. Matthew (Bethnal Green), and St. Pancras.

The effect of the alterations is that for a person to be qualified for appointment as a dispenser in any of the above-mentioned unions and parishes he must be a Licentiate of the Society of Apothecaries of London or a qualified Assistant of that body, or he must be registered under the British or Irish Pharmacy Acts, or "a compounder of medicines duly qualified in accordance with the Regulations for the Army Medical Staff Corps." According to these Regulations, non-commissioned officers and privates who have had six months' training and instruction in the surgery of a military hospital are entitled to qualify as compounders of medicines. They are instructed during that time in a knowledge of Latin names and words, and the symbols used in prescriptions and on the printed labels used in a dispensary, but are not expected to be able to translate into English instructions written in Latin. They must also know the B.P. drugs, their appearance, taste, odour, and dose; as well as the official preparations of the drugs, their composition and dose. The names, characters, and dangerous doses of poisons are to be studied, and a knowledge gained of antidotes and measures to be adopted in cases of poisoning. The reading, making up, labelling, and mode of administration of the remedies ordered; the names and proper care of surgical instruments and other appliances; and the preparation of returns of medical stores, surgical instruments, etc., are the remaining matters to which attention must be devoted.

It is quite evident that this course of training is far from deserving to be compared with that of persons qualified under the Apothecaries or Pharmacy Acts, even though the six months' course be supplemented by an examination. With regard to the system of examination adopted it is difficult to speak, for although paragraph 224 of the 'Manual for the Medical Staff Corps' distinctly states that "the rules regarding examination for compounders of medicines are contained in the Regulations for Army Medical Services," the most careful search of the latest edition of the Regulations fails to reveal the faintest scrap of information on the subject, and the authorities can be cordially congratulated on their skill in hiding the rules. Whatever these may be, however, the fact remains that individuals with no knowledge of the subject worth mentioning are placed upon an equal footing

with others who are required to produce evidence of being thoroughly skilled as dispensers. It may be that the reason for entitling army compounders to be appointed as public dispensers is the outcome of a desire to afford employment to soldiers whose time of service is expired, but this, though perhaps laudable in intention, is hardly in accordance with modern notions of what is requisite for the public safety.

HERBARIUM PRIZE.

SUBSCRIBING "Students" of the Pharmaceutical Society, under twenty-one years of age, are reminded that Monday, July 1, is the latest day on which collections of plants can be received for the Herbarium Prize competition, by the Secretary of the Pharmaceutical Society, 17, Bloomsbury Square, W.C. No collection may contain more than one hundred and fifty specimens, and these must be carefully selected and mounted so as to display characteristic generic features of British phanerogams and ferns, quality of work being considered rather than number of specimens in awarding the prize. Last year only two collections were sent in, and neither was regarded as worthy of the Silver Medal offered, so that the competition cannot be regarded as being either excessive or unduly severe.

PROCEEDINGS UNDER THE PHARMACY ACT.

At the Bloomsbury County Court, on Thursday last, the case of the Pharmaceutical Society v. Hills, adjourned from May 23 (see *ante*, p. 1107), came before His Honour, Judge BAUGH. The defendant, Mrs. LAVINIA HILLS, of 91, Lower Marsh, Lambeth, was sued for a penalty in respect of the sale of Powell's balsam of aniseed, but claimed that her deceased husband was in business before 1868, and that she was therefore entitled to carry on the business under Clause XVI. of the Pharmacy Act, 1868. It appears, however, that the deceased never became registered as a chemist and druggist, and, moreover, the assistant conducting the business, described as a qualified apothecary, is not a "duly qualified assistant" within the meaning of the Clause, which stipulates that such assistant shall be a Pharmaceutical Chemist or a Chemist and Druggist, registered by the Registrar under the Pharmacy Acts. Judgment was given for the Society (see page 1189).

PROPOSED BOARD OF REFERENCE.

In giving evidence as Chairman of the Special Purposes Committee of the Kensington Vestry, before the Select Committee on Food Products and Adulteration on Tuesday last (see p. 1186), Mr. R. A. ROBINSON was careful to point out that a satisfactory Board of Reference should include a nominee of the Pharmaceutical Society. The suggestion which has been made that the General Medical Council's nominees might fairly be regarded as representing pharmaceutical interests is not worth a moment's consideration. Representation to be of any real value should be direct, and if other traders affected by the Sale of Food and Drugs Acts were combined into recognised societies, they also should be entitled to nominate representatives.

Proceedings of Societies in London.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, May 30, Mr. J. R. Walker occupying the chair.

A paper was read on—

COMMERCIAL LIQUID EXTRACT AND TINCTURE OF CINCHONA.

BY HAROLD BROWN.

In selecting a subject for a short paper for this Association, the idea suggested itself that it would be interesting, in view of the present demand for an increased number of standardised preparations in the new Pharmacopœia, to see how far some commercial samples of one of the already standardised preparations came up to the prescribed strength.

The choice of such at present is not very wide, and we are restricted to preparations of three drugs: opium, nux vomica, and cinchona. The latter was chosen because as far as our experience goes its standardised preparation—the liquid extract—is rarely either prepared by the retail pharmacist or the bought article assayed by him, and we are consequently at the mercy of the wholesale houses.

At the same time samples of the tincture were examined, for, although not standardised, it is directed to be made from bark of a definite strength, and might therefore be expected to yield fairly constant results. A number of samples of each were obtained from representative sources, and the following are the results of their examination:—

Liquid Extracts of Cinchona.

The samples were of uniform appearance, except No. 2, which was exceedingly light in colour and very acid. It also had a peculiar odour, recalling that of pepsin preparations. From its appearance its preparation by the official process seemed doubtful, and an attempt was made to determine the amount of extractive which it yielded compared with that from the other samples. Owing to the difficulty in getting rid of the glycerin present, which prevented a dry residue being obtained by evaporation over a water bath, this was not satisfactorily accomplished.

The official process of determination was employed, and the quantity operated on was 10 C.c. In every case the alkaloidal residue was more or less coloured.

No.	Alkaloid in grammes from 10 C.c.	Parts in 100 fluid parts.
1	·3296	3·296
2	·1745	1·745
3	·3960	3·960
4	·4700	4·700
5	·5347	5·347

From these figures it will be seen that of the five samples examined, two were fair approximations to the official standard of 5 per cent., while the other three showed a much lower percentage.

It would therefore seem that the standardisation of a preparation in the Pharmacopœia affords no guarantee of the strength of the commercial article.

The only virtue of standard preparations lies in their constant strength, and the pharmacist should see, either by preparing them himself or by checking the commercial sample, that that strength is maintained.

Tinctures of Cinchona.

The appearance of the samples is given in the table below. Their specific gravities were first determined. To determine the amount of alkaloid present, 1 fluid ounce was acidified with dilute H_2SO_4 and evaporated over a water bath until all the spirit had been driven off. The acid solution was filtered, rendered alkaline with ammonia, and the alkaloids extracted by agitation with chloroform. The latter was separated and divided into two equal portions. One of these was evaporated to dryness and the residue weighed. With the other an attempt was made to determine the alkaloids by titration with decinormal acid, using erythroline as the indicator. The results obtained by the latter method were very different to those yielded by the gravimetric process, being in some cases more than double. In searching for an explanation of this discrepancy reference was made to a paper by Messrs. Farr and Wright on "Gravimetric and Volumetric Methods for the Determination of the Alkaloids in Alkaloidal Tinctures," read at the last Pharmaceutical Conference. From this it appears that considerable difficulty is experienced in assaying the cinchona alkaloids by titration, owing to the indistinct end-reaction. In their hands, using methyl-orange, iodeosine and phloxine as indicators, the process gave very abnormal results; in some cases twice as great as those obtained by weighing. The following table is calculated from the gravimetric results.

No.	Specific gravity.	Alkaloid in grains per fluid ounce.	Percentage of alkaloid extracted if tincture had been made with bark of standard strength—5·5 per cent. total alkaloid.	Appearance, colour, etc., of specimens.
1	·948	0·8838	18·40	Clear, light colour.
2	·942	1·3549	28·15	Clear, dark colour.
3	·985	1·8842	28·24	Clear, light colour.
4	·948	1·0833	22·61	about eight years o'd.
5	·948	1·8708	38·86	Clear, very dark colour.
				Clear, dark colour.

The specific gravities found appear to be about the average, and do not indicate any considerable deficiency in spirit. The amount of alkaloid present was, however, so low in some cases that previous papers on the subject were referred to for comparison.

Some years ago Mr. Ward, of Liverpool, examined several samples of the tincture, and found that the specific gravity varied from ·9411 to ·9557, while the alkaloid from 1 fluid ounce varied from ·7716 to 1·8827 grains. A sample prepared specially by himself for the purposes of comparison with bark and spirit of official strength, had a specific gravity of ·9520, and yielded 1·9398 grains of alkaloid per fluid ounce. He therefore concluded that when the tincture is prepared in strict accordance with the official process only 44·27 per cent. of the alkaloids present are extracted. Messrs. Farr and Wright, however, in their work on the tinctures, have found that alcohol

of 50 per cent. strength (by volume) will extract 60 per cent. of the alkaloids present when the official process is employed.

Looking at the much lower percentages found the conclusion seems to be that the majority of the specimens were made from bark much below the official strength, and pharmacists who prepare their own tinctures would do well to first ascertain the quality of the bark supplied.

That such an important preparation as tincture of cinchona should show such variations in its strength cannot be regarded as very satisfactory. Standardisation is of course suggested as the only remedy, though our experience of the liquid extract has somewhat shaken our faith in the efficacy of this. However, suggestions have already been made by Messrs. Farr and Wright for this object, and perhaps these may be acted upon.

The paper was followed by a discussion, in which the Chairman, Secretary, Messrs. Bastow, Jealous, Davis, and Lilly took part.

The Secretary stated that he had received a communication from Mr. C. S. Ellis—whose report on organic chemistry should have been read at this meeting—to the effect that he had not prepared it; also that he had received a similar communication from Mr. R. G. Guyer respecting his report on analytical chemistry, due at the next meeting. The following resolution was thereupon unanimously passed: "That the Association regrets the failure of some of the reporters on science to carry out the duties they undertook, and hopes that in future members will be selected for the office who can be relied upon to fulfil their obligations."

A meeting was held on Thursday, June 13, Mr. T. A. Henry, Vice-President, in the chair. Mr. H. T. Durant, Reporter on Physics, read a report on:—

THE LIQUEFACTION OF GASES.

In this, the author gave a brief sketch of the methods used in the liquefaction of the gases up to the present time, together with some of the more important results and deductions. Faraday liquefied chlorine in 1823, and Davy subsequently obtained a similar result with sulphurous anhydride, hydrocyanic acid, and hydrochloric acid. In 1835, Thilorner liquefied carbon dioxide, and since then most of the so-called "permanent" gases have been reduced to the liquid form. Cailletet and Pictet's work was referred to, and Dewar's work was also dealt with at some length.

A discussion followed, in which the Chairman, Secretary, Messrs. Bastow, Walker, and Jealous, took part.

RADLAUER'S BISMUTHOL is sodio-bismuthic phospho-salicylate. It is said (*Apoth. Zeitung*) to combine in one preparation the antiseptic properties of bismuth, phosphoric acid, and salicylic acid.

ROYAL INSTITUTION OF GREAT BRITAIN.

SCIENTIFIC USES OF LIQUID AIR.*

BY PROFESSOR DEWAR, M.A., LL.D., F.R.S., M.R.I.

When Faraday was working on liquid gases in this Institution about 1823, with such means as were then at his command, his inquiry was limited to the determination of the specific gravities and vapour pressures of such bodies. Twenty years later, by the use of solid carbonic acid, the greatest cold then possible was obtained, and Faraday made admirable use of Thilorner's new cooling agent to extend his early investigations. Just as liquid carbonic acid produced in glass tubes was of no use as an agent for effecting the liquefaction of more resisting gaseous matters, until it could be manipulated in the solid state, so liquid air, until it could be handled, stored and used in open vessels, like any ordinary liquid, could not be said to possess scientific uses in any wide sense. Such operations become easy when double-walled vacuum vessels (such as were described in a former lecture) are employed in the conduct of experiments where substances boiling at very low temperatures have to be manipulated. The chief scientific use of liquid air consists in the facilities it gives for the study of the properties of matter at temperatures approaching the zero of absolute temperature. In this lecture the expression liquid air may mean either oxygen or air. Where a constant temperature is required, oxygen is used. Liquid air made on the large scale may contain, after it is collected in open vacuum vessels, as much as 50 per cent. of oxygen. Such a liquid boils between -192° and -182° C., and the longer it is stored the nearer it comes to -182° C., or the boiling point of pure oxygen. For a number of experiments of a qualitative character, whether it is liquid air or oxygen that is used makes no difference. In many of the experiments to be recorded, liquid oxygen made from the evaporation of liquid air was employed. In pursuing this subject in consort with Professor Fleming,† a long series of experiments, involving the use of large supplies of liquid oxygen, have been carried out on the electric resistance of metals and alloys, and the results warrant the conclusion that at the zero of absolute temperature all the pure metals would be perfect conductors of electricity. Under such conditions a current of electricity started in a pure metallic circuit would develop no heat, and therefore undergo no dissipation. Similarly, we infer there would be no Peltier effect at the zero. In other words, the passage of electricity from one metal to another would take place without evolution or absorption of heat.

Further investigation, along with Professor Liveing,‡ on the refractive index of liquid nitrogen and air, has led to the conclusion that the refractive indices of nitrogen and air are respectively for the D-ray, 1.2053 and

* Lecture delivered January 19, 1895.

† 'The Electrical Resistance of Metals and Alloys at Temperatures Approaching the Absolute Zero,' by James Dewar, LL.D., F.R.S., and J. A. Fleming, M.A., D.Sc., F.R.S., Professor of Electrical Engineering in University College, London.—*Phil. Mag.*, 1893.

‡ 'On the Refractive Indices of Liquid Nitrogen and Air,' by Professors Liveing and Dewar.—*Phil. Mag.*, 1893.

1-2062. In these determinations, instead of using the prisms we have employed the method of Terguem and Trannim, which consists in suspending in the liquid two plates of glass with a thin layer of air between them, and measuring the angle of incidence at which the chosen ray suffers total reflection at the surface of the air. As all the vacuum vessels are either spherical or cylindrical in form when filled with liquid, they act as lenses which are irregular and full of striations. Further, small bubbles of gas being given off in the liquid rendered any image indistinct when viewed with a telescope. In order to avoid the necessity of observing any image through the liquid, it was used simply as a lens to concentrate the light observed on the slit of a spectroscope. Under such conditions the observations were easily executed and the results satisfactory.

For some time a series of observations on the thermal opacity of liquid oxygen and nitrogen have been projected. It is, however, exceedingly difficult to experiment in such a way as to eliminate the absorbing action of the glass vessels, and as the use of rock salt is impracticable, the absorption of heat of low refrangibility remains for the present undetermined. It is possible, however, to use the glass vacuum vessels to determine approximately the relative thermal transparency for heat of high refrangibility, such as is radiated by a colza lamp. The following results represent the heat transmitted through the same vacuum vessels filled with different liquids, taking chloroform as the unit for comparison and correcting for differences of refractive index:—

Chloroform	1.0
Carbon bisulphide	1.6
Liquid oxygen	0.9
Liquid nitrous oxide	0.93
Liquid ethylene	0.60
Ether	0.50.

• From this result it follows that liquid oxygen is nearly as transparent to high temperature heat radiation as chloroform, which is one of the most transparent liquids next to carbon bisulphide. Liquid ethylene is much more opaque. These results must, however, be considered only as an approximation to the truth, and as generally confirmatory of the inferences Tyndall drew as to the relation between gases and liquids as absorbents of radiant heat.

Instead of silvering the interior and exterior of the vacuum vessels, it is found convenient when using mercury vacua to leave a little excess of liquid mercury, in order that the act of filling the inner vessel with liquid air should cause a fine silvery deposit of the metal over the exterior surface of the inner vessel. In such a vessel liquid air or oxygen shows no signs of ebullition, the surface remains as quiet and still as if it was ordinary water. The supply of heat is cut down to less than four per cent. of what it is without exhaustion and silvering in good vacuum vessels. The result is that volatile liquids can be kept thirty times longer. Such vessels do not, however, maintain indefinitely the high standard of heat isolation they possess the first time they are used. After repeated use all vacuum vessels employed in the storage and manipulation of liquid air deteriorate.

The rapidity with which a space is saturated with mercury vapour (which we know exerts a pressure of about one-millionth of an atmosphere) is easily proved by simply filling a barometer in the usual way, and then instantly applying a sponge of liquid air to a portion of the glass surface of the Torricellian vacuum space, when a mercury mirror immediately deposits. It is important to know the amount of mercury deposited from a saturated atmosphere which is maintained (containing excess of liquid mercury) at the ordinary temperature, the condensation taking place when liquid air or oxygen is discharged into a vessel surrounded by such a Torricellian vacuum. If the deposit on the cooled bulb is allowed to take place for a given time, the outer vessel can then be broken and the amount of mercury which coated the bulb ascertained by weighing. Knowing the surface of the cooled bulb, the amount deposited per unit of area can be calculated. In this way it is found that in ten minutes 2 milligrammes of mercury per square centimetre of surface was deposited. Considering that one-tenth of a milligramme of mercury in the form of saturated vapour at the ordinary temperature corresponds to the volume of 1 litre, this proves that the equivalent weight of 20 litres had been condensed in the space of ten minutes. This plan of cooling a portion of the surface of a vessel by the application of a liquid air sponge, enables us to test our conclusions as to the amount of matter present in certain vacua. Here is a globe of the capacity of 1 litre. It has been filled with, presumably, nothing but the vapour of mercury, by boiling under exhaustion and subsequent removal of all excess of liquid. Such a flask ought to contain mercury in the gaseous state that would weigh rather less than one-tenth of a milligramme, assuming the ordinary gaseous laws extend to pressures of less than one-millionth of an atmosphere. Now we know by electric deposition that one-tenth of a milligramme of gold can be made to cover one square centimetre of surface with a fine metallic deposit. Considering the general similarity in the properties of mercury and gold, we should therefore anticipate that if all the mercury vapour could be frozen out of the litre flask it would also form a mirror about one square centimetre in area. But after one such mirror is deposited, the renewed application of a second liquid air sponge to another portion of the surface would cause no visible deposit. This is exactly what takes place. If, however, two spheres, one much larger than the other, are joined together by means of a tube about 2 mill. in diameter and 50 mill. long, the whole space being a Torricellian vacuum (with some excess of mercury), then on decanting, the mercury may be transferred to the smaller sphere. Now if an air sponge is applied to a portion of the surface of the larger sphere, a mercury mirror instantly deposits, but on applying a new air sponge to another portion of the surface, no further mercury mirror is formed. The narrow glass tube prevents the excess of liquid mercury in the small bulb supplying vapour rapidly to the larger one, so that the local cooling to -180° C. of a portion of the surface has practically condensed all the mercury in the larger space, although the small one is still

filled with saturated vapour and a free communication exists between them. If while in this condition the small bulb is inclined so as to allow a drop of liquid mercury to fall into the lower side of the large bulb, which has not been cooled, instant deposition of mercury takes place on the liquid air cooled portion of the upper surface. Under very small pressure of vapour, therefore, equalisation of pressure of two bulbs communicating by a narrow tube is a very slow process. There are cases, however, in which the application of a sponge of liquid air to the surface of a vessel causes no visible deposit, and yet the inference is that something has been condensed. The best arrangement to show this effect is to select highly exhausted vacuum tubes containing phosphorescent materials like alumina and other minerals, and to arrange the induction coil spark gap of a little greater resistance than the vacuum tube. On starting the coil the current passes solely by the vacuum tube, but immediately the liquid air sponge cools a portion of the surface of the bulb, the discharge shifts to the air gap. During the cooling the phosphorescence of the glass tube is greatly increased, but finally the resistance may become so great that all discharge in the vacuum tube ceases. Some old tubes belonging to the late Dr. de la Rue have given valuable deposits near the electrodes, and in many the diameter and distribution of the striæ are materially changed during the local cooling to -190°C . When large vessels containing nothing but mercury or iodine vapour as a residuum of the vacuum space are rubbed with a cotton wool sponge of liquid air in a dark room, luminous glows filling the vessel take place occasionally, or bright flashes of light which enable the shape of the vessel to be seen. The ordinary mercury vacuum vessels show the same phenomena, which is doubtless due to electric discharges caused by friction and cooling.

The optical properties of bodies cooled to the temperature of boiling liquid air will require long and patient investigation. An interesting fact easily observed is the marked change in colour of various bodies. Thus, for instance, oxide, sulphide, iodide of mercury, bichromate of potash, all become yellow or orange; while nitrate of uranium and the double chloride of platinum and ammonium become white. Chromic acid, dilute solution of iodine in alcohol, strong solutions of ferric chloride and other coloured solutions become greatly changed. Such facts are sufficient to prove that the specific absorption of many substances undergoes great changes at the temperature of -190°C .

The tranquil atmosphere of air above the surface of the liquid in cylindrical or spherical vacuum vessels is a convenient place to cool very fragile bodies. During the slow ebullition of the fluid, gas between -190°C . and -180°C . is given off, which has three times the density of ordinary air, and it falls slowly over the mouth of the vessel in a heavy stream. On dipping into this atmosphere small soap bubbles, they contract rapidly and then freeze. If a soap film is made on a circle of thin wire about two inches in diameter, and allowed to stand until it

shows the various orders of coloured bands, and is then carefully dipped into the cool air, it freezes, showing all the original colours. The black band is, however, always broken. Speaking of films, an interesting experiment may be made with a thin stretched sheet of india-rubber, such as is used for making balloons. It is well known that stretched india-rubber contracts when heated and expands when cooled. Now this can be shown very easily by covering a glass funnel or the end of a cylindrical vessel with a stretched sheet of india-rubber as thin as the walls of balloons. Such a surface is quite flat and fairly transparent. If a sponge of liquid air is drawn across the surface, the course is marked by a series of wrinkles, due to the temporary expansion of the rubber caused by the extreme cold. The sheet of rubber being extremely thin, soon regains the ordinary temperature, and the surface then is as flat and tense as before. During the continuous motion of the cotton wool liquid air sponge over the rubber surface, it is followed by wave-like depressions which disappear almost as quickly as they are formed. The elasticity of india-rubber, after cooling to -182°C . and re-heating, seems unimpaired.

Organic substances that only become solid at very low temperatures may be divided into two classes: those which crystallise, and those which form glasses. Thus bisulphide of carbon, tetrachloride of carbon, methyl alcohol, hydride of amyl, all form crystals, whereas ethyl alcohol, amyl alcohol, turpentine, ethyl nitrate, chinoline, picolin, are glass-like. If a few drops of bisulphide of carbon are added to alcohol and the mixture cooled to -180°C ., a white solid emulsion is formed, whereas the addition of tetrachloride of carbon to the alcohol resulted in the production of a clear solid without any separation. In the same way pure methyl alcohol crystallises easily, but the addition of a few drops of ethyl alcohol prevents crystallisation and causes a glass to be formed. Thus the examination of the behaviour of organic bodies at low temperatures may be a fruitful means of organic investigation.

(To be continued.)

Reviews and Notices of Books.

LA VOIX MODIFIÉE PAR LES INHALATIONS. BY DR. A. SANDRAS. Pp. 107. (Paris: G. Masson, 120, Boulevard Saint Germain. 1894.)

In this small book the author records the results of experiments which he was induced to undertake after observing the effect of inhalations of turpentine and other essences on the voice. An introductory chapter is devoted to a detailed explanation of the physiological factors concerned in voice production, and the different theories on the subject that have been advanced from time to time are briefly summarised. The record of experiments follows, the effects of inhalations of alcohol of different strengths and in various combinations being first described. As might be expected the effect diminishes with the strength of alcohol. Petro-

leum, turpentine, wines, etc., are next considered, and the author concludes this section by recommending certain liquids, formulæ for which are given, for the use of tenor and soprano, baritone or mezzo-soprano, and bass singers, respectively. These inhalations consist in each case of turpentine, Norwegian tar, and chloroform, with the addition of pyridine for the first-named class of singers. The rest of the book is occupied with letters from correspondents who describe their experiences in treatment of the voice by inhalations.

THE GALENICAL PREPARATIONS OF THE BRITISH PHARMACOPOEIA. A handbook for medical and pharmaceutical students. By C. O. Hawthorne, M.B. Pp. 118. Price 4s. 6d. (J. and A. Churchill, London. 1895.)

It is agreeable to learn from the preface to this work that the author recognises the fact that the medical student cannot reasonably be expected to be familiar with the commercial qualities of drugs, or with the details of the manufacture of their preparations. Even a knowledge of the nature of medicines and of the proportions of active ingredients they contain is a severe burden to the memory, and one which the author endeavours to lessen by an explanation of principle and careful classification. This endeavour has met with complete success. The classification has been carefully and judiciously accomplished, and the principles which underlie the processes adopted for the various preparations concisely stated. In this way an excellent general view of all the galenicals of the Pharmacopœia is obtained, and the student saved much loss of time. So satisfactory is this portion of the work that it can be strongly recommended to the student of pharmacy as well as the student of medicine, and indeed it should prove of greater value to the former. The book is of convenient size and, especially if interleaved, should prove a handy class-book.

THE LAW OF COPYRIGHT IN DESIGNS. By LEWIS EDMUNDS, D.Sc., LL.B., assisted by T. M. STEVENS, M.A., B.C.L., and MARCUS W. SLADE, B.A. Pp. 291. (London: Sweet and Maxwell, Limited, 3, Chancery Lane. 1895.)

This work is the first one published in recent years that is specially devoted to the law of designs, and is intended to present an exhaustive exposition of the English law of copyright in designs, the text containing all cases relating to designs, reported up to the end of February last. The practice relating to proceedings in the Courts and in the Patent Office is also fully described, and there is an appendix of statutes, rules, and forms, the international convention, etc., etc. Some 20,000 designs are registered annually, and, as pointed out by the author, enormous commercial interests are now largely dependent on the protection afforded by such registration. The subject is therefore of extreme practical importance, and a guide such as the present should prove of very great value to persons interested in the matters of which it treats.

Correspondence.

FOUNDERS OF THE SOCIETY.

Sir.—The President, during his recent comprehensive address, intimated that there might be certain members who are entitled to be considered "founders," but whose names do not appear on the list; furthermore, the President suggested that the Secretary would be glad to know of any such instances. Thereupon I addressed that gentleman, but was informed by him that not having joined the Society until 1842 (the year previous to incorporation), I am excluded. I think, however, I have a claim to be included among the founders of a very important branch at Manchester, where, associated with a few earnest workers, we laboured with patience and perseverance to secure advantages now enjoyed not only by the profession, but by society at large.

It was, sir, I assure you, up-hill work, having to contend with the old well-to-do druggist and his self-sufficiency, the apathy of middle age, and the careless indifference of the young. We met at each other's houses, collated facts, discussed trade interests and improvements in pharmacy, particularly regarding the genuineness or otherwise of drugs. You will not, I hope, think it out of place if the names of those pioneers are mentioned, especially as they have nearly all gone over to the great majority:—James Woolley, Thomas Standing, J. Robertson, W. D. Lynch, Robert Jackson, Wm. S. Brown, Joseph J. Pyne.

The only two survivors are Mr. Wm. Wilkin-son (for many years local secretary) and your present correspondent now in his seventy-seventh year. I cannot recall the memory of those early days without a glow of satisfaction, for the labour was not in vain, the only emulation we had was to succeed in our object; in pursuance of which a room was hired, books supplied, lectures delivered on chemistry and botany. In a short time the craft began to perceive that the few cultured members commanded not merely the confidence of the medical profession, but that it tended to place the pharmacists in a better position regarding business; so in order to participate in the advantage many became converted to the innovation.

We invited Jacob Bell to visit Manchester, and the claims of the Pharmaceutical Society became better known and respected. A meeting (reported in the *PA.J.*, vol. xii., p. 115, July 30, 1852) was convened at the library of the Athenæum, it was attended by probably 100, and a more motley group seldom assembled; they came from remote parts of Lancashire, Cheshire, and the borders of Yorkshire—the town was not so well represented as was expected. The vernacular of Owd'am, Roachda, Bullock's Smithy, Chow Bent, Tilsey Bangs (Tildsley Bank) evidently touched the humour of our apostle, who replied to their intended jokes with such good-natured *sang froid* that all were pleased—joining heartily in the vote of thanks to Mr. Bell by acclamation. After the meeting we adjourned to the Queen's Hotel for luncheon—in every respect a very enjoyable repast, then a quiet smoke. Conversation turned on the injurious effects of phosphorus on the workpeople employed in match making. Learning that several cases had been admitted to the Royal Infirmary, Mr. Bell expressed a wish to investigate what he felt to be a grievous wrong. And much did he commiserate the state of those unfortunate sufferers, expressing a hope that something might be done to obviate the evil. It is remarkable that the most extensive manufacturers of matches in this country, Messrs. Bell and Black and Bryant and May, are members of the Society of Friends. Happily we have not heard much about "Phossey Jaw" of late years.

Kington-on-Thames.

R. GOODWIN MUMBRAY.

Notes and News.

PHOTOGRAPHY IN NATURAL COLOURS.—Amongst the most interesting exhibits at the conversazione of the Royal Society, held last week, were the photographs in natural colours, projected by means of a lantern by Dr. Joly, of Dublin. His method of working is as follows:—A sheet of glass is ruled with fine lines of transparent colours, red, green, and violet alternately, about three or four hundred to the inch.

A screen is placed before the sensitive plate in the camera, and on development a negative bearing the image in lines is obtained. From such a negative a positive or transparency is obtained, and a similarly ruled screen being placed in contact with the transparency, the result is a photograph in natural colours. The results thus obtained are simply wonderful in their faithfulness of rendering, and the only drawback is that at present the results must be viewed as transparencies. Portraits, flowers, water colours, etc., were thus projected, and attracted considerable attention.

SOCIETY OF CHEMICAL INDUSTRY.—The annual meeting of this Society will this year be held at Leeds on July 17, 18, and 19. The council meeting takes place at the Yorkshire College on the morning of the first day, and will be followed by the general meeting. Luncheon is to be served at the College, and in the afternoon visits will be made to various workshops, factories, and electrical current-generating stations. In the evening the members are invited to a reception given by the Mayor (Ald. Gilston). The second day will be taken up in visits to various manufacturing concerns in the Leeds and Bradford districts, four or five different rounds of inspection being arranged. On the last day there will be an excursion to Wharfedale, and a smoking concert in the evening at the Priestley Club. The local treasurer is Prof. A. Smithells, B.Sc., and the local hon. secretaries, Mr. H. R. Proctor and Mr. A. C. Wright, B.A., B.Sc., all of the Yorkshire College.

PHARMACEUTICAL REPORTS.—According to the *Daily News*, the Pharmaceutical Society of Berlin intends to publish regularly reports on botanical, chemical, and pharmacological discoveries concerning poisonous and healing plants all over the world. The reports will be published at stated times, and it is hoped by this undertaking not only to furnish individual students with information collected into a brief compass, but also to encourage further inquiries by scientific men.

THE NEW GAS FROM CLÈVEITE.—Professors Runge and Paschen do not agree with the conclusion that the new gas from clèveite is the same as solar helium, since they find the line of the new gas to be double, whereas D_3 is single, as recently confirmed by Huggins. The true helium line apparently falls between the two lines of the clèveite gas, and Huggins (*Chem. News*) points out that Bèlopol'sky occasionally saw a pair of dark terrestrial lines at the sides of the bright helium line, their wave-lengths agreeing to some extent with Runge's measures.

QUEER PHYSIC INDEED.—The *Evening News and Post* has apparently recently purchased a second-hand book of general information, and one of its junior staff seems to have taken advantage of the opportunity thus afforded him of graduating as a professor of things in general. Hence the strange outburst on "Queer Physic" that startled the long-suffering inhabitants of the Metropolis a few days ago. With more or less accuracy, pepsin is described as the dried inner lining of the stomach of a calf or pig; jellies and blanc manges are stated to be composed of the entrails of fish, coloured with the juice of insects; and the act of imbibing a draught of magnesia is said to be equivalent to swallowing building stone (dolomite). But it is not until the writer is nearing the limits of his space that he thoroughly warms to his subject. Then, however, the amazed reader learns that syrup of squills is extracted from the sea onion, and that from the sea-shore comes a very effective blood-mixture, prepared in a secret way, "by burning seaweed and distilling the resultant ash with manganese iodine combined with iodide of potash." After this brilliant effort, no one can be surprised at the information that prussic acid is used "in a mild way" to flavour sweets, or that the pure acid is such a deadly poison that, "supposing a small bottle of it were broken in the centre of a crowded theatre, only those nearest the door would escape with their lives."

COCAINE POISONING.—A case of cocaine poisoning was recently reported before the Hamburg Medical Society by Dr. Scheele. Two cubic centimetres of a 10 per cent. solution of cocaine were injected into the urethra of a young man, the subject of a urethral stricture. Some minutes afterwards cyanosis, dilation of the pupils, and profound coma came on, followed by trismus and tetanic convulsion. No effect was produced by ether, camphor, or inhalation of amyl nitrite. Oxygen and artificial respiration were resorted to, and a good effect was produced by the intravenous injection of 650 grammes of sodium chloride solution. The patient was quite unconscious for two hours and a quarter, and was not perfectly conscious until three hours had elapsed, when the only symptom was a slight right facial paresis; this disappeared the next day.

FIVE CASES OF POISONING WITH ARSENIURETTED HYDROGEN.—In a recent number of the *Medical Chronicle*, Drs. Mann and Clegg record five cases of this unusual form of poisoning arising from the use of hydrochloric acid containing a large amount of arsenic in the production of zinc chloride in an industrial operation. Of the five cases two ended fatally.

THE DENSITY OF HELIUM.—Professor Clève announces that M. Langlet has determined the density of helium extracted from clèveite as 0.139 (air = 1), or 2.02 (hydrogen = 1), this being decidedly lower than the density found by Professor Ramsay. The editor of the *Chemical News* observes, however, that Professor Ramsay has recently obtained helium from brügerite, of as low a density as 2.18.

THE SPECTROSCOPE AND PHOTOGRAPHY.—Dr. Huggins, in his recent lectures at the Royal Institution paid a high compliment to photography as applied to the study of star spectra, and described in detail Professor Keeler's discovery of the non-continuous character of Saturn's rings, which was determined by examining negatives obtained in the spectroscope. These showed the displacement of the lines due to the motion of the small bodies composing the rings. Professor Norman Lockyer also exhibited at the Royal Society's *Conversazione* negatives of star spectra, which exhibited the now famous helium and argon lines.

WALNUT SHELLS FOR CINNAMON.—Dyer and Gilbard, in a paper published in the *Analyst*, refer to a statement that a firm of confectioners abroad, which does a heavy trade in walnuts, sold their walnut shells in London for more money than they gave for the whole walnuts. It was alleged that the shells were ground and used for adulterating cinnamon, and examination of the powdered shells was therefore made with a view to their identification in case of need. As a result it is stated that the powdered walnut shells can be detected when mixed with ground cinnamon by careful examination with the microscope, and data are also given for analytical determinations.

BRASLEY'S 'DRUGGISTS GENERAL RECEIPT BOOK.'—A tenth edition of this useful little work has just been published by Messrs. J. and A. Churchill, and contains a large amount of new matter, more especially in connection with the articles on Urinary Analysis, Photography, Microscopic Formulæ, etc. The book is an old favourite with chemists and druggists, and in its revised form is likely to be as popular as ever. This edition contains five hundred and thirty-eight pages, and is published at 6s. 6d.

PRESENTATION TO MR. A. E. FLETCHER.—An interesting event took place on the 31st ult. in connection with the retirement of Mr. Alfred E. Fletcher, F.I.C., from the Chief Inspectorship of Alkali, etc., Works, a post which he had held for eleven years. Mr. Fletcher was one of the original inspectors appointed under the first Alkali Act of 1863, being the only one remaining in office of the original five officials then appointed. Mr. Fletcher was entertained by the staff at dinner at the Hotel Privitali, when presentation was made to him by his late colleagues of a silver Monteith bowl with a suitable inscription. Mr. R. Forbes Carpenter, F.I.C., has been appointed by the Local Government Board to succeed Mr. Fletcher as Chief Inspector. Mr. Carpenter has been in charge of the East Lancashire and Yorkshire District.

POISONING BY CARBOLIC ACID.—Suicide by drinking carbolie acid appears to be greatly on the increase at present. Every week the Journal records such cases, and it is stated that within the last fortnight the Manchester deputy coroner has held inquests on no fewer than seven persons who had committed suicide by taking carbolie acid. Since the beginning of the year about twenty similar cases have occurred in the Manchester district, so that the record for the past fortnight is distinctly abnormal.

Parliamentary News.

SALE OF FOOD AND DRUGS ACTS.

Evidence was given before the Select Committee of the House of Commons on food products and adulteration, on Tuesday last, by Mr. R. A. Robinson, Chemist and Druggist, as Chairman of the Special Purposes Committee of the Vestry of St. Mary Abbots, Kensington, who stated that the vestry had always appreciated the importance of an adequate application of the provisions of the Act dealing with adulteration, and had also had due regard to the advantage of securing the services of a Fellow of the Institute of Chemistry as analyst.

It was considered desirable to amend the Acts so as to bring manufacturers and wholesale dealers within their scope. At a conference held last year at which the vestry was represented, resolutions were passed urging that the powers of inspectors under the Acts should be extended, that retailers who could prove they had sold articles exactly as supplied to them should be exempted from penalties, whilst the manufacturer or wholesale dealer should be liable to be summarily convicted; that the labels on articles should describe the contents of the package and state the proportions if a mixture, except in the case of compounded drugs; and that a Board of Reference should have power to vary the standards for milk and similar products during exceptional seasons. All imported food-stuffs and drugs should be examined and analysed by officers of the Sanitary Authority; and there should be a minimum penalty of 40s. for all offences under the Acts, with liability to a double penalty and imprisonment for subsequent offences.

The Kensington Vestry concurred in the views expressed in these resolutions, and whilst not in any way desiring to question the competency or impartiality of the Somerset House authorities, was strongly of opinion that the Board of Reference should possess the confidence of public analysts and of the general public. It was proposed, therefore, that the Board of Reference should consist of an officer of the Inland Revenue, and nominees of the General Medical Council, the Society of Public Analysts, the Pharmaceutical Society, and the Board of Agriculture. Under the direction of the Local Government Board the new authority should set forth definitions and fix limits of standards of quality and purity, besides laying down general rules for the administration of the Acts.

Mr. Robinson further suggested for the consideration of the Committee that, in addition to articles used for food and drink, any article intended to enter into, or be used in the preparation of human food, should be included in the application of the Acts.

English News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

THE INVISIBLE SPECTRUM.—Dr. Huggins, in concluding his spectroscopic lectures at the Royal Institution, alluded to the wonderful advances recently made in ascertaining the character of the invisible parts of the solar spectrum. The rays of the sun when received through the prism of the spectroscope appear to the eye as a ribbon of rainbow coloured light, across which are drawn a multitude of fine black lines representing the screening or absorp-

tive effect of the solar atmosphere. From the character and position of these lines, the spectroscopic chemist is able to say what chemical elements in the gaseous atmosphere of the sun are causing this absorption. But this visible portion of the spectrum compasses but a fraction of the total rays that are speeding to us from the great fountain of energy upon which the life of the earth and its fellow planets depends. Beyond the violet end of the spectrum there is a whole gamut of invisible rays which only revealed themselves by their effect in promoting chemical action. Similarly beyond the other end of the visible scale—the deep red—there is a gamut of invisible or dark rays which are only perceived by their heating effects.

Some idea of the importance of the "ultra-red" may be gathered from the fact that it has been traced to a distance nearly ten times as long as the whole range of the visible or light-giving region of the spectrum. To learn the character of these mysterious dark rays, then, it is clearly necessary for science to fit itself with some new sort of eyes that can see what ordinary eyes cannot—namely, heat rays and chemical rays. The photographic plate has answered admirably as an eye for the chemical rays, and brought out some wonderful facts. But with the invisible heat rays the problem was more difficult. Something in the nature of an extremely delicate thermometer is here required which will pick out all the fine absorption lines as colder spots in the spectrum. The beautiful instrument known as the bolometer has recently been used by Professor Langley in feeling for these absorption lines, which being regions from which the rays are stopped out are, of course, colder than the remainder of the spectrum. This bolometer, like all the finest applications of science, is an extremely simple thing. It is a strip of fine wire, through which a feeble current of electricity is always flowing. This wire is slowly passed along the invisible gamut of the spectrum, and as soon as it comes to one of the absorption lines the spot is shown by a minute fall of temperature in the wire. This has an instantaneous effect on the flow of the electrical current. More current will pass through a cool wire than a warmer one, and the alteration is promptly shown by a delicate mirror galvanometer, which flashes its mimic signals on to a slowly revolving photographic ribbon. In this way Professor Langley has been able to pick out and locate hundreds of dark absorption lines in the great invisible spectrum which lies beyond the red. Not only is the absorption of rays by the solar atmosphere shown by this method, but the absorption lines of the earth's atmosphere are equally apparent.

Dr. Huggins anticipates that the meteorologist will soon be applying the system to weather forecasts. Some final remarks of the lecturer in regard to the photography of the corona of the sun are of interest as indicating the enormous energy which is at work in the solar furnaces. He stated that fiery spurts of calcium vapour have been photographed, extending in fantastic shapes to a distance of 280,000 miles from the sun's surface, and travelling outwards at a speed of something like 30,000 to 40,000 miles an hour.

RESEARCH SCHOLARSHIPS AT MASON COLLEGE.—Six scholarships for research, each of the value of \$100 a year, have been founded at Mason College, Birmingham, by the late T. Aubrey Bowen, of Melbourne, Australia. Three of these, to be called Priestley scholarships, are for advanced study in chemistry, two are for engineering, and one for metallurgy. In the selection of candidates, though outside students are eligible, a preference will be given to those who have already studied at Mason College.

Scotch News.

A COD-LIVER OIL EMULSION CASE.—In the Edinburgh Sheriff Court, on Monday, Sheriff Rutherford heard proof in an action by David Middleton, chemist and druggist, 85, Bruntsfield Place, Edinburgh, against James M. Wilson and Co., chemists, 16, Leven Street, Edinburgh, and Patrick W. Wilson, chemist, the sole partner of the firm. Plaintiff sued for £50 in name of damages and also to have the defendant interdicted by himself, or by others acting on his behalf, from dispensing prescriptions containing, as part of the contents thereof, cod-liver oil emulsion which was not Middleton's, and representing it as his emulsion. The defendants denied that they had dispensed in any prescription a cod-liver oil emulsion which was not the plaintiff's, representing it as his, and stated that on the occasion libelled they told the party to whom the emulsion was supplied that they had not Middleton's, and obtained sanction to substitute their own.

David Middleton, the plaintiff, in his evidence stated that he had been connected with the Pharmaceutical Society since 1878, and that he had been connected with the trade for twenty years. Nearly every chemist had special preparations of particular medicines, and they endeavoured to find favour for them with the medical profession, with a view to their being prescribed by them. It was an every-day occurrence for chemists to dispense preparations prepared by other chemists, and if they had not got it in stock they sent out for it. In such a case the patient had to wait for it till it was procured. Cod-liver oil emulsion was not in the B.P., and each chemist prepared it in his own particular way. Witness had bestowed some time and attention in preparing such an emulsion, and several doctors in his vicinity had prescribed it, and he had dispensed it himself, and supplied it to other chemists for the same purpose. He mentioned five Edinburgh chemists and the Scottish Drug Depot as having got supplies, and he had had orders from Glasgow and the South of England. On March 30, last, Dr. Veitch came into his shop and handed him two bottles, and asked if they contained his emulsion. Previous to that he had suspected that the sale of his emulsion was suffering from cases of substitution, but he did not suspect the defendants. The bottles bore the defendants' labels. Witness stated that the emulsion was not his. He did not know the defendants personally, but he knew their place of business, and that they had a special preparation of their own. Dr. Veitch said he had prescribed witness's emulsion, and that the preparation in the bottles had been supplied. He seemed to be annoyed. Dr. Veitch and he went to the defendants' shop and saw Mr. Patrick Wilson. Dr. Veitch showed the defendant the prescriptions and the bottles, and asked if that was Middleton's cod-liver oil emulsion. Defendant said it was not Middleton's, that the prescription was handed in late in the evening, and that as he had not Middleton's emulsion, and as Middleton's shut at 8 o'clock, he told the boy that he would substitute his own. Witness broke in and said he was Middleton, and that his shop did not shut till half-past eight. Witness then said to the defendant that if he apologised to Dr. Veitch and himself and sent fresh bottles of the emulsion to the patients there would be no more about it. The defendant at first demurred, but ultimately agreed to do so. He promised to send the apology that afternoon along with an order for witness's emulsion, to enable him to dispense the prescriptions properly. The order came, but there was no apology sent on that afternoon or since, and he gave the matter into the hands of his solicitor. A chemist was not allowed to make substitution of one ingredient for another in a prescription without the authority of the doctor. Shown an

entry in defendants' prescription book, witness said it corresponded with Dr. Veitch's prescription, and there was also along with it the words "give Wilson's." Shown another prescription in defendants' prescription book, it was for Baidon's extract of sagra. On the margin opposite there was a formula for a preparation which seemed to have been substituted. He did not say he had suffered pecuniary loss, but he had raised this case for his own protection.

Cross-examined: His emulsion was well known in the market, and he had a large sale for it. Dr. Veitch knew the ingredients of it. He thought it quite fair that other chemists should have to go to him for his emulsion if it was prescribed. He was not aware that it used to be the custom for a doctor to prescribe ingredients of a particular medicine instead of prescribing it by name. The consent of the doctor must be obtained before a prescription could be altered. The chemist should follow the prescription to the letter. He would not consult the customer in a matter of changing a prescription. If he wished to change it he must communicate with the doctor. It was a disputed point whether it was the doctor or the customer that was asking for the medicine prescribed. When Dr. Veitch told him about the case he did not express himself as dissatisfied with the condition of the patient. He could not estimate the damage by substitution, but since he took proceedings his sales had gone up considerably.

The Sheriff: It had been a good advertisement.

Cross-examination continued: Dr. Veitch had no interest whatever in this emulsion, pecuniary or otherwise. It was unknown in Edinburgh for chemists and doctors to have an arrangement for the sale of special preparations. He did not know what was done in the provinces.

Dr. Alex. Veitch said he qualified as a medical practitioner in 1890. He was acquainted with the plaintiff's emulsion.

By the Sheriff: Chemists submitted their own preparations to medical men with a view to their prescribing them to their patients.

Examination continued: Witness had tried this emulsion and found that it had beneficial results, and he had heard other medical men speak of it in terms of approval. He prescribed it for a patient in March last who was recovering from influenza, and later for another patient in the same house. Witness corroborated the plaintiff's version of the interview with the defendant.

Cross-examined: It was perfectly fair for a doctor to prescribe a remedy, although it might be little known, and there was no difficulty in the chemist complying with the prescription. Even if he were to write out the formula instead of the name of the special preparation he would have no guarantee that the person would get fresh cod-liver oil. Middleton having brought out an admirable formula, he thought it only right and fair that he should have the benefit of his skill. Doctors had no *quid pro quo* for advertising special preparations.

Mrs. Scott deposed to having taken the prescription for her sister's medicine when it was first made out by Dr. Veitch to the defendants. She went late in the afternoon or evening for it. She was told by the chemist that it would be sent round—that it was a specially prepared thing. She asked the gentleman what was in it, and he said it would not do to tell tales out of school. He did not say anything about not having Middleton's emulsion, or that he would substitute his own. The bottle was re-filled, but she did not remember whether she got it herself or not. When her lodger, Charles Seggie, was ordered the emulsion she sent a boy for it.

Isa. Duncan and Chas. Seggie, the patients, gave corroborative evidence.

James Steen, who was sent for the emulsion for Seggie, said the druggist did not say anything about not having Middleton's emulsion.

Peter Boa, George Street, Edinburgh, said he was a member of the Pharmaceutical Society, Chairman of the Edinburgh District Chemists' Association, and a member of the Board of Examiners for the Pharmaceutical Society of Great Britain. He gave evidence as to the custom of the trade in dispensing specific medicines. The chemist had to conform strictly to the prescription, and he had no discretion in altering it. If they had not the special preparation in stock they sent out for it. It was quite a common thing to have to send to London for such preparations. The idea of recommending one's own preparation instead of one which they had not in stock was (not to be entertained at all. He had a preparation, an emulsion, which was in frequent requisition, and he had requisitions for others, and he supplied the special preparation in every case.

Cross-examined: He did not think it was the general custom to sell one's own preparation instead of another's. He would think it a shady practice for a chemist to sell his own fruit-salt, say, for any other fruit-salt. There might be a great deal of difference between an emulsion produced by one manufacturer and another. He would decline to be a party to substitution without consulting the prescriber. In regard to distilled water, a chemist might have some discretion.

John Alex. Forret, chemist, Brougham Place, gave corroborative evidence as to the custom of the trade.

Mr. R. H. Wood, plaintiff's agent, produced letters to show that every means had been employed to endeavour to obtain an apology from the defendants before bringing the case, and this closed the plaintiff's evidence.

Mr. G. H. Laird, chemist, Queensberry Street, was the first witness for the defence. He said he had been twenty-seven years in practice. He never heard of Middleton's emulsion till this case came up. His evidence as to the custom in the trade was similar to that of Messrs. Boa and Forret. He would not take it upon him to alter a doctor's prescription, but if a customer came in and asked for a particular preparation and he had not got it in stock, he would feel quite justified in offering one of his own if he had it. If he got a prescription for Middleton's emulsion he would be responsible to the doctor and the patient for Middleton's emulsion being supplied.

Mr. Heron, a partner of Messrs. Duncan and Flockhart, said he had been thirty-eight years in practice as a chemist. He was held as concurring with Mr. Laird's evidence.

The case was then adjourned till Wednesday, when the last witness will be called.

The taking of proof was resumed on Wednesday, June 19, when Patrick W. Wilson, the defendant, said he was 24 years of age, and assisted in the chemist and druggist business at 16, Leven Street. The business had been carried on by his father, and he produced his father's testamentary deed, which was confirmed by his mother. He always kept a qualified assistant in the shop. He was not qualified himself. He received a salary from his mother. He remembered a boy coming with a prescription for Middleton's cod-liver oil emulsion on Saturday night, March 16, after nine o'clock. He said he did not know Middleton's emulsion, and he had looked in the lists and did not see it on any of them. He had not heard of Middleton's emulsion before. He asked the boy if he wanted it that evening, and he said he did, and witness said the only thing he could do was to make up an emulsion and send it round to him. The boy said "all right," and he did

so. The entry in his day book was for that date. Mrs. Scott came to get the bottle refilled on March 26, and on March 28, the boy came again for the emulsion for Mr. Seggie. He again told the boy that he did not know whose emulsion this was, and asked him if he would take the same as before, and he said he would. On March 30 Dr. Veitch and the plaintiff came into his shop. Witness told them he had never heard of Middleton's emulsion. Dr. Veitch said he had no right to give any other emulsion than the one he ordered, and that he must apologise to Mr. Middleton, and send two bottles of emulsion to his patients. Witness said he was very sorry if he had displeased them in any way, and he sent the two bottles of emulsion to the patients. He did not send an apology because he did not know what he was to apologise for. In acting as he did he acted on what he understood to be the custom of chemists in regard to prescriptions for specific articles. He did not think he was acting wrongly in regard to a medicine of which he knew nothing. As a matter of fact, in the generality of cases he would not think of suggesting the substitution of one thing for another. He had other emulsions in stock which were well known, and if any of them had been asked for they would have been supplied. When the bottle was refilled he supplied the same emulsion as on the first occasion.

Cross-examined, witness said he had served an apprenticeship as a druggist, but was not a qualified chemist. There were others interested in his father's will besides his mother and himself, and they had all got their share. He knew that Mr. Middleton had a shop not far from his own. He disagreed with Mr. Laird's and Mr. Heron's evidence as to the custom of the trade. It was his custom to be very careful and very minute in dispensing prescriptions. His practice was to comply strictly with a prescription if he knew the preparation. If he did not give what was prescribed he entered in his day book that he had given something else, so that they might know what to give on another occasion. On the occasion referred to witness dispensed the emulsion because his assistant was sick. Mrs. Scott did not come for the emulsion first, she called on the following day, Sunday, for a mixture. When she called for the second supply of the emulsion she asked what it was composed of, and he said it would not do to tell tales out of school. He did not tell her it was a specially prepared kind of emulsion, or that he would require to send for it. He did not think it necessary to tell Mrs. Scott that he had not supplied Middleton's emulsion. It was between seven and half-past nine in the evening when the boy came the second time and not during the day. It did not strike him that the emulsion was the plaintiff's. His practice in the case of a special preparation being prescribed that he did not know, was to send to the wholesale houses and ask for it, and he did not do that in this case because it was too late, and those houses would be shut. If he had known it was Mr. Middleton's he would have sent for it. He was never asked for it before, and had not been asked for it since.

His Lordship then heard counsel on the evidence and reserved judgment.—Counsel for plaintiff, Mr. Wilton; agent, R. H. Wood, S.S.C.—Counsel for defendant, Mr. Craig; agent, Peter Campbell, S.S.C.

ANTE-CANCER SERUM.—Bowns and Petersen (*Deutsch. med. Wochenschr.*) have failed to obtain any success with ante-cancer serum of Emmerich and Scholl; the only effects observable were prejudicial ones.

Irish News.

ILLEGAL SALE OF ETHER.—At the petty sessions at Cookstown on June 14, a grocer named John Early was charged with the sale of sulphuric ether, he not being a registered druggist, and on a second summons with selling ether without a label. Sulphuric ether was scheduled as a poison some years ago, owing to its extensive use as an intoxicant. The defendant was fined £5 and costs.

Proceedings under the Pharmacy Act.

The adjourned hearing of the case of the Pharmaceutical Society *v.* Hills came before his Honour Judge Bacon, at the Bloomsbury County Court, on Thursday last. The case was last before the court on May 23, when it was stated that Mrs. Lavinia Hills carried on business at 91, Lower Marsh, Lambeth. The offence under the Pharmacy Act for which the Society sought to recover one penalty of £5 was the sale of a bottle of Powell's balsam of aniseed on February 25, at the defendant's shop, she not being a qualified person under the Act.

Mr. Grey (instructed by Messrs. Flux and Co.) said the case stood adjourned until the present date in order to give the defendant an opportunity of proving that her late husband was a registered chemist and druggist. The other facts of the case were admitted.

Mrs. Lavinia Hills, in reply to his Honour, said her husband had been in business for thirty years, but she could not say that he was a qualified chemist.

A man rose at the back of the court and stated that he managed the defendant's business, and that he was a qualified man.

His Honour said that was not sufficient to enable a woman to carry on a business for the sale of poisons. There would be judgment for £5 and costs, and a certificate for counsel.

Poisoning Cases and Inquests.

Carbolic Acid.—Sarah Jane Walker, aged 33, poisoned her daughter aged 8, on Monday, June 10, at Leeds, by carbolic acid, and afterwards committed suicide by taking the same liquid. Mrs. Walker had suffered from mental depression.

Strychnine.—Charles Alfred Williams, aged 21, of Notting Hill, died on Monday, June 10, in Bushey Park, from the effects of strychnine, self-administered. Verdict: "Suicide while temporarily insane."

Carbolic Acid.—Sarah Gibson, died on Saturday, June 8, at the Manchester Infirmary, from the effects of carbolic acid, self-administered. Verdict: "Deceased committed suicide whilst drunk."

Carbolic Acid.—Jane Sharpling, died on Friday, June 7, in the St. Pancras Dispensary, from the effects of carbolic acid, self-administered. Verdict: "Suicide while of unsound mind."

Carbolic Acid.—Frank Seely, aged 31, died on Saturday, June 1, in the General Hospital, Retford, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst in an unsound state of mind."

Laudanum.—William Bollin, aged 67, died on Tuesday, June 4, at Ramsay, from the effects of laudanum, self-administered. Verdict: "Deceased poisoned himself by taking laudanum whilst of unsound mind."

Laudanum.—John Dakin, aged about 50, died on Wednesday, June 12, at Derby, from the effects of laudanum, self-administered.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[From the *Illustrated Official Journal (Patents)*.]

- No. 10,168.—Improvements in and relating to means for carrying and exposing sensitive photographic dry plates, films, and the like. May 23.
 No. 10,219.—Improved truss. May 23.
 No. 10,227.—An improved surgical truss. May 23.
 No. 10,294.—Improvements in sulphur tablets and the like. May 24.
 No. 10,297.—Improved device for extracting corks from bottles. May 24.
 No. 10,329.—Stopper for glass and other bottles. May 27.
 No. 10,412.—An improved air-tight cover for jars, bottles, and the like. May 27.
 No. 10,528.—Combination tooth-brush and holder. May 28.
 No. 10,657.—Improvements in compounds for use in pyrotechny and photography. May 29.
 No. 10,658.—An improved scrubber for laboratory vessels, applicable also for other purposes. May 29.
 No. 10,662.—Improvements in shoulder pads. May 29.
 No. 10,666.—Improvements in the manufacture of stripping films for photographic purposes. May 29.
 No. 10,690.—Improvements in leg-guards, gloves, abdominal, etc., protectors. May 30.
 No. 10,700.—An improved tonic wine. May 30.
 No. 10,725.—A method of developing and fixing photographic negatives or prints by means of rollers, cylinders, or pads. May 30.
 No. 10,727.—An improved embrocation. May 30.
 No. 10,939.—Improvements in etuis for medical thermometers. June 1.
 No. 11,041.—Improved spray-producing device. June 4.
 No. 11,079.—Improvements in bottle stands, frames, or cases. June 5.
 No. 11,083.—Improved filter apparatus for filtering oils and the like. June 5.
 No. 11,099.—Improved hygienic pad and belt for women. June 5.
 No. 11,106.—The patent medicinal biscuits or friends of health. June 5.
 No. 11,215.—A new or improved device for maintaining the level of liquid in vessels and for measuring or delivering measured quantities thereof. June 7.
 No. 11,238.—An improvement in pots for making infusions and decoctions. June 7.

PATENTS PUBLISHED JUNE 1.

Purifying cotton-seed oil (Aspinall, F. B.).—The warm crude oil is agitated with a solution of common salt and, after a time, with a solution of caustic soda. When a test indicates that sufficient action has occurred, agitation is stopped, and warm or cold water is sprinkled over the top. The water carries down all colouring matters and impurities. The inventor indicates the best temperatures and strengths of reagents to be used, and states that practically no saponification need occur. No. 11,324 of 1894.

Organic Iodides for Pharmaceutical Use (Newton H. E., communicated from the Farbenfabriken, formerly Frederick Bayer and Co.).—Refers to the continuation of work on iodides of phenols, etc., described in patents No. 5,079 of 1889, 18,021 of 1890, and 7,026 of 1891, and relates to the preparation of new iodine compounds for use in pharmacy, by acting with iodine or substances yielding iodine, upon the hydroxy derivatives of tri-phenylmethane or of its derivatives, or upon secondary aromatic amines or their derivatives. The compounds produced are strongly acid, readily soluble in alkalis and easily obtained in a state of purity. The inventors describe the preparation and properties of tri-iodide of aurine,

tri-iodide of rosolic acid, tetra-iodide of phenolphthalein (both the yellow and white varieties), di-iodide of carbasol, di-iodide of diphenylamine, nitro-di-iodide of di-phenylamine, and aceto-di-iodide of di-phenylamine. No. 12,987 of 1894.

Ferrocyanides (Imray, O., communicated from Goerlich and Wichmann).—An alkaline sulpho-cyanide is fused with iron as usual, but instead of treating the product at once with water to dissolve out the ferrocyanide, as is commonly done, the inventors first expose it "to the action of air containing its usual proportion of carbonic anhydride and moistened by steam or otherwise." The whole of the sulphur is thus liberated, and may be suitably extracted after the ferrocyanide, etc., have been removed by lixiviation. No. 13,260 of 1894.

Clinical thermometers (Peroni, L.).—Relates to a form in which an outer glass case encloses the whole of the thermometer, except the bulb. The process of preparing the instrument from the ordinary capillary and quill tubing is fully described. No. 13,590 of 1894.

Potassium chlorate (Bayer, K. J.).—In preparing this compound by the ordinary method, about four-fifths of the chlorine used is lost as calcium chloride. The inventor replaces the lime ordinarily used, by zinc oxide free from iron and manganese, the bye-product (zinc chloride) being of commercial value. No. 17,978 of 1894.

Bottle-stopper (Rosenfeld, J., and Mackey, S.W.).—The bottle is closed by a cap which fits over its mouth, and has an indiarubber or other packing to hermetically seal it. The cap is carried by a wire stirrup so secured to a pair of spring-wire arms fixed on the bottle-neck as to hold it securely until pushed aside. No. 2,000 of 1895.

Bottle-stopper (Stein, E. G. H., and Foster, C.).—Relates to medicine and other bottles, and comprises an arrangement of ball valve fitted in the bottle-neck and permitting discharge of the contents while preventing the insertion of any liquid. No. 5,763 of 1895.

Purifying metals (Reichwald, A., communicated from Fried. Krupp).—The small amount of oxygen contained in iron, steel, and other metals and alloys is removed by adding, during or before the metal is poured after fusion, some metal or non-metal having a greater affinity for oxygen than has the metal treated. The injurious trace of oxygen is thus carried into the slag. The inventor describes several materials which may be used, but prefers to use at least two metals in conjunction. He mentions as the best for steel castings, an alloy of five per cent. aluminium, ten per cent. manganese, ten per cent. silicon, and seventy-five per cent. of iron. No. 6,323 of 1895.

Ambulance (Hayward, W. G.).—A portable ambulance is described having the two side bars hinged to fold at the middle, the cross bars which connect them and are pivoted to them being also hinged to fold in the middle. Removable flexible canes or rods are supplied to support a covering. No. 6,749 of 1895.

Liniment (Phillips, J. I.).—A composition for application to burns, scalds, and general skin complaints, is prepared by mixing in a stated manner, linseed oil, limewater, turpentine, and "paraffin." The inventor does not state whether solid paraffin is intended. No. 6,887 of 1895.

Pads for intertrigo and hemorrhoids (Blumenthal, E.).—To prevent the formation of sores from riding, etc., and to relieve hemorrhoids, pads are prepared of a shape corresponding with the space to be filled up at or near the anus, etc. The pads are treated with a composition of "hart's tallow," salicylic acid, boric acid, and cocaine, on the parts which touch the flesh. The composition is preferably applied as spray while melted. No. 7298 of 1895.

New Remedies.

[The notes given under this heading, for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

SULPHANILIC ACID AND SODIUM SULPHANILATE IN CORYZA.—Sulphanilic acid has previously been recommended in iodism, as it converts the nitrites formed in the saliva and nasal mucus into indifferent di-azo bodies. In the *Correspondenzbl. f. Schweiz. Aerzte*, 1894, No. 7, Valentin recommends this remedy further as an excellent means for removing certain symptoms of acute catarrhs. The inflammation and swelling of the nostrils and the profuse discharge caused by acute coryza are all greatly ameliorated, or will even cease altogether in a few hours through the use of sulphanilic acid. It is, however, less effective in acute laryngitis and in otitis media; generally in the latter case it only relieves the pain. The influence effected on catarrhic symptoms are not lasting, so that doses of 2 to 4 grammes must be repeated every twenty-four to forty-eight hours. The remedy is best given according to the following formula:—

R. Acidi sulfanilici cryst..... 10 parts.
Aque destillate 200 "
Natri bicarbonici..... 8½ "
D.—Two to three tablespoonfuls twice daily, or else give simply a solution of salt.
R. Natri sulfanilici puriss. 14 parts.
solve in
Aque feniculi 200 "
D.—Three tablespoonfuls to be taken twice every day (*Journ. d. Pharm., f. Els. Lothr.*, 1895, 154).

ETHYLEN-ETHENYL-DIAMIN (LYSIDIN).—This body was first obtained by A. W. Hoffmann, in 1888, and lately Ladenburg has prepared it by another method, and recommends it for medicinal use on account of its beneficial effect in removing uric acid from the system. He calls it "Lysidin" and recommends it as a substitute for piperazin in uric acid diathesis. Lysidin is a very hygroscopic, reddish-white, crystalline substance, and has a peculiar smell resembling hemlock. It is easily soluble, and has therefore been brought into the market in a 50 per cent. aqueous solution. E. Grawitz has employed lysidin in a severe case of arthritis urica which took a typically chronic course, with the result that the symptoms of the malady were favourably influenced. The medicament is taken in 2-10 gramme doses of the 50 per cent. solution mixed with a glassful of aerated water. Disquieting effects on other parts of the system were not noticed even after the medicine had been taken for a long period (*Journ. f. Els. Lothr.*, No. 5, 1895, p. 155).

PAPAIN IN COMBINATION IN PILL FORM.—Writing to the *Lancet* of May 4, Dr. Guthrie Rankin advocates the administration of papain in the pilular form combined with iron, and gives as a typical pill for treatment in atonic dyspepsia:—Ferri sulph., papain Finkler, aa gr. i.; ext. cannab. ind., ext. nucis vom., aa gr. ½; ext. rhei, gr. ½; ft. pil.

THYMOL IN THE TREATMENT OF SENSITIVE DENTINE.—In deep-seated caries with great sensitiveness of the dentine, Dr. Kirk fills the cavity temporarily with gutta-percha, touching the mass before insertion with thymol crystals, which will, in addition to exerting an antiseptic action, obtund the sensitiveness of the dentine (*Journ. Brit. Dent. Assoc.*, xvi., 296).

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

ELECTRO-COPPERING.

[891.] The solutions for electro-coppering should be worked hot (about 130° F.) with an energetic current, and the cyanide used should not contain less than 75 per cent. real cyanide. The following solution is recommended in Watt's 'Electro Deposition,' which may profitably be consulted for further information:—Dissolve copper sulphate, 8 ozs. in hot water, 1 qt. When cold add liquid ammonia (0.880), with constant stirring until precipitate at first formed becomes redissolved, then dilute solution with cold water, 1 qt. Next, add gradually solution of potassium cyanide, 1½ lb., in water 2 qts., constantly stirring until blue colour disappears, when remainder may be added bodily. After resting a few hours, the clear liquid may be decanted into the depositing vessel, and is then ready for use. Copper acetate or chloride, preferably the latter, may replace the sulphate.

DISPENSING GLYCEROPHOSPHATES.

[892.] The following formula is strongly recommended by Dr. Robin (*Bull. Gén. de Thérap.*, cxxviii., 441):—Glycerophosphate of calcium, 6 grammes; glycerophosphates of sodium, potassium, and magnesium, of each 2 grammes; glycerophosphate of iron, 1 gramme; tincture of *Ignatia amara*, 80 minims; pepsin, 3 grammes; maltine, 1 gramme; tincture of kola, 10 grammes; syrup of cherries up to 200 grammes. A tablespoonful to be taken in the middle of luncheon or dinner. This syrup requires skilful preparation; it should be of a bright cherry red colour, and free from deposit. For it may be substituted the following cachets:—Glycerophosphate of lime, 30 centigrammes; glycerophosphates of sodium, potassium, and magnesium, each 10 centigrammes; glycerophosphate of iron, 5 centigrammes; powdered *Ignatia amara*, 3 centigrammes; pepsin, 15 centigrammes; maltine, 5 centigrammes. For one cachet, to be taken in the middle of luncheon or dinner. Sometimes these cachets are less readily tolerated than the syrup; they sometimes give rise to a feeling of heaviness or even of pain, which has never been met with when the syrup is used. Glycerophosphate of iron is best given in pilular form, thus: glycerophosphate of iron, from 5 to 10 centigrammes; powdered rhubarb, 5 centigrammes; extract of cinchona, 15 centigrammes. One such pill to be taken at each meal-time.

HONEY OF ROSES.

[893.] Toufiat (*Monit. de Pharm.*) recommends the following preparation as not depositing crystals of grape sugar after preparation: Fifty parts fresh dried and powdered rose leaves are extracted with 150 parts 30 per cent. alcohol. The alcohol is distilled off from the percolate until 80 parts remain in the retort. To this add 160 parts honey, 68 parts sugar, and boil up the whole (*Pharm. Centr.*, No. 21, xxxvi., 307).

PRESERVING LIQUIDS WITH HYDROGEN PEROXIDE.

[894.] Burbi (*Bollet. Chim. Pharm.*) recommends hydrogen peroxide for preserving wine, beer, cider, vinegar, and other liquids. Ten parts of the commercial article is mixed with 1000 parts of the liquid. Peroxide of hydrogen is recommended by the author as of one of the best, handiest, and most harmless substances for preserving (*Pharm. Centr.*, No. 21, xxxvi., p. 307).

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C. ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the Editor, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

DRAWINGS for illustrations should be done with pen and ink (Chinese), and consist of clean, sharp lines, without shading. They should also be sent twice the desired size, so as to allow for reduction.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

*. * Queries should be addressed "Editor," and will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTERS.

THE COMPOSITION OF THE ATMOSPHERE.

J. VAUGHAN, of 44, Stratton Ground, Westminster, writes as follows:—"Some time ago you drew attention to a suggestion that was made to the possibility that the atmosphere of our globe had at one time a more complicated composition than it has at present. The law of reversibility renders that suggestion highly probable; for the products of the destruction by fire of organic matter point to the constituents from which organic matter has been originally derived. These constituents, which are principally carbonic acid, ammonia, gas, and aqueous vapour, with others (and not free oxygen and nitrogen), must at some period in the Earth's history have composed its atmosphere. It would be a very interesting speculation to trace the stages of the evolution of that atmosphere under the influence of sunlight and other terrestrial forces to its present condition; and to point out how these stages, which at first must be chemical, would be transformed to biological ones."

ANTI-EXTREME CUTTING.

MESSES. ELLIMAN, SONS, AND CO., reply to Mr. Pond's remarks in the Journal for June 14 as follows:—"We are no Don Quixotes wishing to fight windmills, and addressed our letter to manufacturers who are aiming at the same object as ourselves, and to some others who may have concluded that perhaps, after all, there is some good in the anti-extreme cutting movement. It is not our mission to remedy the evils of the drug trade, but we do consider it to be wise to endeavour to secure a reasonable profit both to the wholesale and retail firms that distribute Elliman's."

REVISION OF THE B.P.

"PATIENT" says: "The great matter that is agitating the mind, pharmaceutical and medical, is the revision of the British Pharmacopoeia. Now it has been lately brought to light that medical men ignore it almost entirely, and prefer Squire or Martindale to the work issued by the Medical Council. It has also been lately alleged that the present generation of doctors are well up in anatomy, physiology, pathology, etc., but not in therapeutics. They are apt to recognise the disease, but do not know the remedy. I am afraid that is true. I have

lately been attended by such a gentleman, who told me he only believed in about eighteen things. I told him I felt better and would take my own remedies. The chemist is the right man to make the Pharmacopoeia; he would make the best job of it."

PHOTOGRAPHY FOR CHEMISTS.

MR. THOMAS HENRY LIVESLEY, Whaley Bridge, writes:—"I am much interested in the *Pharmaceutical Journal* supplement, especially since the articles on photography began to appear. I am hoping by adopting those suggestions applicable to my business to turn them to good account."

ANSWERS.

IVO F. J. RODGERS.—1 and 5. *Arrhenatherum arenaeum*; 2. *Hordeum pratense*; 3. *Hordeum murinum*; 4. *Bromus mollis*; 6. *Nasturtium amphibium*; 7. *Nasturtium palustre*.

H. S. IRONMONGER.—The *Erigeron philadelphicus* was undoubtedly an escape. The plants now sent are *Valeriana officinalis* and *Orchis maculata*.

D. S. DAVIS.—Kola is not "merely a proprietary name," nor could it with strict accuracy be described as "a curatory drug." It consists of the seeds of *Sterculia acuminata* (Sterculiaceae), which contain caffeine, and possess stimulating and sustaining properties, much the same as coca leaves.

S. HARDWICK.—Thanks for prompt reply.

SIDNEY PHILLIPS.—The most likely book for your purpose is Britten and Boulger's 'Biographical Index of British and Irish Botanists' (Newman and Co., London), which is well up to date. The best way to obtain information concerning foreign botanists is through the medium of the scientific press. So far as living botanists of note are concerned, you will find their names and addresses, special departments of study, etc., in 'The International Scientists' Directory' compiled and published annually by S. E. Cassino, Boston, U.S.A. In the 'Index Kewensis' you will find references to the journals where plants were first referred to under given names, and there, of course, the botanists' names would be given in full.

ERNEST C. CRIPPS.—See page 1191 for the information you require.

J. POLLARD.—Your advertisement has been handed to Messrs. Street Brothers, to whom it should have been addressed.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Allen, Clarke, Harvie, Hill, Krohn, Lewis, Long, Mumbray, Phillips, Powell, Robinson, Sutton.

Obituary.

ELLIOTT.—On June 9, George Elliott, Chemist and Druggist, late of Walsall. (Aged 65.) Mr. Elliott had been a member of the Pharmaceutical Society since 1869.

GRIME.—On June 16, Thomas Grime, Chemist and Druggist, Darwen. (Aged 59.) Mr. Grime had been a member of the Pharmaceutical Society since 1872.

THOMPSON.—On June 17, Edward Thompson, Chemist and Druggist, Leeds. (Aged 83.)

Publications Received.

[Publishers are requested to state the price of books sent for review.]

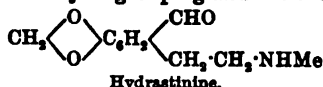
THE DRUGGISTS' GENERAL RECEIPT BOOK. By HENRY BEASLEY. Tenth Edition. Pp. 588. Price, 6s. 6d. (J. and A. Churchill, London.) From the Publishers. THE IMPERIAL TRADE REVIEW FOR MAY. From the Publishers.

"THE MONTH."

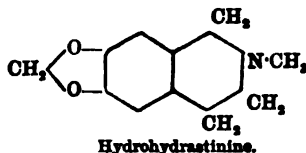
Argonin. Under this name a new silver preparation has been placed upon the market, which is prepared according to a process devised by Liebrecht and Röhm, of the Brealau Physiological Institute. The process consists in precipitating a solution of silver nitrate and casein-soda with alcohol. Argonin is described as a fine, white powder which dissolves in water with a neutral reaction. The silver in the compound is not precipitated by chlorides, ammonium sulphide, etc. As the result of experiments upon species of gonococci, argonin is recommended by Drs. Meyer and Jadassohn as an efficacious disinfectant (*Apot. Zeit.*, x., 439).

Hydrastine. Hydrastine, an alkaloid found in *Hydrastis canadensis*, is one of a group of bases very closely connected with each other, including berberine, narootine, and paverine. Freund and Schmidt working by different methods determined the constitution of this alkaloid, and showed it to be formed from hydrastinine, $C_{11}H_{13}NO_3$, and opianic acid,

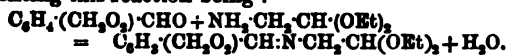
$[C_6H_7 \cdot CHO \cdot (OCH_3)_2 \cdot COOH](4,1,2,3)$, by elimination of the elements of water. Further, it was shown that hydrastinine contains an aldehyde grouping and has the formula—



From hydrastinine, by the elimination of oxygen by reducing agents, hydrohydrastinine is obtained, which has the formula here given, and is an isoquinoline derivative—



Fritsch has recently demonstrated the correctness of the above views by the synthesis of hydrohydrastinine. The synthesis was made by first preparing piperonal-acetalamine by the interaction of piperonal and acetalamine, the equation representing this reaction being:—



The piperonal-acetalamine thus formed is treated with sulphuric acid, when ethyl alcohol is split off and the ring closes, an isoquinoline derivative being formed. This compound is then reduced by a suitable reducing agent, as tin and hydrochloric acid, and a methyl group introduced by treatment with methyl iodide. The identity of the hydrohydrastinine thus formed with that obtained from hydrastine was proved by comparison of the base and the salts (*Liebigs Annalen*, 286, 21).

Moist precipitates are found by Austen and Broadhurst to dry readily on absorbent blocks, artificially made by thoroughly mixing equal parts of infusorial earth and plaster of Paris, moistening the mixture with sufficient water to work easily, and placing in moulds. These are made by taking a large sheet of glass, greasing the surface with light lubricating oil, and laying on edge on the sheet long glass strips an inch wide, and a quarter of an inch thick. The distance apart

of the strips should be six inches or more, and cross pieces cut from similar strips will then complete the squares. All the strips should be slightly oiled, and when the wet mixture is poured in the top should be smoothed with a straight edge of wood. When set the blocks are removed and heated for a day or two in an air chamber at 100° to 120° , to free them from hygroscopic moisture. In use the filtering paper containing the wet precipitate is placed on the smooth side of the block (*Journ. Am. Chem. Soc.*, xvii., 472).

Citric Acid from Cane Sugar. A short time ago, E. Maumené stated (*ante*, p. 961) that the addition of potassium permanganate solution to solution of sugar resulted in the formation of manganese sesquioxide or protoxide and hexenic acid, $C_{12}H_{22}O_{14}$. Dr. T. L. Phipson now claims to have prepared citric acid from cane sugar by the action of permanganic acid. The solution of sugar was acidulated with a few drops of sulphuric acid, and a strong solution of potassium permanganate added. In a short time the solution became transparent and colourless. Neutralised with ammonia, and calcium chloride added, no precipitate was formed until the liquid was boiled, and the precipitate then obtained was soluble in acetic acid. On decomposing the calcium precipitate with sulphuric acid and evaporating the solution, small but well-formed crystals appeared, which corresponded in shape and properties to those of pure citric acid. Excess of permanganate resulted in the formation of oxalic acid in addition (*Chem. News*, lxxi., 296).

Helenin. J. Bredt and W. Posth find that the formula of helenin is $C_{16}H_{26}O_2$; it possesses a neutral reaction, and dissolves in warm alkaline solutions, being simultaneously converted into the salt of an oxy-acid. The oxy-acid is completely reconverted into the lactone by heating to the melting point, or partially, by warming with water; if to the latter a mineral acid is added, the lactone immediately separates. The authors have also investigated several derivatives of alantolactone or helenin (*Lieb. Ann. and Chem. Zeitung*, xix., 163).

Crystallised Cinchonine. F. Roques has obtained cinchonine in crystals by melting the neutral sulphate of cinchonine at 130° C. and purifying the cinchonine by repeated crystallisation from water in the form of oxalate. The solution of oxalate was treated with potash and the free base extracted by means of ether. The ethereal solution was then concentrated by boiling on a water bath in a current of dry hydrogen, and the syrupy liquid produced, when cooled rapidly with methyl chloride, was converted in a few hours' time into a mass of prismatic crystals. The composition attributed to the crystals is $C_{20}H_{23}N_2O$. They are anhydrous, of a pale amber colour, melt at 49° – 50° , and their rotatory power is $[\alpha]_D = +48.25$ in absolute alcohol (1 per cent. solution), or $[\alpha]_D = +28.75$ in water acidulated with hydrochloric acid. Though soluble in benzene, toluene, acetone, chloroform, and alcohol, cinchonine has not so far been crystallised from its solutions in those liquids. The solubility in ether increases in proportion to the freedom of the liquid from water. The chloro-zincate, chloro-cadmiate, chloromethylate, iodo-methylate, and bromo-ethylate of cinchonine have also been obtained in crystalline form (*Comp. rend.*, cxx., 1170).

Potassium Platinochloride. A. L. Winton, in a lengthy paper on some conditions affecting the accuracy of the determination of potash as potassium platinochloride, states that the error occasioned by the presence of water in the precipitate can be greatly reduced, and the process of drying simplified, by adding the platinum solution to a dilute solution of the potash salt (one part potassium chloride or six-tenths of a part potassium oxide to 100 C.c. of water) and drying the potassium platinochloride at 100° C. The granular crystals thus obtained, though not perfectly dry, are as free from water as the usual pulverulent precipitate is after being heated at 160° C. for many hours. In some comparative experiments platinic chloride was added: (1) to a concentrated solution of potassium chloride, from which a large part of the potassium platinochloride was precipitated at once in a pulverulent form and the remainder deposited on evaporation; (2) to a solution of the potash salt, which was so dilute that no precipitate was formed and the platinochloride was only obtained on evaporation. The radiating crystals constituting the pulverulent precipitate in the first experiment enclosed much mother-liquor, in consequence of which the double salt dried slowly at 100°, lost more moisture when further heated for many hours at 130°, and still more at 160°. In the second case, however, the octahedrons formed were comparatively free from cavities and yielded practically the same results after drying for three hours at 100° (*Journ. Am. Chem. Soc.*, xvii., 453).

Reduction of Nitric Oxide by Metals. In the course of Priestley's experiments on gases, he found that when a large surface of iron was exposed in a vessel containing nitric oxide and moisture the gas was gradually reduced to nitrous oxide. A certain proportion of ammonia is also formed in this experiment, and the same effects are produced when the iron is replaced by zinc. P. Sabatier and J. B. Senderens have now investigated the conditions under which these reactions take place. They found in one experiment that, in the presence of zinc and water, the volume of gas gradually diminished until it equalled only 38 per cent. of the volume of nitric oxide originally taken, but it then began to increase by the disengagement of hydrogen. Three-tenths of the gas consisted of unaltered nitric oxide, and the remainder contained 28 per cent. of nitrous oxide, 70 of nitrogen, and 2 of hydrogen. Subsequently, the volume of both oxides of nitrogen diminished, until, on the nineteenth day, the residual gas, which was proved to be combustible, consisted of 62 per cent. of nitrogen and 38 of hydrogen, whilst the water in the flask employed contained ammonia. Nitric oxide kept over mercury in the presence of iron and water was not entirely decomposed until the seventy-fourth day, when the residual gas consisted of 61 per cent. of nitrous oxide, 36 of nitrogen, and 3 of hydrogen. It was clearly established that the nitrous oxide and nitrogen were formed simultaneously. Next, iron was allowed to act upon solution of nitric oxide in ferrous sulphate solution. Only the first portions of gas given off contained nitric oxide, and then only in small quantity. At the end of the first hour the gas consisted of 68 per cent. of nitrous oxide, and 32 of nitrogen, no

trace of hydrogen being apparent until the expiration of two hours. The nitrous oxide gradually diminished in volume, whilst the other two gases increased, until about the fifth day the nitrogen attained its maximum, 75.3 per cent. Afterwards the hydrogen increased whilst the nitrogen diminished, the proportions per 100 volumes of gas at the end of two months being 48 per cent. of nitrogen and 52 of hydrogen. The amount of ammonia formed did not exceed 0.25 Gm. per litre of liquid. Zinc acted upon nitric oxide dissolved in ferrous sulphate solution more rapidly than iron, but the results were practically the same in both cases (*Comp. rend.*, cxx., 1158).

Cobalt Nitrate as an Indicator. Cobalt nitrate is recommended by G. C. Stone as an indicator in the volumetric determination of zinc by titration with ferrocyanide. The cobalt solution should be quite dilute, and a drop of it placed on a white porcelain plate, just touching a drop of the solution to be tested. If the drops touch but do not mix, the end reaction is marked immediately by a greenish line at the junction of the two. The best strength of the ferrocyanide solution was found to be about 30 Gm. per litre (*Journ. Am. Chem. Soc.*, xvii., 473).

Properties of Acetylene. P. Villard finds that acetylene prepared by Moissan's process resembles carbon dioxide in becoming solidified by its own evaporation when in the liquid state, and under ordinary atmospheric pressure it is solid at -85° C., its fusing point is -81°, and the coefficient of solubility of the gas at 0° C. under a pressure of 4.65 atmospheres is 1.6. Acetylene hydrate, $C_2H_2 \cdot 6H_2O$, is formed under the same conditions as the hydrate of nitrogen protoxide or carbonic acid, is denser than water, and forms crystals which are without action on polarized light (*Comp. rend.*, cxx., 1262).

Constituents of Nutmegs. W. Bussé, in his 'Arbeiten aus dem Kaiserl. Gesundheits-Amte,' states that the ash contained in nutmegs is not more than 5 per cent., and the proportion insoluble in muriatic acid does not amount to more than one-tenth part; for incineration 2.5 Gm. of freshly-ground material was used. The loss caused by drying ranges from 9 to 13 per cent. on the better qualities. Reckoning nutmegs to contain 8.10 per cent. of volatile oil (according to Schimmel), the proportion of water contained in them can only amount to 5 per cent. Fat was found to the extent of from 31.1 to 40.5 per cent., and this was obtained by ether extraction in Soxhlet's apparatus. The longish nuts, which appear to be preferred for nutmeg butter, showed the same quantity of fat (*Phar. Wochens.*, No. 19, p. 150).

Ricinin. M. Soave extracts ricinin from castor cake by boiling with water, straining, evaporating to an extract, and exhausting with alcohol. The alcoholic solution leaves on evaporation a resinous residue in which crystals of ricinin can be seen. Dilute soda removes nearly all resin and fat, and the ricinin can then be crystallised from water. Shelled seed yielded only .03 per cent.; the shells contain .15 per cent. The author was unable to obtain Tuson's nitrate or chloroplatinate of ricinin. Heated on a water bath with dilute soda, methyl alcohol is separated and ricinic acid formed (*Ann. di chim. e farm.*, and *Chem. Zeitung*).

**Salicylic
Acid in
Senega Root.**

Rubner, having noticed that a certain sample of senega root had a distinct odour of *Gaultheria*, attributed this to sophistication. In reply, however, Goldener shows that under certain conditions many plants of the natural order Polygalaceæ afford methyl salicylate, and that, therefore, the supposed adulterant is a natural constituent of the root (*Pharm. Zeit., Jahr. 40, No. 36, p. 300*). O. Dünneberger points out that the Swiss Pharmacopœia has adopted the detection of salicylic acid in the ether extract of senega root as a test of identity. Methyl salicylate is a normal constituent of the root, and its detection by this test cannot be regarded as proof of fraudulent addition of oil of wintergreen, as has recently been asserted (*Schw. Wochenschr., xxxiii., 197*).

Mace Oil.

E. Spaeth has examined the fat extracted by petroleum spirit from different varieties of mace, and finds that Bombay mace contains a fat essentially different from that in other kinds of mace. The chief distinctive characters are the melting point (about 31° C.), iodine number (51.3 to 53.5), Zeiss' refractometer-degrees (about 48.5), and saponification number (189.4 to 191.4). Fat from Banda mace melted at 25° C. to 26° C., yielded an iodine number varying from 78.0 to 80.4, indicated in Zeiss' refractometer 76° to 82°, and gave a saponification number of 170 to 173. The above data Spaeth proposes to utilise for the identification of Bombay mace. This variety of mace, which is characterised by the small proportion of volatile oil it yields, is derived from *Myristica malabarica*, and has been frequently observed as an adulterant of genuine mace. Microscopically it can be identified by the large number of rounded cells it contains, filled with a dark yellow colouring matter (*Forschungs Berichte, ii., 148*).

**Coniine
in
Elder.**

G. de Sanctis, during a microscopical examination of elder twigs and leaves, detected an alkaloid which he succeeded in isolating by extracting with dilute acid, precipitating with lead, removing excess of lead by sulphuric acid and separating the alkaloid by potassium-bismuthic iodide. The regenerated alkaloid agreed with coniine both in its chemical and physical properties. Only .005 per cent. could be isolated (*Gazz. Chim. Ital., 1895, 25, through Pharm. Zeitung*).

**Alkaloids
of
Senecio
vulgaris.**

A. Grandval and H. Lajoux have obtained two alkaloids from *Senecio vulgaris*. The first, SENECONINE, occurred in quantities varying from 0.068 Gm. to 0.486 Gm. per 1000 Gm. of the dried plant, according to the time of collection. It crystallises from chloroform in rhomboidal tablets, is not appreciably soluble in ether, and dissolves in alcohol of 90° to the extent of 0.64 per cent. at 18° C. The rotatory power of the base, which possesses a strongly alkaline reaction, is given as $[\alpha]_D^{20} = -80.49$, and its composition corresponds to the formula— $C_{15}H_{25}NO_6$. SENECONINE, the second alkaloid, was separated from the alcoholic mother-liquors after the removal of the senecionine by evaporating to dryness, treating the residue with ether, and then dissolving in boiling water acidulated with tartaric acid. Needle-shaped crystals with an acid reaction separated from the solution on cooling, and were found to effloresce rapidly in the

air. The quantity obtained was not sufficient to determine the composition of the base, but it is described as much more bitter than senecionine, from which it also differs by being soluble in ether. The acid tartrate is slightly soluble in cold water, and more soluble in boiling water. Senecine gives a yellowish coloration with sulphuric acid, changing to violet-tinted reddish-brown; nitric acid produces a reddish-violet coloration and a deep violet precipitate; and sulpho-vanadic acid causes a brownish-violet coloration. These colour reactions distinguish senecine from senecionine. Both bases reduce potassium ferrocyanide, and give a violet coloration with potassium permanganate and sulphuric acid (*Comp. rend., cxx., 1120*).

Caffearine.

Paladino has isolated from coffee beans a new alkaloid, crystallising in needles, which he proposes to name caffearine. It is precipitated by potassium-bismuthic iodide after the removal of theine by shaking with chloroform. From the precipitate the alkaloid can be regenerated (*Chemiker Zeitung, xix., 155*).

**Vegetable
Cholesterins.**

E. Gérard describes various cholesterins found in cryptogamic plants—yeasts, moulds, and lichens. That of beer yeast crystallises from ether or chloroform in fine needles, which possess a very decided dextro-rotatory power, $[\alpha]_D^{20} = -105^\circ$. The cholesterin of *Mucor mucedo* has not been obtained in sufficient quantity to determine its physical constants, but it is stated to resemble Tanret's "ergosterin," as does also the cholesterin isolated from *Lobaria pulmonacea*, and the author is inclined to favour the idea that all the cholesterins existing in the lower plants belong to a special group—the ergosterin group. They are coloured red by concentrated sulphuric acid, and the subsequent addition of water causes a green precipitate, whilst animal cholesterin gives a yellowish colour with the same acid and a white precipitate on afterwards adding water. If dissolved in carbon tetrachloride and sulphuric acid (s. g. 1.76) be added, it also gives a yellow coloration, which becomes milky white on the addition of water, whilst the tetrachloride separates uncoloured. On the other hand, the ergosterins give a blood-red coloration, and the separated tetrachloride is coloured green. Again, a chloroformic solution of animal cholesterin is coloured citron yellow and red successively by the addition of benzoic anhydride and sulphuric acid. The chloroform separates with a blood-red colour which changes to violet in about twenty-four hours, and the sulphuric acid becomes brown with an intense green fluorescence. Ergosterins under similar conditions become blood red, the chloroform is coloured yellowish-brown and becomes colourless in about twenty-four hours, and the sulphuric acid is brown with a faint green fluorescence. Hesse's "phytosterin" gives the same reactions as animal cholesterin (*Journ. de Pharm. et de Chim. [6], i., 601*).

**Vegetable
Proteids.**

The proteids of the rye kernel soluble in water are, according to T. B. Osborne, leucosin (albumin) and proteose. Edestin (globulin) is soluble in saline solutions, gliadin in alcohol, and another proteid in dilute alkalies only. The edestin and proteose together constitute 1.76 per cent. of rye flour; gliadin, 4.0; leucosin, 0.43; and insoluble

protein, 2.44; total, 8.63 per cent. of proteids. Barley proteids are to some extent identical with those of rye, as they include leucosin and proteose soluble in water, and edestin soluble in saline solutions. Hordein, a specific proteid, is soluble in dilute alcohol, and there is also an insoluble proteid present. The average percentage of edestin and proteose present in barley flour is estimated at 1.95; that of hordein, 4.0; of leucosin, 0.3, and of insoluble proteid, 4.5—total, 10.75 per cent. (*Journ. Am. Chem. Soc.*, xvii., 429 and 539).

Preserving Organised Urinary Sediments. Bohland (*Med. Chir. Rund.*, 1894, 628) recommends the following process:—Collect the sediment by draining off the urine as much as possible; wash with physiological salt solution (4 sodium chloride, 3 sodium carbonate, 1000 water), immerse in Muller's liquid (20 potassium dichromate, 10 sodium sulphate, 1000 water.) Renew this three to four times during a fortnight. After the Muller's liquid has been removed carefully, harden with alcohol. The alcohol is renewed until it remains quite colourless. The organised parts of the urinary sediment remain unchanged, except that they appear somewhat shrunk (*Med. Chir. Rund.*, and *Pharm. Centralk.*, xxxvi., 260).

Malt Wine. Natural malt wine, which has attracted some attention as a nutrient and restorative, resembles in strength, sweetness, and taste, sherry, Madeira, Malaga, or Tokay, according to the manner in which it is prepared. All the varieties are clear, strongly alcoholic, and free from any unpleasant taste. As far as its origin is concerned, malt wine may be considered a beer, but in its constituents and properties it is to be regarded as a wine. It is made as follows:—Ground malt is mixed with water and carefully heated. To the liquor obtained by pressing a pure culture of the lactic acid ferment is added in order to give the necessary acidity. It is then fermented by carefully selected and cultivated wine yeast at the usual temperature. After the production of the alcohol, which can be increased by the addition of cane sugar, the wine is freed from every trace of the odour of malt by allowing it to remain for several weeks in contact with air frequently renewed. It is then racked off into barrels and allowed to ripen. The wine thus prepared contains 11.5 to 15 per cent. of alcohol, 11 to 25.5 per cent. of extractive matter, 0.06 to 0.15 per cent. of phosphoric acid, and 0.7 to 1.5 per cent. of total acid (*Zeitschr. f. Krankenpf.* and *Pharm. Zeitung*, xl., 390).

Effects of Heat on Milk. Cazeneuve and Haddon consider that the result of numerous experiments conducted by them proves the yellow coloration of milk caused by heating to be due to oxidation of the lactose in the presence of alkaline salts. The lactose is converted into formic and other acids which coagulate the casein, the latter being unaltered except that it is coloured yellow by substances formed at the expense of the lactose (*Comp. rend.*, cxx., 1273).

Colouring Matter of Gentian. E. V. Howell has investigated the yellow colouring matter of gentian, and the results obtained point to the conclusion that it may be quercitrin or one of its decomposition products. The substance is a glucoside, and a solution of its crystals has a neutral reaction. It gives a yellow precipitate

with lead acetate, soluble in acetic acid; solutions of silver nitrate and gold chloride are reduced by it; with ferric chloride it assumes a dark green colour; and its ammoniacal solution turns brown on exposure to air (*Druggists' Circular*, xxxix., 127).

Sterilised Bandages. Turner and Krupin, recognising the advantages of sterilised bandages and the difficulty of obtaining them from the retail pharmacist, have investigated the sterilisation of bandages packed in closed cardboard boxes. They found that steam at 100° C. or 101° C. penetrated the box and completely sterilised the bandages, and recommend that surgical dressings so packed and sterilised should be supplied by wholesale houses to pharmacists. It appears that such sterilised dressings are supplied by a Berlin firm (*D. Med. Wochensch. and Pharm. Zeitung*, xlvii., 389).

Copper Compounds in Agriculture. A. Girard has conducted experiments during recent years to ascertain whether the accumulation in the soil of copper compounds used as insecticides has any ill-effect upon future crops or upon human beings and animals consuming the produce. As a result he finds that there is no apparent falling off in the crops, and a careful examination of the different vegetable products is held to establish their absolute innocuousness from a hygienic point of view (*Comp. rend.*, cxx., 1147).

Poisoning by Ferrocyanide. Finck records a case of poisoning by ferrocyanide of potassium. A day-labourer who had swallowed a quantity of the salt was found in a semicomatose state. On complaining of thirst he was given vinegar to drink, and soon afterwards died. It would appear, therefore, that the acids present in the stomach were sufficient to liberate small quantities of hydrocyanic acid, and that the reaction was accelerated by the vinegar (*Forschungs Berichte*, ii., 148).

Sulphur in Keratin of Hair. Mohr finds that the percentage of sulphur in the keratin of human hair is higher than that obtained from animals. His analysis of keratins from various sources shows the following percentages of sulphur:—Woman's hair, 4.95 per cent. sulphur; girl's, 5.34; boy's, 4.98; rabbit's, 4.01; calf's, 4.35; horse's, 3.56; pig's, 3.59; sheep's wool, 3.68; goose's feathers, 2.59 to 3.16; pig's hoof, 2.69; calf's hoof, 3.57; ox hoof, 3.4 (*Public Health*, vii., 339).

Size of Drops. F. Eechbaum has directed his attention to the well-known differences existing in the size of drops of various liquid from tubes of uniform size. The factor which determines the size of the drop is the outside diameter of the tube, not the size of its aperture. Eechbaum has compiled a table showing the relative weights of drops of various medicinal agents, and recommends physicians either to make themselves familiar with such a table, or better, to prescribe solutions by weight instead of drops; in the latter case the pharmacist could indicate on the label the number of drops to be taken. Thus, a solution containing, say, morphine, could be ordered in doses of 1 gramme; the pharmacist could direct it to be taken in an equivalent number of drops, in this instance ten (*Deutsch. Med. Wochenschr. and Pharm. Centralk.*, xxxvi., 336).

HOLIGARNA, AND ITS BLISTERING PRINCIPLE.

BY DAVID HOOPER, F.L.S.

Quinologist to the Government of Madras.

All observant forest officers in India have noticed at different times the remarkably caustic nature of the black secretion that exudes in the dry weather from various species of *Holigarna*. The tree is called in Malabar the black varnish tree, in contra-distinction to the yellow-varnish tree, or *Garcinia*, which yields the gum-resin known as gamboge. The black varnish is used for waterproofing boats, furniture, and houses, and for indelibly fixing black figured patterns on linen and cotton cloths. There are other natural black varnishes obtained from anacardiaceous trees growing in Burma, China, Japan, and Ceylon, and the exact character of their exudations would form the subject of an interesting research, but the present article endeavours to show the nature of the vesicating principle separated from an hitherto unexamined Indian genus.

Alluding to *Holigarna longifolia*, Roxb., Colonel Beddome describes it as a common tree about the Western Ghats of the Madras Presidency, from Canara to Cape Comorin, which yields a very black, acrid juice from the trunk and rind of the fruit. This is used by painters as a varnish. Mr. Gamble, in describing this large tree, says, "It gives a black acrid exudation, which raises blisters and is much dreaded by the hill people." Mr. Bourdillon, Conservator of Forests for Travancore, says of it, "The whole tree, leaves, bark, and fruit, secrete a very poisonous black juice, which raises blisters when it falls on the body. It affects some people and not others." The fruit is referred to by some writers as a medicinal agent, but its action, and the uses for which it is employed, are not stated.

There are seven known species of *Holigarna*, all of which are Indian. Their names and geographical distribution are thus recorded in the 'Flora of British India.'

- H. arnotiana*, Hook., Western Peninsula.
- H. ferruginea*, Marchand, W. Peninsula, Travancore.
- H. longifolia*, Roxb., Chittagong, Pegu.
- H. helferi*, Hook., Tenasserim.
- H. grahamii*, Hook., Western Peninsula.
- H. beddomei*, Hook., Western Peninsula.
- H. albicans*, Hook., Pegu, Martaban.

The native names applied to these trees are chareí, karun-chareí, cattu-tjeru (*Malayalam*); kalu-geri, kuti-geri, hool-geri (*Canarese*); bibu (*Mahratta*). Mr. Bourdillon forwarded some specimens of the fruits of *Holigarna ferruginea* for examination. The exudation from the stem has blistering properties, but this can only be obtained in the dry weather, about March and April.

The fruit is a drupe, ovoid or elliptic in shape, black coloured, about seven-eighths of an inch long by half an inch in diameter. The pulpy pericarp becomes thin when dry, and is of a uniform black colour, but the pulp when fresh is greenish and mucilaginous. The testa is thin and dark-brown, and encloses a whitish starchy pair of plano-

convex cotyledons, with dark coloured veins running through them. The embryo is suspended from below the apex of the fruit, and the minute radicle is situated next to the hilum.

The aqueous soluble extract of the pericarps consisted of mucilage, with a small quantity of a tannic acid giving a green colour with ferric chloride. The ether and alcohol extracts of the pericarp contained the active vesicating principle of the fruit, associated with the black resinous substance forming the varnish. This principle was separated from the resins by adopting the process devised by Stædeler in examining the acrid principle of the cashew fruit. An ethereal tincture was made of the bruised pericarps, and the ether was allowed to evaporate without heat. The residue was dissolved in alcohol and treated with some freshly precipitated oxide of lead. The grey precipitate was collected on a filter, and after washing was digested in some ammonium sulphide solution. The lead sulphide was filtered off, and the filtrate was treated with dilute sulphuric acid, which separated a small quantity of oily substance. This melted at 26° and was recognised as anacardic acid. The filtrate from the grey precipitate was carefully evaporated at a low temperature, and left a yellowish coloured oily residue, which had a most irritating and acrid taste when applied in a most minute quantity to the tongue, and produced a redness and soreness when rubbed on the arm. It is evident, then, that the fruit contained a body very much allied to, if not identical with, cardol, and that the constituents are very similar to those found in the marking nut.

The seeds when dry had a peculiar odour of *Ceratonia* pods. They contained gallic acid, 12·4 per cent. of tannic acid, 8·5 per cent. of fat, and 3·7 per cent. of mineral matter. A section of the seeds touched with a drop of caustic soda turned the colour of the anastomosing veins into a bright blue, and formed a pretty object under the microscope. The alcoholic solutions of both pericarp and seeds gave a greenish colour with caustic alkalies; no doubt the principle giving this colour was contaminated with other substances which afforded red tints with soda, for when separated from the tannin it gave a blue colour. Basiner in 1881 found that the oil from the pericarps of the marking nut tree gave a green colour with potash, and Dr. Lyen in his 'Medical Jurisprudence for India' relies upon this test in detecting the presence of the marking nut in toxicological investigations. As will be seen above, Bastuz's test for the marking nut would show the same result if applied to similar preparations of *Holigarna*.

It is interesting to notice that the properties of the *Holigarnas* are similar to those of two other trees of the same natural order, namely, the marking nut (*Semecarpus anacardium*, L.) and the cashew nut tree (*Anacardium occidentale*, L.), and from recent investigations by Dr. Pfaff on *Rhus toxicodendron* and *Rhus venenata*, it is not at all improbable that cardol is present in other vegetable products of the Anacardiaceæ.

SOFT CHEESES are ripened by micro-biological processes, and E. Marshal (*Ann. de la Soc. belge de Microsc.*) states that amongst the numerous organisms concerned the chief part is played by the *Coccipora lactis*, Sacc.

THE ETHICAL ASPECTS OF THE PHARMACY OF TO-DAY.*

BY WILLIAM STEPHENSON, M.D.

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Under the prospect of a new edition of the British Pharmacopœia, the professional mind is at present being directed to pharmacy. There are some aspects of the subject which, although connected only indirectly with the Pharmacopœia, are yet well worthy of consideration. Recent developments are tending not only to modify the methods of prescribing, but also to affect the ethical relations of medical men to the pharmaceutical world.

Pharmacy, though now regulated by a distinct corporation, with its own organisation, protected by Acts of Parliament, is still a branch of the healing art. Home rule has been granted, but not independence. Between prescriber and dispenser there is a mutual dependence and mutual obligations over which an ethical, if not legislative, power should preside.

Though now distinct from medicine as a profession, pharmacy has developed a professional status for itself, safeguarded by examinations that demand considerable scientific education and practical training. This position, however, requires strengthening and purification. As a profession pharmacy has, in its business relations, to contend with gross influences, which, for the sake of gain, are engendering practices inconsistent with all professional character. A keen commercial and speculative spirit is becoming rampant; it threatens to degrade pharmacy, and is affecting seriously the interests of those who are devoting themselves to the work in a proper professional spirit.

The enterprise shown of late by pharmaceutical chemists is to be commended so long as its aim is the improvement of pharmacy by scientific and professional means. When, however, it becomes associated with the craving for gain, and endeavours to satisfy it by the introduction of novelties that are turned into proprietary interests, when it is promoted by self-laudation and misleading statements in persistent and obtrusive advertisements, then the professional spirit is crushed. Under such circumstances it behoves medical men to be on guard, lest they are enticed into abetting actions that are opposed to the treasured principles and traditions of their profession.

One marked feature of the present day is the invasion by wholesale houses of the province of the dispensing chemists. Machinery is displacing hand labour, wholesale manufacture the home-made article. From the wholesale manufacturer the druggist must obtain much of his stock materials, and on his knowledge, experience, and character we must rely for the selection as to quality; but in dispensing, the preference should always be given to the freshly home-made article over the factory compounds turned out in hundreds of gross, and that may be months and years old before they are used. In the movement the

spirit of personal aggrandisement can be readily detected. By a mere coating of varnish, or the use of a registered name, it is turning even the formulæ of the Pharmacopœia into proprietary preparations. If we prescribe for a patient any of the pills of the British Pharmacopœia, or of a well-known formula, have we any right, is it becoming, that we should require that they be those of one particular maker? Yet this is what the wholesale houses ask us to do, and is done by many practitioners. Would it not be more reasonable to require that the ingredients be those of certain makers than that the desired peculiarity should consist solely in the excipient or the coating of the pill? Chemists are now often compelled to keep in stock some half-dozen makes of an article which they themselves could freshly and as skilfully compound—all to suit varying whims and bring grist to particular mills. There are many remedies where it may be desirable to name the maker preferred, but then only as a recommendation. These are the proper factory or laboratory preparations demanding special skill and facilities; but when the prescription is of the nature of a pill, a syrup, or a mixture that, the formula being known, can be compounded by any qualified druggist, it is unbecoming to restrict the dispensing in any way.

In the present day the art of combining remedies and of prescription writing is imperfectly acquired and little studied. Ignorance is the fruitful soil of gullibility; hence the large crop of non-official compounds of remedies, combined in unrevealed proportions and by secret processes.

The objectionable character of proprietary articles is not removed by a professed publication of the formula. Any value they possess must either be a secret, or if the claim be skill and facilities in compounding, in most cases it is unsupported by such intrinsic value as to merit "exclusive dealing."

The Pharmacopœia Committee will have some difficulty in preparing the new edition. Can it be expected to keep pace with the "new pharmacy" with its tablets, tabloids, tabellæ, cachets, capsules, jelloids, hypoderms, perles, parrules, palatinoids, bipalatinoids, and soloids? There is good in the "new pharmacy," but this fresh development is showing a redundancy of action, and is invaded by and proving to be a favourable medium for the cultivation of the germs of pure personal aggrandisement. There are many instances where the capsule or the tabloid is a well adapted form for the administration of a remedy, but there is a danger, under the continuous pressure of puffs and samples, of the system being carried too far. The disciples of the "new pharmacy" are shouting "Eureka!" and are discarding draught and mixture.

An important question, however, has been raised, whether many drugs will act as efficiently when given in the dry and concentrated as in the fluid form, especially when freshly prepared. It may be difficult to prove the point as regards many medicines, but the special form in which a remedy is administered is not unimportant. It is known that the infusion of digitalis is at times more serviceable than the tincture;

* Abstract of a paper read before the Aberdeen, Banff, and Kincardine Branch of the British Medical Association. Reprinted from the *British Medical Journal*.

caffeine does not give the same results as freshly prepared coffee; and no one surely would prefer a tea tabloid to a cup of that beverage. For convenience sake, or to make the dose more palatable, we are to discard as of no importance the corrective and the adjuvant in our prescriptions.

Another marked feature of the pharmaceutical world of to-day is the extensive use of advertisements. In business this custom is legitimate and beneficial to the public, so long as it is conducted in a fair, truthful, and businesslike manner. But it is reprehensible and unbecoming when it assumes the aggressive form against rivals, and makes use of unwarranted statements dressed up in quasi-scientific garb, the truth that is half untruth—all calculated, if not intended, to deceive the public. It is to be regretted that pharmaceutical chemists are degenerating in the style of their advertisements.

The evil effect of the keen commercial speculation can be readily traced in the changes which the advertising mania is producing in infant and invalid feeding. Articles such as condensed milk, infants' food, essences and extracts of meat, all useful in their proper place, have been seized upon and made to serve the purposes of the insatiable greed of gain. Their proper use does not create sufficient demand to meet the excessive production arising out of the large sums invested in their manufacture. Hence that demand must be artificially increased. The speculative spirit conjures with the latest scientific terms and ideas, it seeks favour by fallacious quotations of chemical analysis and physiological experiment, and makes unwarranted assertions as to medical experience and opinions. Malt has "come as a boon and a blessing," not to babes alone, but to speculators too. Of the making of meat extracts there is no end. The fresh milk of the cow is discredited in every way. It must be sterilised, peptonised, "humanised," before it is fit for use. Freshly-prepared home-made articles are useless; invalids should be fed on factory-prepared meats and peptones, months and years old; and are not medical men all the country over aiding in the production of the artificial demand necessary to earn dividends to the joint stock companies limited, accepting chemical analysis as a test of digestibility, and thoroughly trusting in the permanency of the artificially-peptonised state of foods and the nutritive quality of desiccated and pulverised albumin and fibrin?

It is evident that there is much in the ethical aspects of the pharmacy of to-day that concerns medical men and has important bearings on the practice of medicine. Pharmacy is undergoing considerable change, but in the midst of the healthy development there is a growth which, in excessive production and the tendency to invade all surrounding interests, is verily of the nature of a cancer. It is destroying the professional spirit in pharmacy. By means savouring of chicanery and advertisements emulating in a refined manner the example of quacks, it is deceiving the public, and it has the effrontery to solicit the aid of medical men by asking them to be the touting agents for its goods.

THE BOTANICAL GARDENS AT BUITENZORG.

The latest report on these celebrated gardens, that for the year 1893, is divided into nine sections. The first relates to the *personnel* and organisation of the gardens; the second to the periodical publications connected with the gardens; the third to the herbarium and museum; the fourth to the botanical laboratory; the fifth to the culture garden and the agricultural-chemical laboratory; the sixth to the physiological laboratory; the seventh to the botanical garden and mountain garden of Tjibodas; the eighth to the office, library and photographic department; and the ninth to the investigation of the forest tree flora of Java. At the end there are three appendices, the first relating to a chemical investigation of the constituents of Java tea; the second consisting of a list of plants received, and their donors' names; and the third of a list of the plants and seeds distributed by the gardens in 1893.

It will thus be seen that a very considerable amount of work is done in these Gardens, which are probably better equipped than any other in the world, and certainly receive a State support that might be imitated with advantage by our own Government, in one, at least, of its botanic gardens in each quarter of the globe. The contributions under the first section consist of a paper on rainfall and the form of leaves, with three plates by E. Stahl; a contribution to the Malay flora by Dr. W. Burck; and an investigation of the genus *Gnetum* by G. Karsten.

Professor Stahl points out that the acuminate form of the leaf is particularly adapted for causing the rain to run quickly off the leaves, and that the so-called sleep of many leguminous compound leaves is adapted for the same purpose; the leaves of this kind being usually thin and unable to support a weight of water. Dr. Burck describes seventeen species of *Mucuna* of the Malay flora, of which seven are new, and the known species of *Erythroxylon*, including four new species, viz., *E. corbinatum*, *E. baccanum*, *E. latifolium*, *E. longistipulatum*, of which the first two are figured.

Dr. Karsten describes fifteen species of *Gnetum*, of which two, *G. ovalifolium* and *G. verrucosum*, are new. These papers, although prepared during the year 1893, could not be printed until the year 1894, when they appeared in the 'Annales du Jardin Botanique de Buitenzorg.'

Another publication, 'Mededeelingen uit S' Lands Plantentuin,' No. x., gives an exhaustive account of the poisonous and narcotic plants used to poison fish in all parts of the world, and forms the most complete list of these plants ever published. In 'Teymannia,' pt. iv., the Director of the Gardens published contributions on the injury done by caterpillars to aspen trees; on tanning barks and extracts of the Dutch East Indies; on the "dadap" disease in East Java, on the "bibit" disease in tobacco; and on batatas.

The tanning materials referred to are "tanggoeli," "pilang," and "kebesak barks," Indian oak, Indian willow, Australian *Acacia* bark, *Rhizophora* bark, catechu extract, gambier, "divi-divi," and Penang nuts.

In the herbarium and museum department it is interesting to note that no less than twenty-five herbarium specimens of the genus *Cinnamomum* were forwarded to D. Pfister, of Zurich, for examination in preparing his paper on cinnamon barks (see *Ph. J.* [3], xxiv., p. 941). The herbarium has also received a large number of plants as the result of an expedition ordered by the Dutch Government to investigate the flora of the Moluccas, New Guinea, Kei, Aroe Tenimber, and other islands.

In the botanical laboratory a micro-chemical investigation was undertaken by D. P. Anema, to determine the position of the alkaloids in the following species of *Strychnos*, viz., *S. nux-vomica*, *tielte*, *laurina*, *avillaris*, *minor*, *horrefeldiana*, and an unknown species occurring in the gardens. This is not yet completed, and is to include an account of the occurrence of the alkaloids during the growth of the plants. In the culture garden, experiments have been made, amongst other plants, upon galangal root, and *ipecacuanha*. The rhizomes of the former were found on distillation with water to yield only traces of essential oil, and the latter plant was found to yield only 18 grains of dried root from thirty-three plants. *Cola acuminata* flowered and fruited in 1893, and *Erythraeylon coca*, Lam., var. *spruceanum*, Burck, after weeding and manuring, yielded a good crop of leaves. Of the different methods of grafting the nutmeg, that known by the name of "plakken," whereby branches of a female plant are grafted on young trees grown in pots, proved to be the most successful.

In the agricultural-chemical laboratory the rhizomes of *Kampfforia rotunda* (which are used like zedoary in the East) have been distilled, and afforded about 0.2 per cent. of a volatile oil with a not unpleasant odour, and having a specific gravity of 0.886 to 0.894. Part of it distilled over between 200°, and the other, which was the larger proportion, boiled at 240°. In a tube of 200 Mm. the ray of polarised light was deviated 27° to the right. Messrs. Schimmel, to whom a specimen of the oil was sent, suggested that, judging from the odour, etc., it probably contained cineol and methyl chavicol.

The patchouli plant called "dilem," but of which the exact specific name has not yet been determined, was found to yield a volatile oil of a pleasant odour, which in one sample deposited a stearopten. It differs from ordinary patchouli oil in possessing in addition an anise-like odour. Its specific gravity is 0.961 at 15°, and it polarises to the left 32° 17' in a tube of 100 Mm.

The rhizome of *Zingiber zornumbet* afforded on distillation with water a quantity of large crystals, melting at 67°, together with a little volatile oil.

The editor points out that the *Costus speciosus* stated in Schimmel's report to yield 1 per cent. of volatile oil cannot be that plant, since the true plant distilled at Buitenzorg afforded no trace of oil, and suggests, which is no doubt the correct explanation, that the root distilled by Messrs. Schimmel was that of *Aplatantia auriculata*, which was formerly attributed to *Aucklandia costus*.

Some interesting experiments made on the leaves of some gutta-percha plants, viz., *Palagium borneense* and *P. gutta*, showed that the young leaves yielded respectively 6.5, and 5.7 per cent. of pure white gutta, the mature leaves 4.8, and 6.33, and fallen leaves 8 and 8.24 per cent., showing that the *P. gutta* is practically the richest of the two. The larger percentage in the fallen leaves is attributed to the destructive action of the sun and rain upon the tissues. The amount of gutta-percha obtainable from 150 trees of *P. gutta* nine years old is estimated at 40 kilogrammes. The gutta-percha was obtained perfectly white by first treating the leaves with boiling alcohol until it runs off colourless, and then with gasoline boiling at 60° to 80°.

In the pharmacological laboratory the examination of the bitter principle of "sambodja" bark (*Plumieris acutifolia*, Poir.) has been continued. It proves not to be a glucoside, and can be obtained in handsome white crystals. From *Dioscorea hirsuta*, Bl., the species used by the Malays for arrow poisons (*Ph. J.* [3], xxiii., p. 388), two alkaloids were obtained, one volatilised by steam and having a paralysing (*bedwelmende*) action on the nervous system, and the other not volatile and producing cramps and tetanus. They are easily decomposed, and are therefore difficult to obtain in the pure state.

A native remedy, known as "pronodjuvo," bearing a great reputation in diseases of the chest, has been identified as the fruit of *Euchresta horrefeldii*, Miq. They are difficult to obtain, as they are only known to occur in one place in the mountains of Java. They have been also examined chemically, and have been found to contain a very poisonous bitter alkaloid which has a narcotic action. The seeds of another plant (*Sterculia* sp.) bear the same native name. These also contain a small quantity of alkaloid, but it is scarcely, if at all, poisonous.

From the leaves of *Glochidium molle*, Bl., which is employed as a remedy for snake bites, small traces of an alkaloid have been obtained, but nothing else to which any curative or antidotal properties could be ascribed.

In the botanic gardens, amongst the numerous plants mentioned it is noted that *Mercurialis leucocarpa*, Sieb. et Zucc., yields a kind of indigo.

The other sections contain but little of general interest. The first appendix gives a lengthy account of the examination of Java teas. From the analysis of the ash it appears that potash and phosphoric acid are the two most constant and important constituents, the quantity of lime, magnesia and iron appearing to vary according to the soil in which the plant grows. The scientific details given are very full and should prove of interest to tea-growers in other colonies.

The other appendices, containing lists of plants and seeds received and sent, indicate that even this branch of the work of the garden is considerable, the number of packages sent out being 73, or an average of 1.5 per week. It is noticeable, however, throughout the work that no space is wasted on correspondence given in full, all the information is digested and summarised in a businesslike manner.

The Pharmaceutical Journal

FIFTY-FOURTH YEAR OF PUBLICATION.

SATURDAY, JUNE 29, 1896.

Editorial Department.

Communications for the Editorial department of the Journal, books for review, &c., must be addressed to the "Editor," 17, Bloomsbury Square, London, W.C.

Advertisement Department.

Advertisements and remittances must be sent to the Publishers, 5, Serle Street, Lincoln's Inn, London, W.C., where copies of the Journal may be purchased. Cheques and money orders should be made payable to "Street Brothers."

Instructions from Members, Associates, and Students respecting the transmission of the Journal must be sent to the Secretary—Mr. Richard Brombridge, —17, Bloomsbury Square, London, W.C.

CLOSE OF THE THIRD SERIES OF THE JOURNAL.

THE issue of the present number of the *Pharmaceutical Journal* completes the third series of this publication—extending over a period of twenty-five years—and although that circumstance might be made an opportunity for reviewing the many changes which have taken place meanwhile in regard to pharmaceutical affairs, it will be more appropriate to consider only those which directly concern the Journal itself. Hitherto—in common with the French *Journal de Pharmacie et de Chimie*, the German *Archiv der Pharmacie* and the American *Journal of Pharmacy*, which are still monthly publications—the *Pharmaceutical Journal* has been conducted mainly with the object of furnishing its readers with information as to scientific matters more or less intimately connected with the practice of pharmacy and as to the progress made in those branches of science which bear upon pharmacy. The Journal has also served as a medium of communication and for the discussion of pharmaceutical affairs, as well as to record the transactions of the Society and other proceedings affecting the business. The increase in the size of the Journal—introduced in the third series—and its more frequent publication gave opportunity for considerably extending the area covered by the subject-matter, and the contents of the twenty-five volumes may be accepted as conclusive evidence that there was no ground for the apprehension, once entertained, as to the impossibility of obtaining a continuous supply of suitable material for a weekly Journal.

But with the experience thus acquired, the idea has grown up that there is a possibility of still further increasing the utility of the Journal and making it

more generally acceptable under all the various conditions affecting the conduct of a chemist's business. This view is very generally entertained, and one of its chief exponents, Mr. R. A. ROBINSON, some years ago gave formal expression to it at an annual meeting, by a motion requesting the Council to consider the matter. Since the time when the third series of the Journal was commenced, there has been a very large increase in its circulation, consequent upon the growth of the Society. Although the number of members of the Society is now very nearly the same as it was then, there has been a great increase in the number of associates, that being the direction in which the Society is chiefly becoming representative of the trade. While in 1870 the total number of associates was only 540, it is at the present time very nearly 3000, and to that extent the Society and the Journal are more largely identified with the general body of chemists and druggists than they were. It was with the view of still further extending connection between the trade and the Society, that the supporters of Mr. ROBINSON's motion advocated the adoption of a suitable change in the Journal, calculated at once to command more general interest in it, and thus to bring about increase in the membership of the Society. Within the last few months an endeavour has been made to satisfy the requirements above referred to, and it has met with such unqualified approval as to justify the expectation that the interests of pharmaceutical organisation—of which the Society is the pivot—will be materially promoted by extending the scope of the Journal in the manner suggested. In order to bring this alteration within the cognizance of every member of the trade, a copy of the first number of the new series of the Journal will be sent to every registered chemist in business in the kingdom.

Before closing this article the Editor desires to emphasise the fact that the members and associates of the Society are alike proprietors of the *Pharmaceutical Journal* and equally interested in its success. To assist in promoting its success should be the endeavour of all of them, not only because the Journal is their common property, but also because it may be of use in cases where the interests of the pharmaceutical body are likely to be affected by legislative action. In this respect the Editor gladly takes the opportunity of expressing his thanks for the kind assistance he has hitherto received in various ways from members and associates of the Society throughout the country, and his belief that in the future similar help will be accorded to him. Such friendly aid will then be even more necessary, acceptable, and useful; hence it will be no disparagement of the gratitude now expressed to define it as a liberal anticipation of favours to be received.

AN ANTITOXIC SERUM FOR SNAKE POISON.

THE continued success of the antitoxic treatment of diphtheria has encouraged experimentation with the view of ascertaining whether the method is applicable to other forms of disease. Thus EMERICH and SCHOLL have applied the serum treatment to cases of cancer and sarcoma, with results which require further investigations. TIZZONI and CENTANNI have obtained encouraging results in the treatment of rabies in a similar manner. The latest application of the method is interesting in the highest degree. Professor FRASER, of Edinburgh, in the *British Medical Journal* of June 15, communicates the results he has obtained with the serum of animals rendered immune to the poison of the cobra, rattlesnake, and other poisonous serpents, representing the most deadly of the Ophidia of Asia, America, Africa, and Australia. Through the labours of many investigators, including KAUFMANN and SIR JOSEPH FAYRE, it has been proved that animals can be rendered proof against snake poison by the repeated administration of graduated doses of the venom. Professor FRASER has confirmed their results, and has proved in addition that the blood-serum of animals thus rendered immune possesses definite antidotal properties. Experiments were made with the venom of each of the four varieties on guinea-pigs, rabbits, and other animals, and the minimum lethal dose per kilogramme of the weight of each kind of animal was ascertained. This dose was found to differ greatly in the different animals. For instance, in guinea-pigs, in the case of cobra venom, it was 0.00018 Gm., while in the cat it was somewhat less than 0.00025 Gm. Thus the author points out that the poison rivals in its lethal powers the most active vegetable principles, such as aconitine, strophanthin, or acokantherin. When the resistance of the animals had been increased by the administration of graduated doses short of the minimum lethal, it was found that four or five times that amount could be given and "still the animal suffered little, and, in many cases, no appreciable injury."

The inquiry was in many cases rendered difficult by organic changes caused by the poison in the kidneys and in the blood, and also by functional disturbances. In spite of difficulties, Prof. FRASER by careful preparation succeeded in increasing the resistance of rabbits to such a degree that fifty times the minimum lethal dose could be administered subcutaneously without any obvious symptom of poisoning being manifested beyond a rise of body temperature, which lasted a few hours after the injection, accounting for a temporary fall in body-weight. During successful immunisation the animals, such as rabbits, increased in weight and showed increased vigour and liveliness. This was also seen "in an old and previously sedate horse."

The differences in the effects of the four kinds of venom were also investigated. Thus, it was found that the local action of the poison of the rattlesnake was much more marked than that of the cobra, though, in its general action the latter was sixteen times more powerful than the former. Gradual immunisation prevented both the local and the general effects of all four kinds of poison. The author was able to establish the rule that an animal protected against one form of poison was also rendered resistant to the others. As to the duration of immunity there has as yet not been sufficient time to judge, but in the case of a rabbit which at the end of the course of immunisation had received twice the lethal dose of rattlesnake poison, the same dose was repeated twenty days subsequently, and it altogether failed to produce toxic symptoms. Thus, as Professor FRASER points out, the protection lasts for a considerable time.

From the blood of immunised animals a serum was obtained which had marked antidotal properties. The serum, when dried, was found to be easily pulverisable and readily soluble. Experiments were made with the mixed serum of three rabbits, which had received last a dose of cobra poison equivalent to thirty times the minimum lethal dose. In one series of experiments a dose of cobra poison greater than the minimum lethal dose was mixed with the antitoxic serum (antivenene) in varying proportions, and it was found that so small a quantity as 0.004 C.c. per kilo of the animal's weight was enough to neutralise a deadly dose of poison, whilst 0.0025 C.c. was insufficient for the purpose. When thrice the minimum lethal dose was given, 1 C.c. per kilo. of antivenene gave protection, whilst 0.8 C.c. failed to do so. Three other series of experiments were made, and in one of these it was found that 0.8 C.c. per kilo. of antivenene injected thirty minutes after a minimum lethal dose gave protection. The results are detailed in a most interesting paper, which, though only an abstract, is a pattern as an account of an investigation of the highest possible importance. It will be seen that the methods are the same as those by which the new treatment of diphtheria was worked out. The importance of the research will be evident when it is remembered twenty thousand persons succumb annually to snake bites in India. With a view of testing the efficacy of the remedy in man, Prof. FRASER is preparing a large quantity of serum from a horse. No other remedy has, according to Sir JOSEPH FAYRE, been found to be efficacious, and since in 75 per cent. of fatal cases death does not occur until three to twenty-four hours after the infliction, there would be time in many cases for the exhibition of the remedy. Every right-minded person will wish all success to the treatment thus dis-

covered by the distinguished professor of materia medica of the University of Edinburgh, who, according to the latest intelligence, has now obtained definite proof of the antidotal properties of the blood-serum of venomous serpents. He is expected to make a further communication on the subject to the next meeting of the Royal Society of Edinburgh.

MEDICAL MEN AND THE U.S.P.

A CORRESPONDENT of the *New York Medical Journal* states that many members of the medical profession in the United States are unaware of the existence of the national pharmacopoeia, proprietary remedies of unknown composition having in great measure ousted official preparations in prescriptions. It is not denied that new remedies of great value have been introduced into medical practice, but it is urged that the majority of those which now flood the market and absorb the attention of many physicians are of questionable merit. "They are introduced and extensively advertised, not for the sake of suffering humanity, but for the pecuniary gain to their enterprising originators. The result of this must necessarily be detrimental to medical practice. Whereas the physician of a generation ago was quite as familiar as the apothecary with the drugs which he prescribed, the physician of to-day is daily prescribing drugs which he himself has possibly never tasted, handled, or seen. He is, moreover, led into laying aside the old, tried, and effective remedies, and misled into using certain new ones of the nature of which he is ignorant, and of the effect of which he is uncertain."

DISCUSSION ON PHARMACY LAW.

MATTER of special interest to our readers was under consideration at the meeting of the Western Chemists' Association, on June 19, when Mr. R. H. PARKER re-opened the discussion on the present phase of the poisons law in an able, albeit somewhat doctrinaire manner. The weak points in his address were promptly indicated by Messrs. E. N. BUTT and C. B. ALLEN, and an amended resolution was carried, which fairly indicates the reforms that should be aimed at, though it is doubtful if the one referred to in the second clause is feasible. Amongst the alterations suggested by Mr. PARKER, the proposed division of the qualifying examination is especially undesirable, since, as Mr. ALLEN observed, it would be quite impossible to limit a partly-qualified assistant's privileges, if it were once admitted that he was fitted to take sole charge of a pharmacy for a limited time (see page 1209).

ROYAL SOCIETY ELECTION.

We are glad to be able to chronicle the fact that Dr. J. REYNOLDS GREEN, M.A., Professor of Botany to the Pharmaceutical Society, has been elected a Fellow of the Royal Society. The medical profession is similarly distinguished by the election of Dr. SIDNEY MARTIN, of University College Hospital, who has earned the respect of his professional brethren by his invaluable work in connection with the Royal Commission on Tuberculosis.

SPECIAL CIRCULATION OF THE JOURNAL.

SOME remarks were made at the meeting of the members in Scotland of the Pharmaceutical Society, on Friday week, with respect to the circulation of the Journal amongst registered persons not connected with the Society. Our friends in Scotland seem to have overlooked the fact that the number for February 23 last was sent to everyone whose name appeared on the Register of Chemists and Druggists, whilst that for May 25 was sent to every chemist in business—in England and Wales, Scotland, and Ireland—whose address could be ascertained. Further, it has been announced for some time past that the first issue of the new series will next week be sent to the same persons, and in addition to more than five thousand other interested parties in the United Kingdom and abroad, over sixteen thousand copies being distributed in all. This is done specially to bring before the notice of pharmacists generally the changes that will henceforth mark our pages. It may not be amiss to suggest that those who now receive the Journal regularly may do much to draw attention to it in its new form, and so help it forward with renewed vitality and under the most favourable auspices.

THE NEW PHARMACY.

In a paper read before a Scottish Branch of the British Medical Association, Dr. W. STEPHENSON, of Aberdeen University, has drawn attention to the relations naturally existing between pharmacy and medicine, with the object of pointing out the prejudicial influence exercised by certain forms of modern pharmaceutical enterprise. He suggests that there is at the present time much in the ethical aspects of pharmacy that concerns medical men, and has important bearings on the practice of medicine. The opinions expressed are so well deserving the careful consideration of pharmacists desirous of maintaining a professional status, that we have reprinted the article at page 1198, as supporting from a medical point of view the views which have been on several occasions put forward in this Journal.

NORTH BRITISH BRANCH.

THE report of the result of the latest election for members of the Executive of the North British Branch of the Pharmaceutical Society (see p. 1204) shows that a few changes have been effected in the composition of that committee, Messrs. BOWMAN, COULL, and MOIR replacing Messrs. KINNINMONT, SUTHERLAND, and NOBLE, who had retired. It is satisfactory to note that Mr. LAIDLAW EWING once more heads the poll, and that, too, by a much larger number of votes than last year. This is sufficient proof, if proof were needed, that the labours of Mr. EWING for the good of the Pharmaceutical Society are properly appreciated in Scotland.

INDEX TO THE JOURNAL.

To ensure greater accuracy in the indexes to the volumes of the Journal, it has been decided to publish them in future with the first number of each new volume. In view, however, of the fact that next week's issue, which will commence the first volume of the new series, will be circulated amongst some thousands of chemists and firms who are not at present regular subscribers, the publication of the index to the present volume will be deferred until the following week.

Transactions of the Pharmaceutical Society of Great Britain.

NORTH BRITISH BRANCH.

ELECTION OF EXECUTIVE.

A meeting of members and associates in business, residing in Scotland, was held in the Society's House, 36, York Place, Edinburgh, on Friday, June 21, at 12 noon, Mr. J. Laidlaw Ewing in the chair.

The minutes of last meeting were read and approved, and apologies for absence were received from Messrs. W. L. Currie, and Robert M'Adam, Glasgow; James Paton, Edinburgh; and J. W. Sutherland, Dumfries.

The CHAIRMAN said he had again to refer with satisfaction to an increase in the number of those connected with the Society in Scotland. There were this year 383 voters as compared with 369 last year, being an increase of 14. While the movement was thus in the right direction it was perhaps a little slow. There had also been considerable interest in the election, and a larger proportion of voting papers had been returned than in any previous year. They would be acquainted with the Annual Report of the Executive to the Council, which had already appeared in the *Pharmaceutical Journal* of May 11, 1895, and indicated the work that had occupied the attention of the Executive during the past year. There had been a radical change in the constitution of the Board of examiners, and in connection with this change, Messrs. Nesbit and Gibson retired after many years of good service, which had earned them their highest respect and goodwill. They still, he was glad to say, would have the benefit of their experience and advice as members of Executive. An even more important change was the appointment of professorial or teaching examiners, and it was a matter of satisfaction to all Scottish pharmacists that they had secured for these positions such men as Professor Geddes and Professor Gibson. There had not been during the year any important decisions in pharmacy law in Scotland, but in England some important points had been settled in a way calculated to strengthen the hands of the Council in applying the salutary provisions of the Pharmacy Acts. By the vigilance of the Registrar also, they had been successful in frustrating several attempts to evade the Pharmacy Act by means of the Patent Office, and it was clear that the days of patented poisonous nostrums were about numbered.

Last year he had ventured to call special attention to the relationship of Scotland to the Benevolent Fund, and pointed out by comparison that there was much room for improvement. He regretted to say that as yet the returns did not indicate much practical result; indeed, in some cases there seemed to be rather a decrease. During the year there had been several grants to Scottish applicants, and in one recent case in Edinburgh the Council had shown their generosity. He hoped these instances might be the means of inducing some to subscribe who had not hitherto done so. With regard to the *personnel* of the Executive, there were

one or two changes. Mr. Kinninmont, who had long acted as a representative of Glasgow on the Executive, now retired, and they all wished him much comfort and happiness in his well-earned retirement. He was glad to know that they were to have the services of another gentleman who came from the same district of Glasgow. Owing to a feeling, which was now very general, that examiners should not be also members of Executive, Mr. Sutherland, of Dumfries, also retired. Hitherto they had been able to secure another representative from the southern district of Scotland, and he hoped that by another year they might be able to do so. Mr. Noble also retired, but they would now have the services of two new local men.

Their obituary for the past year was fortunately a short one. He might mention the late Mr. Seath, of Dunfermline, who was an early member of the Society in Scotland; he had been for some years a member of the old Council of the North British Branch, and up till the time of his death acted as local secretary to the Society. He was a very genial man and greatly beloved and respected by all who knew him. A few weeks ago also they had lost by death, Mr. Thomas Finlayson, of Leith, who had for many years filled the office of local secretary. For a considerable time feeble health had prevented his taking any active public part in pharmaceutical affairs, but he continued to take a lively interest in the work of the Society, and was always ready to give loyal assistance so far as in his power. They had also lost one of their oldest honorary members, the late Dr. Hugh Cleghorn, of Stravithie, St. Andrews. He was a very frequent visitor at the Society's House, and was always ready to show his practical interest in the Society's welfare. For several years he had been a contributor to the Benevolent Fund.

Before closing, he might refer to the past winter's evening meetings, which, though not numerous, were very successful. On two occasions they had been so well attended as to make them feel how great an advantage it was to have such a comfortable hall to meet in. At the meetings the subject of Pharmacopœia revision had been prominently taken up, and they had had a series of communications which he thought would materially aid in the preparation of the new edition.

The ASSISTANT-SECRETARY then read the report of the Scrutineers as follows:—

"At a meeting held on April 19, 1895, the Executive appointed June 21, 1895, as the date of the election for the ensuing year.

"Three hundred and eighty-three nomination papers were issued by the Assistant-Secretary on May 25.

"The nomination papers returned showed that seventy-four members and associates in business had been nominated, of whom the following twenty-eight signified their willingness to act if elected:—

Anderson, James Grant, 8, Maitland Street, Newhaven, Edinburgh.

Aitken, Robert, 73, Princes Street, Edinburgh.

Baker, William Charles, 13, Dundas Street, Edinburgh.

Bowman, John, 3, Duke Street, Leith.

Broomhead, George Emmet, 441, Union Street, Aberdeen.

Brown, John, 5, Alvanley Terrace, Edinburgh.

Coull, George, 17, Smith's Place, Leith Walk, Edinburgh.

Currie, William Little, 223, Byres Road, Dowanhill, Glasgow.

Davidson, Alexander, 172, High St., Montrose.

Ewing, James Laidlaw, 52, North Bridge, Edinburgh.

Fisher, John Hutchison, 66, High Street, Dunfermline.

Garvie, Alexander, 23, Bernard Street, Leith.

Gibson, Adam, East Thistle Street Lane, Edinburgh.

Hardie, James Miller, 68, High Street, Dundee.

Henry, Claude Francis, 1, Brandon Terrace, Edinburgh.

Kermath, William Ramsay, 1, North Bell Street, St. Andrews.

Kerr, Charles, 56, Nethergate, Dundee.

Lothian, John, West Thistle Street Lane, Edinburgh.

Lunan, George, 20, Queensferry St., Edinburgh.

M'Adam, Robert, 34, Virginia Street, Glasgow.

M'Cowan, Robert Thomas, 8, High Street, Paisley.

M'Laren, David, 42, South Clerk Street, Edinburgh.

Moir, James, 447, Victoria Road, Crosshill, Glasgow.

Nesbit, John, 162, High Street, Portobello.

Paterson, James, 15, Regent Quay, Aberdeen.

Strachan, Alexander, 138, Rosemount Place, Aberdeen.

Symington, Thomas, Wardie House, Boswall Road, Edinburgh.

Tocher, John, 36, High Street, Dunfermline.

"A voting list was accordingly drawn up, and on June 11 three hundred and eighty-three voting papers were issued.

"The Scrutineers met last night at 7 o'clock and proceeded to examine the voting papers.

"The result was found to be as follows:—

Voting papers issued.....	383
" " returned.....	233
" " informal.....	1

"There were thus 232 votes to be recorded. The following gentlemen have a majority of votes:—

Bowman, John, 3, Duke Street, Leith.

Coull, George, 17, Smith's Place, Leith Walk, Edinburgh.

Currie, William Little, 223, Byres Road, Dowanhill, Glasgow.

Davidson, Alexander, 172, High Street, Montrose.

Ewing, James Laidlaw, 52, North Bridge, Edinburgh.

Fisher, John Hutchison, 66, High Street, Dunfermline.

Gibson, Adam, East Thistle Street Lane, Edinburgh.

Hardie, James Miller, 68, High Street, Dundee.

Henry, Claude Francis, 1, Brandon Terrace, Edinburgh.

Kermath, William Ramsay, 1, North Bell Street, St. Andrews.

Kerr, Charles, 56, Nethergate, Dundee.

Lunan, George, 20, Queensferry Street, Edinburgh.

M'Adam, Robert, 34, Virginia Street, Glasgow.

Moir, James, 447, Victoria Road, Crosshill, Glasgow.

Nesbit, John, 162, High Street, Portobello.

Paterson, James, 15, Regent Quay, Aberdeen.

Strachan, Alexander, 138, Rosemount Place, Aberdeen.

"The voting papers and all other documents connected with the election are submitted herewith.

"JAMES L. EWING, *Chairman*.

"WILLIAM BURLEY. JAMES PATON.

"ROBERT L. HENDRY. JOHN ROBERTSON."

The actual result of the poll was as follows:—

Ewing.....	201	Paterson.....	128
Kermath.....	190	Moir.....	94
Kerr.....	188		
Currie.....	187	M'Cowan.....	91
Strachan.....	180	M'Laren.....	88
Henry.....	177	Aitken.....	85
Davidson.....	176	Lothian.....	84
Nesbit.....	169	Broomhead.....	71
Lunan.....	167	Tocher.....	70
Hardie.....	166	Garvie.....	57
M'Adam.....	152	Symington.....	40
Bowman.....	144	Brown.....	32
Fisher.....	143	Baker.....	29
Coull.....	141	Anderson.....	28
Gibson.....	134		

One voting paper had been received too late for the enumeration.

Mr. DAVID MURDOCH, Falkirk, moved the adoption of the report. He was glad to see that they had increased the number of Edinburgh men, for it was very necessary to have a sufficient number to attend to the detail work of the Society. It was, of course, necessary to have the country districts well represented, and he had no fear but that the proper men would be got to do so.

Mr. G. L. MCGIBBON seconded the motion.

The report having been unanimously adopted, the Chairman declared that the first seventeen names on the list given by the Scrutineers—together with the President of the Society (Mr. Michael Carteghe), the Vice-President of the Society (Mr. John Harrison), Messrs. John Johnston (Aberdeen), and David Storrar (Kirkcaldy), as *ex officio* members—would form the Executive for 1895-6.

On the motion of the Chairman, a vote of thanks was awarded to the Scrutineers.

On the motion of Mr. George Coull, seconded by Mr. William Burley, a cordial vote of thanks was awarded to the retiring Executive.

Mr. LUNAN said he would like to ask if it would not be better to hold the annual meeting in the evening, when a larger number could attend.

Mr. NESBIT said they had to consult the convenience of country members.

Several members said 12 o'clock was a very inconvenient hour.

It was remitted to the Executive to consider the suggestions made.

Mr. MURDOCH, Falkirk, said he would like to ask if any further steps were to be taken to put a stop to the keeping of open shops by surgeons who employed no qualified assistants. There had been some proceedings taken in Glasgow, but it seemed as if the evil still continued.

The CHAIRMAN said it had been clearly established that the practice referred to was illegal, and it would

not be lost sight of. Any cases should be reported to headquarters and they would be attended to.

Mr. LUNAN said he would like to suggest that, in connection with the proposed early enlargement of the *Pharmaceutical Journal*, something should be done to put it into the hands of registered men who were still outside the membership of the Society. He believed it would be the means of increasing the membership. At present there were about 1100 registered chemists in Scotland, of whom only about 400 were connected with the Society. They could do nothing in the way of obtaining a new Pharmacy Act while only about 33 per cent. of the registered chemists had joined the Society.

The CHAIRMAN said this was a question of expense. At present a copy of the Journal was sent once every year to every chemist on the Register.

Mr. LUNAN said that was not enough. He would suggest that it should be continued every week for a month or so.

Mr. COULL said he understood a copy of the enlarged issue would be sent to every registered chemist.

Mr. MURDOCH said those who did not get the *Pharmaceutical Journal* got the *Chemist and Druggist*, and thought they did enough when they subscribed for that.

Mr. LUNAN said he thought the enlarged Journal would, to a great extent, cover the ground at present occupied by the *Chemist and Druggist*.

Mr. NESBIT said the Journal had been very greatly improved. He was very much surprised that a larger proportion of registered chemists did not join the Society. There were many advantages in doing so, in addition to getting the Journal.

It was then agreed that Mr. Lunan might bring the matter before the Executive.

Mr. C. F. HENRY moved a vote of thanks to the Chairman which was heartily accorded, and the meeting then closed.

Proceedings of Societies in London.

ROYAL INSTITUTION OF GREAT BRITAIN.

SCIENTIFIC USES OF LIQUID AIR.*

BY PROFESSOR DEWAR, M.A., LL.D., F.R.S., M.R.I.

(Concluded from page 1183.)

For many purposes of investigation it is necessary to keep liquid air without evaporation. This is readily done by the use of two vacuum test-tubes, fitting freely one inside the other. The smaller one is filled with liquid air, and after the insertion of an india-rubber stopper and glass tube, is completely immersed in liquid air contained in the larger vacuum vessel. This is the most convenient arrangement to use for the production of solid air. For this purpose the tube leading from the outer vessel is connected with an air pump until the pressure is reduced to about $\frac{1}{2}$ inch, and therefore the temperature about -200° C. Then a good air pump is put on to the inner vessel of

liquid air (containing oxygen and nitrogen in the normal proportion of oxygen and nitrogen), by means of the tube connected to the inner vacuum vessel, while maintaining constantly the exhaustion in the outer vessel. In a short time the air in the inner vessel solidifies to a transparent jelly-like mass.

The same principle is used when the latent and specific heats have to be determined. Now a definite quantity of heat has to be conveyed into the inner vacuum vessel containing liquid air, with the object of finding the weight of liquid that distils off, on the one hand, or the elevation of temperature in the liquid that takes place on the other. For the purpose of adding a given quantity of heat it is convenient in some cases to use mercury, or to lower a piece of platinum or silver, or even glass, into the inner vessel: each unit of heat supplied evaporates a definite amount of air, which is readily ascertained by collecting the gas which comes off during the heat conveyance. In a latent heat determination all that is necessary is to weigh the mercury added and to measure the amount of air by volume which has distilled from the liquid state. If the specific heat of the liquid is wanted, then the inner vessel is exhausted (as well as the outer) through a tube to about $\frac{1}{2}$ inch pressure, and the three-way stop-cock turned so as to shut off the tube and connect the inner vessel with a manometer. Mercury is now dropped into the inner vessel until the manometer rises to the atmospheric pressure or the liquid reaches its boiling point under atmospheric pressure. Care must be taken to prevent the drops of mercury falling exactly in the same place, otherwise a mercury stalagmite grows up rapidly through the liquid, vitiating the results. Another objection to the use of mercury arises from the drops causing the rebound of small liquid air drops, which strike the cork and get evaporated away from the main body of the liquid. The amount of mercury added conveys the necessary amount of heat needed to raise the given amount of liquid from its boiling point under $\frac{1}{2}$ inch pressure to its boiling point under 30 inches. The relative pressures give the temperature range, and the weight of liquid air or other gas under observation is easily ascertained, together with the weight of mercury added. In this way the latent heat of liquid oxygen at its boiling point is about 80 units, and the mean specific heat between -198° and -182° is 0.39.

Seeing that the most powerful chemical affinities are in abeyance at very low temperatures, it is a matter of great interest to ascertain what change comes over the physical force we name cohesion. Here we are dealing with the molecular forces which are effective in uniting together the particles of solid bodies, in contrast to the force we name chemical attraction, which exists most characteristically between dissimilar molecules. Both are alike in this respect, that they are insensible at sensible distances. If we accept the theory of matter which regards finite heterogeneity of the most homogeneous bodies as proved, then Lord Kelvin has shown that gravitation alone would account for the so-called cohesive forces. Thus, he says ('Popular

* Lecture delivered January 19, 1895.

Lectures,' vol. i., page 60): "But if we take into account the heterogeneous distribution of density essential to any molecular theory of matter, we readily see that it alone is sufficient to intensify the force of gravitation between two bodies placed extremely close to one another, or between two parts of one body, and therefore that cohesion may be accounted for, without assuming any other force than that of gravitation, or any other law than the Newtonian." Another view of the cohesive forces is taken by Mr. S. Tolver Preston, in his work entitled 'Physics of the Ether,' page 64. He says, "The phenomena of 'cohesion,' 'chemical union,' etc., or the general phenomena of the aggregation of molecules, being dependent on the molecular vibrations as a physical cause, it would therefore be reasonable to conclude that variation of vibrating energy (variation of 'temperature') would have a most marked influence on these phenomena, as is found to be the fact. Further, since when a physical cause ceases to exist the effect also ceases, it follows that at the absolute zero of temperature (absence of vibrating energy) the general phenomena of 'cohesion,' including the aggregation of molecules in chemical union, would cease to exist." If this theory is pressed so as to include the gaseous state, then at the temperature of -274°C . we may imagine the particles reduced to an incoherent layer of dust or powder. The experimental facts do not, however, warrant this conclusion, seeing that at the lowest temperature reached, which is about -210°C ., air remains a transparent jelly. That a low temperature causes profound changes in the elastic constants of a metallic body is most easily shown by placing a rod of fusible metal in liquid air, and comparing the deflection produced by a weight when the rod is supported at one or both ends before and after cooling.

The Young modulus is increased to between four and five times its amount at ordinary temperatures. In the same way, the rigidity modulus can be shown to be greatly changed by cooling a spiral spring made of fusible metal wire. Such a spring at the ordinary temperature is quickly drawn out into a straight wire, by attempting to make it support an ounce weight. The same spiral, cooled to -182°C ., will support a couple of pounds, and will vibrate like a steel spring so long as it is cool. In the same way, a bell or tuning fork of fusible metal gives a distinct metallic ring at -180° . If two tuning forks are taken of identical pitch, and one cooled to -182° , then on simultaneously striking them beats are very distinctly heard. The simplest plan of getting some idea of the change in the cohesive force at low temperatures, is to ascertain the tenacity or breaking stress of the metals and alloys under such conditions, and to compare such results with similar experiments made at the ordinary temperature with the same metallic samples, using the same apparatus. In this way the comparative values are reliable. The only difficulty is the large quantity of liquid air or oxygen required to cool the steel supports of the wires, which have to be broken. Seeing that wires less than $\frac{1}{16}$ inch in diameter are unreliable, good strong rigid steel supports are needed, and as these have to be cooled each time a wire is broken,

the experiments involve large quantities (gallons) of liquid air and oxygen. Further, as not less than three, and in many cases six experiments must be made with each sample of wire, and the stress in each case can only be applied slowly, work of this kind extends over long periods of time, and this means increased waste of liquid gases. The following table gives the mean results of a large number of experiments:—

Table I.—*Breaking Stress in Pounds of Metallic Wires 0.098 Inches Diameter.*

	15°C. —	182°C.
Steel (soft).....	420	700
Iron	320	670
Copper.....	200	300
Brass.....	810	440
German silver	470	600
Gold.....	255	340
Silver	330	420

An inspection of this table proves that all the common metals and alloys increase in tenacity at low temperatures: thus iron has doubled its breaking stress, and the other metals and alloys are all increased from a third to a half the normal amount. This increase of strength is solely due to the low temperature, and persists only during its continuance. Wires that have been cooled to the temperature of -182°C . and allowed to regain the ordinary temperature, are in no way changed as regards their breaking stress.

A second series of experiments were made with a set of cast test pieces of metals and alloys. The test pieces, all cast in the same mould, were 2 inches long with $\frac{1}{2}$ inch spherical ends, the cylindrical portion being $\frac{2}{10}$ inch diameter. The spherical ends of the test pieces rested in similar cavities made in a special set of steel supports that fitted on to the testing machine. Crystalline metals give castings that are far from uniform one with another, and it is very difficult to get even comparable results with metals like zinc, bismuth, and antimony. The following table gives the experimental results:—

Table II.—*Breaking Stress in Pounds of Cast Metallic Test Pieces. Diameter of Rod 0.2 Inch.*

	15°C. —	182°C.
Tin	200	390
Lead	77	170
Zinc.....	35	26
Mercury	0	31
Bismuth	60	30
Antimony	61	30
Solder.....	300	645
Fusible metal (Woods)	140	450

It will be noted that in this list the breaking stress, by cooling to -182°C ., has been increased to three times its usual value in the case of fusible metal, and to twice its usual value in the case of tin, lead and solder. The results with zinc, bismuth, and antimony are exceptional, seeing they appear to be diminished in tenacity. This, however, may be only apparent, because the stresses set up in cooling such highly crystalline bodies probably weaken some set of cleavage planes, so that rupture is then comparatively easy. In any case it must be admitted that no reliance can be placed on the tenacity of highly crystalline metals. The breaking stress of mercury is

interesting, and turns out to be at -182°C . nearly half that of lead at the ordinary temperatures. The percentage elongation is not given in the foregoing tables, simply because the value of such measurements is of little importance when such short pieces of the metals are under observation. The general results of such observations are, however, interesting: thus, lead and tin at ordinary temperatures elongate before breaking about the same amount, whereas if tin is cooled to -182°C . it hardly shows any extension, and lead under such conditions shows no change, stretching as much at -182° as at 15°C . Solder and fusible metal stretch less, and the cross section of the break is much less at -182° than at 15°C . The above experiments can only be considered as preliminary to a more elaborate investigation of the actual variation of the elastic constants at low temperatures. It will require complex experimental arrangements to get reliable measurements of the Young modulus and the rigidity modulus at the temperature of boiling liquid air. In the case of fusible metal, a first attempt to compare the ratio of the Young modulus at 15° and -182° with the ratio of the rigidity modulus between the same limits of temperature, has resulted in finding that both constants are increased in the same proportion. From this it would follow that the resistance to compression of the substance at -182°C . must be increased in a similar ratio. The comparative behaviour of strong steel spirals at 15°C . and -182° as to their elongation on the repeated addition of the same load was a subject examined on several occasions. The most careful comparison of such spirals, however, revealed no measurable differences in their elongation between the ordinary temperature and that of boiling oxygen. This may be due to the want of sufficient sensibility in the testing-machine when applied to such delicate experiments. In the meantime it is reasonable to conclude that the rigidity modulus of very hard steel is not much changed by cooling it to -182°C . If balls of iron, tin, lead or ivory are cooled to -182°C . and dropped from a fixed height on a massive iron anvil the elastic rebound is markedly increased in all cases. The flat distortion surface produced on the lead sphere after impact is only one-third the diameter of the circular surface produced at the ordinary temperature when the lead ball falls from the same height.

The examination of the magnetic condition of matter at low temperatures is a subject of great interest and offers a wide field for investigation. In a former lecture the magnetic properties of liquid oxygen and air were discussed. Owing to the experimental difficulties, accurate quantitative measurements of the permeability have not yet been successful. Faraday was the first experimenter who examined the magnetic condition of matter at the lowest temperature that could be commanded in his time, viz., about -110°C . He did not succeed in making any substance which was non-magnetic at ordinary temperatures assume the magnetic state at the lowest temperature of the solid carbonic acid ether bath in vacuo. Later experimenters have directed their attention more especially to the action of high

temperatures on magnetism, and the work of Professors Hopkinson and Ewing in this field of research is well known. Professor Trowbridge examined the effect of a temperature of -80°C . on a permanent magnet, and came to the conclusion that the magnetic moment was diminished by about 50 per cent. Professor Ewing found that an increase of temperature of 150°C . above 10° caused a reduction of the magnetic moment of a bar magnet by about 40 per cent., and that the magnet on cooling recovered its original state. This result would lead us to expect that if the same law is followed below the melting point of ice as Ewing found above it, then a bar magnet cooled to -182°C . ought to gain in magnetic moment something like 30 to 50 per cent. The experiment of Professor Trowbridge is, however, apparently opposed to such an inference. It appears, however, that Professor Trowbridge cooled a magnet that had not reached a constant state (that is to say, one that on heating would not have completely recovered its magnetisation on cooling), because after the magnet had been cooled to -80° on regaining the ordinary temperature, it had lost 50 per cent. of its original magnetic moment. Such a magnet would apparently diminish in magnetic moment on cooling and heating the first time the action was examined, but a repetition of the process when the action of magnetisation and temperature were strictly reversible might lead to an opposite conclusion. To settle this question a series of experiments on the magnetic moment of small magnets cooled to -182° were carried out. Small magnets from half an inch to an inch in length were made of watch-spring or steel wire and were either used separately or in bundles; they were fixed rigidly in a block of wood by means of copper staples, and in this condition were easily clamped firmly in the field of a magnetometer. The cooling was effected by applying a cotton-wool sponge of liquid air. The relative deviations of the magnetometer are proportional to the magnetic moment of the magnet under the respective conditions of $+15^{\circ}$ and -182°C . After the first cooling the magnet is allowed to regain the ordinary temperature, and the operation of cooling and heating is repeated three or four times. The following table gives some of the results, and these may be taken as typical of a large additional number unrecorded.

If the experiment marked (1) is examined we find cooling to -182° in the first cycle produced no change of magnetic moment, but that on heating to $+15^{\circ}\text{C}$. the magnet had lost 30 per cent. of the original strength. In the second cycle cooling increased the magnetic strength of the magnet, in the condition in which it is left after the first cooling by 33 per cent., and heating diminished it by 5 per cent.; whereas in the third cycle cooling showed 36 per cent. increase and no loss in heating. It was only after three alterations of temperatures from $+15^{\circ}$ to -182°C . that the magnet reached a steady condition. In experiment (3) the first cooling shows a loss of 24 per cent., while in experiment (4) the first cooling shows a gain of $12\frac{1}{2}$ per cent.

Change of the Magnetic Moments of Permanent Magnets at $+15^{\circ}$ and -182°C . per cent. of the

value at the beginning of each cycle, which is always 15°.

- 182° C. + 15° C.

(1) Hard steel, 0.5 inches long and 0.4 inches diameter.

First Cycle.....	+ 0	- 30
Second „	+ 33	- 5
Third „	+ 36	0

(2) Soft steel.

First Cycle.....	+ 12	- 28
Second „	+ 51	0
Third „	+ 51	0

(3) Hard steel, 1.03 inches long, 0.4 inches diameter.

First Cycle.....	- 24	- 43.4
Second „	+ 23	0
Third „	+ 23	0

(4) Nine steel wires in bundle.

First Cycle.....	+ 12.5	+ 3
Second „	+ 38	- 2
Third „	+ 33	0
Tested four days after.		
First Cycle.....	+ 50	0

It is clear, therefore, that according to these experiments, every magnet has individual characteristics that may either result in no change on cooling or the addition or subtraction of from 12 to 24 per cent. in the magnetic strength. All the experiments, however, show that a repetition of the cycle of heating and cooling brings the magnet to a steady state, in which cooling always causes increase in the magnetic strength of from 30 to 50 per cent., and the re-heating brings about no loss in the original magnetic moment. Such a marked alteration of magnetic strength might be used as a thermometer in low temperature research, and it is my intention to extend the inquiry to the lowest temperature that can be reached by the evaporation of nitrogen in vacua. A simple mode of showing the sudden alteration of magnetic strength on cooling is to surround a permanent magnet made up of a bundle of steel wires with a coil of copper wire, leaving the ends of the magnet to project so that they can be dipped in liquid air. When the copper wires are attached to a galvanometer, and one of the ends of the magnet cooled, an induced electrical current occurs, due to the sudden magnetic change. Accurate observations must be made on the permeability and susceptibility of the magnetic metals at the temperature of boiling liquid air, and the above results are an indirect guarantee that this field of investigation will be fruitful in new scientific facts.

This lecture has already covered a very wide field. It is easy to put into a Friday evening discourse the work of a year. Members and friends have chiefly contributed to the Research Fund, which has enabled the Institution to extend the experimental plant needed for the prosecution of research in this field of inquiry, and they have strong claims to learn, in the first instance, the results of the general laboratory work. My object has been to illustrate the scientific uses of liquid air. To do this with any satisfaction requires what may be called a good deal of scientific prospecting. It is one thing to discover where the ore lies, it is another thing to produce the refined

metal. Investigations on the properties of matter at the temperature of boiling liquid air must be in the first instance rather qualitative than rigidly quantitative. In my opinion scientific progress is best served by conducting the inquiry on these lines. It will be easy to refine later on.

I have to acknowledge the great assistance I have received in the conduct of these experiments from my excellent chief assistant, Mr. Robert Lennox, and I must also express commendation of the way Mr. Heath has helped in the work.

WESTERN CHEMISTS' ASSOCIATION.

An adjourned meeting of the Western Chemists' Association (of London) was held on June 19, when the President (Mr. R. H. Parker) re-opened the discussion on "The Present Phase of the Poisons Law." He recapitulated the proceedings of the previous meeting (see *Ph. J.*, page 1076), claiming the necessity of establishing pharmacy on a clearer and more logical basis than the recent interpretations of the Pharmacy Acts afforded. He said the subjects urgently demanding consideration in a new Pharmacy Bill were:—

1. *Company Pharmacy and the Protection of Titles.*—The right of a properly constituted limited liability company to own a pharmacy which is under the immediate personal control of a qualified chemist, had been supported by several legal decisions, and could not now be logically objected to, but he maintained strongly that the use of the title "Chemists and Druggists," as applied to any company not consisting entirely of qualified chemists, should be powerfully opposed, so as to confine their use of the title to the personality of their qualified manager.

2. *Branch Shops and Medical Dispensaries.*—Every one of these (excepting private dispensaries of medical practitioners) should have a qualified chemist as *bonâ-fide* manager, responsible for one establishment only.

3. *The Restriction of Dispensing* to qualified chemists (medical practitioners being allowed to dispense for their own patients only).

4. *The Poisons Schedule* needs to be rid of the ambiguity of the term "preparations" in Part I.; all potent "preparations" should be enumerated in Part I., the rest being described in Part II. as "other preparations not enumerated in Part I."

5. *Examinations.*—The First or Preliminary examination should be much more stringent than it is at present, and the Minor should be divided into "Intermediate" and "Qualifying" sections, so that an assistant on passing the former would be permitted to sell and dispense poisons during temporary absence of the principal; that a thoroughly competent and careful assistant of perhaps eight or ten years' experience in pharmacy should, from a legal point of view, not be trusted to sell a packet of oxalic acid or dispense a prescription for belladonna liniment without supervision was an anomaly, the absurdity of which was not only evident, but extremely inconvenient, to the majority of chemists.

He thought that company pharmacy and the branch

shops difficulty would be best met by the following regulations:—

"Every pharmacy (or place where poisons are sold or dispensed) should be registered, and a record kept of its owner or owners; if not actually conducted by its owner, then the name of its *bond fide* manager should be known. This triple record should be corrected annually by a personal visit from the local secretary. A penalty should be incurred by any owner of a pharmacy who failed to conform with this regulation.

"Every such pharmacy should be personally conducted by a qualified manager (who may be the owner) responsible, as regards his assistants as well as himself, for the proper conduct of that pharmacy only; his managership certificate should be cancelled for gross inattention or misconduct."

The resolution embodying these suggestions as submitted to the last meeting (see p. 1076) was then read.

Mr. Butt pointed out that the danger following the existence of the bogus company (or, as it is called, the one-man company) had fairly ceased to exist, for the opinion was rapidly gaining ground among lawyers that such concerns were distinctly evasive, and therefore illegal. As regards qualified managership, he did not think there was need for further legislation, as the present Act was made to apply so closely, that practically no chemist's business could be carried on without a qualified manager, and if anybody knew of such being done, and would communicate with the Secretary of the Pharmaceutical Society, he felt sure it would soon be stopped. He did not think it would be advisable to divide the examination.

Mr. Spyer insisted on the importance of carrying out the requirements of the Poisons Schedule to the full extent—it protected the public and impressed them with the importance of the restrictions.

Mr. Allen agreed with the earlier portion of the proposed resolution, but claimed that an assistant's qualification to permit taking sole charge of a pharmacy for a day or for a fortnight would speedily be recognised by lawyers as sufficient for the whole year; it would therefore lead to the reduction of the educational standard. Nor could he agree with the proposed alteration of the Poisons Schedule—as a matter of fact, the word "preparations" was not now recognised by the lawyers; the judges could not distinguish between quantities, and held that when a man sold a solution of a poison he sold the poison, and the requirements of the Act must be complied with accordingly. He would, therefore, suggest as an amendment that the resolution should read:—

"That this meeting, while supporting the policy of the Council of the Pharmaceutical Society in its administration of the Pharmacy Act under recent interpretations, is of opinion that future legislation should be directed towards: (1) the conjoint registration of every pharmacy with the name of its qualified manager and of its owner or owners; the manager to be held responsible for its proper conduct, and together with the owner or owners for any pecuniary penalties that may be incurred; (2) the restriction of dispensing medical prescriptions to registered pharmacies, and (3) the raising of the standard of the First or Preliminary examination."

Mr. Hyne seconded the amendment.

The President, in putting the amendment to the meeting, said he had been under the impression that there were still many chemists' businesses and open surgeries, especially in the north, which were under the management of apprentices or unqualified assistants. He was glad to learn that such was not the case to any great extent, and would soon be a thing of the past. The significance of the word "preparations" could not be logically ignored by the lawyers as long as the present Poisons Schedule existed, for the fact that "corrosive sublimate" stands alone in Part I., and "preparations of corrosive sublimate" in Part II., clearly showed that a preparation of a poison is not the poison within the meaning of the Act.

The amendment, being supported by a considerable majority, was put as the substantive resolution and carried.

CHEMICAL SOCIETY.

The final meeting of the present session was held on Thursday, June 20, the President, A. Vernon Harcourt, F.R.S., in the chair. An extraordinary general meeting was held immediately preceding the ordinary meeting, when the following alterations in the bye-laws were unanimously made: "That the life composition fee shall be £30, with certain exceptions, such as Fellows, who, having paid their subscription for a certain number of years, were allowed to compound for a less amount." At the ordinary meeting the following papers were read:—

ON LINTNER'S ISOMALTOSE.

BY H. BROWN, F.R.S., AND G. H. MORRIS, PH.D.

Some years ago Fischer* described a new sugar, isomaltose ($C_{12}H_{22}O_{11}$), obtained in addition to maltose by the hydrolysis of starch. This isomaltose was more recently examined by Lintner,† who gave a full account of the method of preparation, described its osazone and gave certain physical constants as the crystalline form, melting point, etc. More recently, however, Ling and Baker‡ have investigated the question, and arrived at the conclusion that isomaltose is a mixture of maltose with probably two other substances, one of which they separated and described as amylotriose, $C_{12}H_{22}O_{12}$.

The authors of the present paper being dissatisfied with the nature of the proofs adduced for the homogeneity of isomaltose, and having proved that malto-dextrin, as well as maltose, is produced during the hydrolysis of starch by diastase, undertook the re-investigation of Lintner's isomaltose. This work was rendered the more necessary since most chemists seem to have accepted the statement that isomaltose is one of the products of starch hydrolysis. The experimental data, upon which the proofs for the existence of isomaltose rest, are the isolation of an osazone by fractional precipitation different in crystalline form, melting point, etc., from malt-osazone. It is noted, however, that there is not the same relation between the optical activity and

* *Berichte*, xxiii., 3689.

† *Berichte*, xxvi., 2568.

‡ *Pharmaceutical Journal* [3], 1896, p. 630.

cupric reducing power of this sugar as has always been noted in other sugars. This would give rise to the suspicion that isomaltose is a mixture and not a pure substance. The authors prepared a large quantity of iso-malt-osazone by Lintner's method, which agreed in all respects with that described by him. On fermenting isomaltose only a portion suffered hydrolysis, and though this might be due to the presence of two stereo-isomeric modifications of isomaltose, one of which was fermentable, the other not, experiments showed that this explanation was untenable. The non-fermentable residue did not yield an osazone, but gave the reactions for a malto-dextrin. Moreover, the optical activity and cupric reducing power of the isomaltose and the fermentable and non-fermentable portions showed that isomaltose was a mixture of two different substances and not stereo-isomers. Isomaltose can, however, be completely hydrolysed by the continued action of diastase. All this evidence pointed to the conclusion that isomaltose is a mixture of maltose and a malto-dextrin. This was finally proved by mixing maltose and malto-dextrin, and adding phenylhydrazine, when an osazone identical in all respects with iso-malt-osazone was obtained. Thus, though malto-dextrin alone yields no precipitate with phenylhydrazine, when mixed with maltose the osazone produced differs considerably from malt-osazone.

The proof that Lintner's isomaltose is a mixture of maltose and a malto-dextrin is thus in two parts: (i.) by separating the components by fermentation or other means; (ii.) by forming an osazone identical with iso-malt-osazone from maltose and malto-dextrin.

TRANSFORMATION OF AMMONIUM CYANATE INTO UREA.

BY PROFESSOR WALKER AND J. F. HAMLEY.

The authors have investigated the rate of change of ammonium cyanate into urea, and have found that it varies with the temperature, the higher the temperature the quicker being the change. In order to determine the rate of change, a solution of known strength maintained at a constant temperature was titrated at known intervals of time by a solution of silver nitrate, and from this the amount of urea formed calculated. It was found that the action is reversible, i.e., that ammonium cyanate undergoes change into urea, whilst a certain amount of urea undergoes change into ammonium cyanate. This was proved by boiling a solution of urea and then adding silver nitrate, when a precipitate is obtained showing the presence of ammonium cyanate. When the solution is in equilibrium, i.e., no further change takes place, there is about 95 per cent. of urea and 5 per cent. of ammonium cyanate present. If the change is a simple one the velocity constant should

be equal to $-\log \frac{A}{A-x}$ where t = time of reaction,

A = mass of ammonium cyanate originally taken, and x = mass changed in t seconds. Experiments showed, however, that the velocity constant is

$\frac{1}{t} \log \frac{A}{A-x}$, and this is the equation for a change in

which two molecules interact. The formation of urea must therefore be due to the interaction of two molecules which must be present in equivalent proportions, and therefore the other molecule cannot be water. Three explanations are possible: (i.) that one molecule of ammonium cyanate reacts with another molecule; (ii.) that ammonium cyanate undergoes dissociation into ammonia and cyanic acid; (iii.) that it undergoes electrolytic dissociation into the ions NH_4 and CNO . The latter of these explanations was proved to be the correct one. The addition of ammonium sulphate greatly increased the velocity constant so that the first explanation cannot be true. Both (ii.) and (iii.), however, would explain the alteration due to the addition of ammonium sulphate. If it is due to electrolytic dissociation, the addition of ammonia will hardly affect the constant, since ammonia undergoes very slight electrolytic dissociation; on the other hand, if the second explanation be true, the rate should be altered by the addition of ammonia. Experiments showed that with ammonia there was scarcely any change, so that in solutions of ammonium cyanate we have electrolytic dissociation into the ions NH_4 and CNO .

FORMATION OF UREA.

BY H. J. H. FENTON.

The author had arrived at the above results by experiments conducted in a slightly different manner, and published in the *Proceedings of the Chemical Society of Cambridge*. The amount of change at any given time was determined by treatment with sodium hypobromite and measurement of the nitrogen evolved, since urea yields all its nitrogen on this treatment, and ammonium cyanate only yields half. From these data the amount of change can be calculated.

SOME DERIVATIVES OF HUMULENE.

BY A. C. CHAPMAN.

In previous papers, humulene, $\text{C}_{15}\text{H}_{24}$, a hydrocarbon—sesquiterpene—found in oil of hops, has been partly described*; it has now been further examined. The nitroso-chloride heated with piperidine yields a nitro-piperide, which forms a crystalline hydrochloride and well-defined platinumchloride. The nitro-piperide with benzylamine yields a nitro-benzylamine.

Humulene treated with nitrous acid, by mixing with sodium nitrite and adding glacial acetic acid, yields a deep blue-coloured substance, which soon turns green and from which crystals of a bluish-green colour, humulene nitrosite, separate. From the mother liquors, however, colourless crystals were obtained of an isomeric substance, and it was shown that on boiling the blue compound with alcohol it passes first into the green substance and then the colourless isomer.

The difference is probably due to the presence of the groups $\text{R}'\text{NO}$ and $\text{R}\cdot\text{N}\cdot\text{OH}$.

* Journ. Chem. Soc., lxvii., 51.

NOTE ON THIO-DERIVATIVES OF SULPHANILIC ACID.

BY MISS WALTER.

Certain new derivatives were described of aniline and sulphanilic acids as a sulphethide of formula $(C_6H_4 \cdot SEt \cdot SO_2K \cdot 1.4)$, and a disulphite of formula $C_6H_4(SO_2Et)_2$, and the corresponding sulphochloride and sulphonamine.

HELIUM.

BY PROFESSOR RAMSAY, F.R.S.

For the preparation of this gas thirty-five to forty minerals have been examined, and the gases contained in them obtained and analysed. The gases found were carbon dioxide, hydrogen, hydrocarbons, etc., and helium, but never argon. Three methods were employed to obtain the gas from the mineral.

(1) The mineral was enclosed in a tube of hard glass which was connected to a pump, the tube raised to the highest possible temperature, and the gas evolved pumped out and collected.

(2) The mineral is fused with potassium hydrogen sulphate, and the gases collected as in method (1).

(3) The mineral was boiled with sulphuric acid and water, and the whole conducted in a stream of carbon dioxide.

The resulting gases obtained by one or other of these methods are passed through soda, then mixed with oxygen and sparked for a long time over mercury. The resulting gas is absorbed by soda, and after all the nitrogen is absorbed the residual gas is transferred to a vacuum tube and the spectrum examined. The helium spectrum is very characteristic and contains five bright lines: (1) brilliant red; (2) D_2 , the yellow helium line observed in the solar spectrum; (3) peacock blue; (4) blue; (5) violet. It is curious that two lines in the red portion of the spectrum are identical with two of the lines in the spectrum of argon. Fourteen or fifteen minerals have been found to contain helium, but some of these contain only the slightest trace, 70 grains of a uranium ore from Cornwall, for example, yielding only 0.5 C.c. of the gas. The best sources for the gas are clèveite and bröggerite, both oxides of uranium with other constituents.

Uraninite yields 10 to 12 per cent. nitrogen as well as helium, whilst clèveite contains no hydrogen, and there is not therefore a hydride of helium. The density of the gas as determined by prolonged passage of the gas over heated magnesium, copper, and drying by phosphoric anhydride is 2.2. The author had previously stated that the density was certainly not more than 8.9 but had not given this number as the density of the gas, but only a maximum value. Further purification reduced the density to 2.2 but this number appeared constant. The ratio of the specific heats of the gas determined by the velocity of sound in the gas by Kundt's method was found to be 1.65 and this proves that the gas is monatomic.

The solubility of the gas in water was determined, and helium was found to be the least soluble of all gases, the coefficient of solubility being .007, or about half that of hydrogen. From comparison of the spectra of argon and helium it is possible that

both these gases are a mixture, but no method has yet been devised for testing this theory.

Helium combines with platinum, as is shown by passing a current through a vacuum tube containing helium, when the tube becomes phosphorescent, due to the formation of a vacuum caused by combination of helium with platinum.

The non-existence of helium in the atmosphere may be due to its very low density, and thus diffusion would take place very rapidly and the gas leave the atmosphere and be attracted to some other great mass such as the sun.

No satisfactory explanation can be given as to how the helium came to be present in these minerals.

The following papers were taken as read: "The Chlorination of Ortho-chloro-toluene," by W. P. Wynne, D.Sc., and A. Greaves; "The Six Dichloro-toluenes," by W. P. Wynne, D.Sc., and A. Greaves; "The Disulphonic Acids of Toluene and of Ortho- and Para-chloro-toluene," by W. P. Wynne, D.Sc., and J. Bruce; "Ethereal Salts of Ethane-tetracarboxylic Acid," by Professor Walker, D.Sc., and J. R. Appleyard; "A Method for Preparing Formyl Derivatives of Aromatic Amines," by H. R. Hirst and J. B. Cohen, Ph.D.; "A Modification of Zincke's Reaction," by H. R. Hirst and J. B. Cohen, Ph.D.; "A New Method of Preparing Cyanuric Acid," by W. H. Archdeacon, B.Sc., and J. B. Cohen, Ph.D.

Correspondence.

[Letters to the Editor should be written as concisely as possible, on one side of the paper only, and preferably with name and address for publication.]

QUALIFICATIONS OF PUBLIC DISPENSERS.

Sir,—Your article in last week's Journal on the Local Government Board Order relating to the qualification of public dispensers deserves the serious consideration of the pharmaceutical body. In the first place the possessor of the "Hall" qualification and the Army Medical compounder are placed by that Order on an equal footing with the chemist and druggist, although, as you justly observe, the course of training and educational attainments of the latter are vastly superior.

The difference is more especially marked in the case of the Army compounder who has received a very limited training in a more or less narrow groove, and it is eminently undesirable to transfer such a one to the entire control of a union dispensary, where he will be under such different conditions to those he has been accustomed to. For the union dispenser is left in entire charge of the dispensary as a rule, and it is difficult to see why a lower qualification than that demanded for the retail chemist and druggist, on the grounds of public safety, should be considered good enough for the dispenser in an institution where hundreds of poor patients receive their medicine.

On the ground of economy, too, the lower qualification should not be accepted, for the better educated and trained the dispenser is, the more intelligence he may be expected to bring to bear upon his daily duties, and less unsatisfactory work due to paucity of knowledge and experience will assuredly result. Any pharmacist who has taken apprentices or had the misfortune to employ incompetent assistants will appreciate the importance of this point.

St. Thomas's Hospital, S.E.

EDMUND WHITE.

Notes and News.

COLORATION OF PILLS.—A correspondent of the *British Medical Journal* would have pills coloured so as to indicate their active ingredients. Thus pills containing strychnine should be pink, purgative pills blue, opium some other distinctive colour, and so forth. The idea might be improved upon by varying the shades of the colours used to indicate different strengths, and substances for which no simple colour was available might be distinguished by combinations of two, three, or more colours. Seriously, however, the tendency to increase such purely mechanical safeguards is not worthy of encouragement. The results might be far from satisfactory if, under the proposed arrangement, some strychnine pills should be accidentally sent out another colour than pink.

CATERPILLAR OPHTHALMIA.—Caterpillars are not usually regarded as a source of disease, but at the last meeting of the Ophthalmological Society a case of the so-called "ophthalmia nodosa" was brought forward. It appears that the hairs of certain kinds of caterpillars, when made to penetrate the conjunctiva, set up a long-standing inflammation of the tissues of the eye, which may result in a considerable impairment of vision. At this season of the year, when caterpillars abound, it should be remembered that they may prove dangerous if used as missiles; if the eye has been injured in such a way, the *British Medical Journal* recommends that the conjunctiva should be examined by a magnifying lens, and the extremely fine hairs removed.

LATIN IN PRESCRIPTIONS.—The *Alumni Report* does not agree with the notion that the use of Latin in prescriptions is necessarily a source of error. It is allowed that to use poor Latin, to abbreviate badly, and to write unintelligibly may lead to errors and endanger life, but that is the fault of the writer, not of the language. The use of Latin is advantageous in that it is a comparatively unfamiliar language, and so enables the physician to prevent his patients reading the prescriptions given to them, but it is of even greater value in that it is not susceptible to change, and latinised names are practically universal. At the same time the value of Latin in prescription writing depends wholly upon its proper use.

MORE NEWSPAPER SCIENCE.—The *Westminster Gazette* reports that a few days ago all the fish in the pond surrounding the Diana Fountain in Bushy Park were discovered to have been poisoned by the water having been impregnated with what appears to have been prussic acid (*sic*). Several of the fish have been sent to the divisional surgeon at Kingston for analysis, and all the poisoned water has been drained off and the remainder of the fish destroyed. "A theory prevails that a young chemist from London, who committed suicide in the park by poisoning a short time ago, may have poured some of the poison into the pond as he passed it." It is needless to say that this strange persistence of the prussic acid is not explained.

MEDICAL FREEMASONS.—The Rahere Lodge of Freemasons, No. 2546, is to be consecrated at St. Bartholomew's Hospital on Saturday afternoon, June 29, and the Prince of Wales is expected to be present on the occasion. The Secretary, Mr. T. G. A. Burns, 25, Welbeck Street, W., will be glad to hear from Freemasons, now or formerly connected with the hospital, who desire to be present. On August 1 also, a smoking concert will be held at the Portman Rooms, Baker Street, W., in connection with the Æsculapius Lodge and Chapter, and in honour of medical Freemasons attending the meeting of the British Medical Association. Tickets can be obtained from the Honorary Secretary, Dr. T. Dutton, 7, Portland Place, W.

OPIMUM AND OTHER VAPOURS.—A correspondent of the *Lancet* thinks the rational use of opium as vapour is worthy of consideration. Great improvements, however, should be made in the official "vapoars," the scientific principles on which evaporation depends and their application requiring to be carefully studied if good is to be effected. At present these preparations afford the "most curious evidence of ignorance that can be quoted from the Pharmacopoeia."

"PATERNAL" GOVERNMENT IN FRANCE.—The French Government, despairing of any hope to increase the birth-rate in that country, is now devoting its energies to saving those already born. The new law forbids, under a severe penalty, any one to give infants under one year any form of solid food unless such be ordered by a written prescription signed by a legally qualified physician.

PERMANGANATE IN OPIUM POISONING.—Dr. William Moor, of New York, returns to the charge on this subject in last week's *British Medical Journal*, where he claims to have destroyed a grain of morphine sulphate dissolved with 260 grains of white of egg in an ounce of water, by adding rapidly to the whole one grain of potassium permanganate dissolved in an ounce of water. This, added to the results of experiments upon himself, leads him to the conclusion that the contents of the stomach will not reduce the permanganate so quickly after administration as to render it useless for antidotal purposes.

CHLORAL HYDRATE FOR EPSOM SALTS.—A case which came before the Clerkenwell magistrate last week revealed extraordinary carelessness and ignorance in the administration of medicine. A labourer living in the Gray's Inn Road accidentally caused the death of his wife by giving her a dose of chloral hydrate. His wife asked him for some salts, whereupon he went to the surgery of a veterinary surgeon by whom he was employed, and helped himself to what he thought was Epsom salts, but was really chloral hydrate, and mixed three teaspoonfuls of it in water. The poor woman drank it, complained that it burnt her mouth, and died shortly after her husband got her into the hospital.

English News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

SHOPBREAKING AT ST. HELENS.—During the night of Tuesday, June 18, an entrance was effected into the shop of Mr. R. Smith, chemist and druggist, Old Market Place, St. Helens, and the place thoroughly ransacked. About fifty shillings was taken in cash, and an assortment of magnifying glasses, hair brushes, teething powders, bottles of scent, etc., etc. The thieves had evidently used skeleton keys and entered by the front door.

SOCIETY OF ARTS CONVERSAZIONE.—The galleries of the South Kensington Museum were well filled on Wednesday evening, June 19, by a large and distinguished gathering on the occasion of the conversazione of the Society of Arts. The guests on arriving were received in the central corridor of the Museum by Major-General Sir John Donnelly, Chairman, and other members of the Council, and on scattering through the galleries found that their entertainment had been well catered for. Promenade concerts were given by the band of the Royal Artillery in the North Court, and by the Red Band in the Textiles Court; a concert of glees, madrigals, and part songs, under the direction of Mr. Stanley Smith, was enjoyed in the Lecture Theatre; while in the East Architectural Court was found a vocal and instrumental concert by the Royal Criterion Handbell Ringers and Glee Singers, under the direction of Mr. Harry Tipper; and the important department of light refreshments was situated in the central corridor. The reception of guests commenced at nine o'clock, and General Donnelly and the Council were kept hard at work until past ten by a constant flow of arrivals.

MIDLAND PHARMACEUTICAL ASSOCIATION.—The following appointments have been made by the Council of this Association for the ensuing year:—President, Mr. R. Darton Gibbs; Vice-Presidents, Mr. F. J. Gibson (Wolverhampton), and Mr. T. W. Chapman; Hon. Librarian, Mr. J. Barclay, B.Sc.; Hon. Treasurer, Mr. F. H. Prosser; Hon. Auditors, Mr. C. Corfield, and Mr. J. Wakefield; Hon. Secretary, Mr. O. F. Jarvis. Mr. R. D. Gibbs and Mr. C. Thompson were appointed delegates to the meeting of the "Federation" at Bournemouth.

BOTANICAL RAMBLE NEAR SHEFFIELD.—The students of the Sheffield College of Pharmacy, accompanied by the principals, took a botanical ramble to Conisbro' on Thursday last. This place, which is some fourteen miles from Sheffield, is famed for its Castle, which Scott has immortalised in 'Ivanhoe.' Most of the party took boat on the Don in search of *Conium*, which grows plentifully along its banks. Among the specimens collected may be mentioned, *Listera ovata*, *Habenaria alba*, *Epipactis palustris*, *Helleborus fatidica*, and *Sanicula europaea*.

DEATH OF DR. WILLIAMSON.—Dr. W. Crawford Williamson, F.R.S., formerly Professor of Botany at Owens College, Manchester, died on Sunday at his residence, Elms Road, Clapham. According to the *Standard*, Dr. Williamson was born on November 24, 1816, at Scarborough, and was, therefore, in his seventy-ninth year. His father was an enthusiastic Yorkshire geologist. Dr. Williamson's first paper on organic remains in the Lias of Yorkshire was published in 1834, when he was only eighteen.

His scientific activity has thus extended over a period of sixty years. In 1836 he was appointed Curator of the Manchester Natural History Museum, a post which he held while pursuing his medical studies. In 1842 he began to practise medicine in Manchester, where for many years he pursued his profession with great success. He found time, however, for constant scientific work, and his paper on the microscopic objects found in the mud of the Levant (1845) was one of the first memoirs which called attention to the part played by foraminifera in the formation of geological deposits. Dr. Williamson was one of the oldest Fellows of the Royal Society, having been elected in 1854. His later years were devoted to investigations of the structure of fossil plants. His magnificent series of nineteen memoirs on "The Organisation of the Fossil Plants of the Coal Measures," published in the *Philosophical Transactions of the Royal Society*, 1871-1892, constitute the most important body of information on these wonderful remains. In 1874 he received the Royal Medal for his researches on fossil plants, which had then hardly more than commenced. He also received the Wollaston Gold Medal of the Geological Society in 1890. He was a foreign member of several learned societies on the Continent. Dr. Williamson was appointed Professor of Natural History and Geology at Owens College in 1851, and continued to hold the Chair of Botany until 1892, when he resigned and came to London, where his last years were spent in carrying on his varied researches. By his death, English science loses one of the most distinguished naturalists of our time.

"A CHEMIST'S LOVE AFFAIRS."—Under this heading the *Daily Chronicle* reports that at the London Sheriff's Court, Red Lion Square, on June 21, before Mr. Under-Sheriff Burchell and a jury, the case of Bristow v. Purdie, an action to recover damages for seduction came on for the assessment of damages. Plaintiff was the daughter of Mrs. Bristow, a boarding-house keeper, of Westgate-on-Sea, and the defendant was Mr. Percy Wilfred Purdie, 22 years of age, a chemist, of 5, Sun Street, Finsbury, E.C. The action was brought by Mrs. Bristow, on behalf of her daughter, Miss Edith Kate Bristow, to recover £500 damages. Mr. Terrell said the defendant was a young man who was studying to be a pharmaceutical chemist, his father possessing an old-established business in Finsbury. The defendant went to Westgate-on-Sea in the early part of 1894 to serve part of his articles, and whilst he was there he made the acquaintance of the plaintiff, a young lady of some personal attraction. He made love to her in an open way, wrote her a large number of absurd and ludicrous letters, and presented her with poems and sonnets, perhaps of a more ridiculous character than the letters. Eventually defendant left Westgate-on-Sea to go to London to study for his approaching examination. In October, 1894, he wrote to the young lady and asked her to come to London to see him. She did so unknown to her parents, with the result that the defendant managed to seduce her. The plaintiff was not called, and the defendant did not appear. The jury assessed the damages at £150.

WHITE WINE VINEGAR PROSECUTION.—William Day, of Day's Southern Drug Company, Limited, of St. Mary Street, was summoned before the Southampton Borough Bench, on June 21, for selling a certain "white wine vinegar" which was not of the nature, substance, and quality of the article of food so demanded, it consisting entirely of diluted, distilled acetic acid.—Mr. H. D. M. Page applied for the third sample to be sent to Somerset House to be analysed.—The town clerk (Mr. G. B. Nalder) said that he had no objection. The case was adjourned for twenty-

eight days.—William Walter, of Oxford Street, was similarly summoned, and this case was also adjourned for the same length of time.

DEATH OF A LEEDS CHEMIST.—Referring to the death of Mr. Edward Thompson, chemist and druggist, Leeds, announced in last week's Journal, a correspondent states that Mr. Thompson carried on business for about thirty years in Otley, and when retiring, settled in Leeds. In both localities he took much interest in the Mechanics' Institutes of the respective places, serving on their Committees, and being also an active member of the Leeds Naturalists' Club. Mr. Thompson was much esteemed by his brother chemists, and his bright and genial activity of mind made him a favourable example of success in "the art of growing old."

PROPOSED REVIVAL OF APPRENTICESHIP.—An attempt is to be made to revive the system of apprenticeship under which trade in the City of London once flourished auspiciously. Of late years it has fallen into almost complete desuetude. A number of influential gentlemen connected with the City Guilds and commercial undertakings have taken up the subject, and with a view to discussing whether it is possible to initiate a revival, a well-attended conference took place on Wednesday afternoon under the presidency of Sir John Lubbock, M.P., at the Drapers' Hall, in Throgmorton Street. Those present included Mr. S. B. Boulton, Mr. Rokeby Price (Chairman of the Stock Exchange), Mr. W. P. Sawyer, Mr. Crace, Dr. Garnett (Technical Education Board, London County Council), Mr. W. C. Steadman, L.C.C., Mr. J. S. Ballin (Chairman of the Provisional Committee), Sir H. Trueman Wood, Mr. A. G. Arnold, and Mr. G. Code.—The Chairman pointed out that in the past apprentices had played an important element in London life, and they had even played a picturesque and often useful part in English history; but of late that system had somewhat fallen into abeyance. Technical education, too long unduly neglected, was now being recognised more as its importance demanded, and though he was satisfied of the excellence of the work of technical institutes from an educational point of view, still the actual craft or "mystery" (as it used to be termed) was best learnt in the workshop.—Mr. Ballin submitted a scheme for the formation of an institute having for its object the advancement of apprenticeship. It was urged that the aim of such an organisation should be to educate the children in the direction best calculated to increase their earning power, to elevate their moral and physical status, to avoid as far as possible everything calculated to pauperise them, and to raise the standard of excellence in the vigorous handicrafts. In connection with this it was suggested that assistance should be afforded with regard to premiums and loans for purchase of tools, etc.—Mr. Sawyer then moved, and Dr. Garnett seconded, a resolution in advocacy of the system of apprenticeship as being "the best means of education in handicraft."—This was unanimously adopted.—It was further resolved, on the motion of Mr. Rokeby Price, and seconded by Mr. W. C. Steadman, L.C.C., to form an Apprentices' Institution on the basis suggested by the Chairman of the Committee, and an Executive was nominated to assist in carrying out this proposal.

The idea of the promoters of the meeting, says the *Daily Telegraph*, is that parents are now disinclined to apprentice their sons for some years, because they wish them to earn more money at as early an age as possible. It might also be advisable to find out whether the disuse of apprenticeship is not in some part due to the apathy of employers, who are so much pressed in the race for quick production that

they do not find time to give that personal supervision which apprenticeship demands. Such a state of things is almost inevitable in the existing conditions of commerce, and it is, at all events, impossible to expect a return to the picturesque days of the old London apprentices. It is a pity, but it cannot be done. Very likely the advocates of the revival will limit their attention to the payment of premiums for promising youths, with or without return, and the offering of rewards for skilful apprentices. Both ideas are admirable.

COMPRESSED GAS CYLINDERS.—On Wednesday last, Professor Boys, Professor H. B. Dixon, Dr. Dupré, the Rev. F. J. Smith, and Professor Unwin, who have been requested by the Secretary of State for the Home Department to inquire into and report on the manufacture, filling, and use of gas cylinders, met at the Home Office to continue their inquiry. It was begun on the previous day. Professor Unwin was then elected chairman, and in the afternoon a visit was made to Brin's oxygen works. Mr. Coxeter, Mr. Joseph Ralph, and Colonel Majendie laid their views before the Committee on Wednesday.

THE FENCHURCH STREET EXPLOSION.—In consequence of the recent fatal explosion of a compressed gas cylinder containing oxy-hydrogen for a magic lantern, at Fenchurch Street Railway Station, the London and South Western Railway Company has issued the following notice: "Cylinders containing compressed gases will not be accepted for conveyance as passengers' luggage, nor will they be carried by the Company's steamers. Cylinders intended for conveyance must be booked through the parcels or goods offices at the stations. Particulars of the special conditions under which these cylinders are conveyed may be obtained at the office at the time of booking."

A CHEMIST'S APPRENTICE DROWNED.—Mr. J. R. Wood, the City Coroner, held an inquest on Saturday, June 15, at the Courts of Justice, York, on the body of Thomas Stelling Robinson, of Harrogate, who was drowned in the River Ouse at York on Friday. The deceased was 20 years of age, and apprenticed with Mr. Atkinson, chemist, Regent Parade, York. He was sculling on the river on the previous Friday afternoon, when a steamer collided with his boat, and though he could swim a little he sank in a very short while. A verdict of "Accidentally drowned" was returned.

MANUFACTURING PHARMACISTS' OUTING.—The annual outing of the staff and *employés* of Messrs. C. J. Hewlett and Son took place on Saturday, June 22. A large party proceeded at an early hour to Eastbourne, and the morning was spent in excursions to Beachy Head and the neighbourhood. An excellent dinner was served at the Pier Hotel, and the chair was taken by M. J. D. Allman, A.P.S., the senior traveller of the firm. In proposing the toast of "The Firm," Mr. Allman referred to the progress of the firm and the altered conditions of pharmacy during the twenty-five years in which he has represented Messrs. Hewlett and Son. Mr. Tucker, the manager, suitably responded. In the afternoon trips were arranged in sailing yachts and carriages, and London reached at a late hour, after a most enjoyable day. The weather was perfect, and the arrangement carried out in an excellent manner through the liberality of the firm.

R. GODEFFROY (*Oesterr. Zeitschr.*) describes a pyrogallate of barium obtained in fine acicular crystals, by mixing an aqueous solution of pyrogallic acid with excess of solution of barium hydrate. The composition appeared to correspond to the formula $C_6H_4BaO_4 \cdot 4H_2O$.

Scotch News.

EDINBURGH CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.—In connection with the botanical rambles of this Association, a new idea has been started this season with a view to increasing the interest and usefulness of these outings. The plan is to hold a summer meeting of the Association about a week before the arranged ramble takes place, and at this meeting the members are expected to bring forward as many of the plants likely to be met with as they can find opportunity of procuring. The first of these meetings was held in the Pharmaceutical Society's House, 36, York Place, on Wednesday, June 19, Mr. Alexander Sutherland, President, in the chair. Notwithstanding adverse weather, several members had procured a large supply of specimens, and these were laid out for exhibition. The meeting lasted from 8.30 to 10 p.m. During the early part of the meeting members had an opportunity of walking about and examining and discussing the plants, which had been previously named and ticketed. At 9.15 p.m., at the request of the Chairman, Mr. Hill briefly pointed out the chief features of the plants shown. The orders represented were: Ranunculaceæ, Cruciferae, Resedaceæ, Caryophyllaceæ, Linaceæ, Hypericaceæ, Acoraceæ, Geraniaceæ, Leguminosæ, Rosaceæ, Onagraceæ, Umbelliferae, Caprifoliaceæ, Rubiaceæ, Valerianaceæ, Dipsacæ, Compositæ, Labiatae, Boraginaceæ, Chenopodiaceæ, Polygonaceæ, Euphorbiaceæ, Urticaceæ, Ulmaceæ, Salicaceæ, Liliaceæ, Gramineæ, Equisetaceæ, and Fungi. One interesting specimen was a plant of *Faba vulgaris*, the common bean, showing the roots covered with the tubercles or nodules recently shown to consist of colonies of nitrogen-fixing bacteria. Most of the specimens came from Collinton Dell, to which there was to be an excursion on June 26. Others were from Craig Leith, and on the motion of the Chairman thanks were awarded to those who had provided the specimens and to Mr. Hill. There was a good attendance, and a very profitable evening was spent, the general feeling being that the new idea had worked well.

THE LATE MR. THOMAS FINLAYSON.—Mr. Thomas Finlayson, pharmaceutical chemist, late of North Fort Street, Ferry Road, Leith, who died on June 18, was a native of Kirriemuir (Thruma), and in early boyhood came to Leith, where his father was engaged in the Excise. After serving an apprenticeship with Mr. McDonald, of Catherine Street, Edinburgh, he went as an assistant to Dr. Murray, Kirkgate, Leith, and shortly afterwards purchased the business, which he carried on for a number of years till he removed to North Fort Street, where he continued in business till 1893, when he retired, owing to failing health, having suffered for several years from a bronchial affection. He became a member of the Pharmaceutical Society in 1852, and was appointed local secretary for Leith in 1871, an office which he continued to hold till 1893. He was a quiet man, of kindly disposition, and was much respected by all who knew him. He took a lively interest in the affairs of Bonnington United Presbyterian Church, of which he was an esteemed office-bearer.

Irish News.

PHARMACY ACT PROSECUTIONS.—At Roscommon Petty Sessions on Monday, the 17th instant, the magistrates being Mr. Browne, R.M. (Chairman), Mr. John Neilon and Mr. Thomas Shiell, a case came on of the Pharmaceutical Society of Ireland v. Jones. At a session of the Court three weeks previously Mr. James

Jones and another defendant appeared on summonses charging them with breaches of the Irish Pharmacy Act, 1875, and the Poisons Act, 1890, by having on March 1, in the present year, sold "Bigg's Sheep-Dipping Composition" and "Cooper's Sheep-Dipping Powder," both containing poison, without being properly qualified to do so. They were also charged with unlawfully keeping open shop for the sale of poisons. In consequence of the Pharmaceutical Society not being named as the complainants in those summonses three of them were dismissed and two adjourned.—Mr. J. M. Whelan, solicitor, now appeared on the part of the Society to prosecute in five fresh summonses, charging the same offences, but in which the defendants were Miss Jane Jones, Mr. James Jones, the defendant in the former summonses, and Mr. Antony Cowdy, these persons being, as was stated, the successors in business of Mr. John Jones, deceased since March, 1893, and Mr. Cowdy being his executor. The establishment in which the compounds were alleged to have been sold is a general hardware and grocery shop in Castle Street, Roscommon.—Mr. Burke, solicitor, appeared for Miss Jones and Mr. Jones, and objected to the cases going on, upon the ground that the summonses had been only served late on Friday evening at the Castle Street place of business, and that Mr. Cowdy did not reside there at all, and had had no notice of the proceedings.—Mr. Whelan maintained that the service was sufficient for all parties.—The magistrates decided to adjourn the hearing of the fresh summonses to that day fortnight, being the next court day, and to dismiss without costs the previous summonses against Mr. Jones.

A PHILANTHROPIC PHARMACIST.—At the Grand National Bazaar now taking place in the Queen's Hall, Langham Place, London, and which Her Royal Highness the Princess of Wales so graciously opened on Tuesday last, 25th inst., a Belfast pharmaceutical chemist and his wife have been rendering yeoman service. Mr. J. C. C. Payne, J.P., and Mrs. Payne, of Botanic Avenue, Belfast, labour continually for the admirable society in aid of which this bazaar is being held—the Society for the Prevention of Cruelty to Children, in connection with which there is a prosperous Belfast branch. Mr. Payne has an establishment in Belfast and another at Hollywood, a prosperous little watering-place some four miles distant on the County Down side of Belfast Lough. At the bazaar in the Queen's Hall the Belfast branch has "The Linen Stall," and amongst the names of a number of several noble ladies presiding over it will be found that of Mrs. Payne, while one of the two stewards is Mr. Payne, who with his wife went over to London to sojourn there during the bazaar. But space does not suffice to tell of all the service they have rendered to the above admirable Society, and, indeed, to kindred institutions.

NEW PHARMACY IN BELFAST.—On the Castle Lane side of the Imperial Hotel a new pharmacy has been opened, and to it there has been very appropriately given the title of "The Imperial Pharmaceutical Establishment." Formerly the Imperial Hotel occupied the building down to the ground. During the past few months the lower storey has been converted into shops, and one of them in busy Castle Lane—which leads from Donegall Place to Arthur Square, where the Theatre Royal sits—has been secured by Mr. Ritson, L.P.S.I., who has there opened a very neat concern. There is no other pharmacy in the immediate vicinity. Formerly Dr. Ball was for many years immediately opposite "The Imperial," in Donegall Place.

ANOTHER NEW PHARMACY.—The commercial capital of Ireland continues to make wondrous strides as regards population. In all directions Belfast continues to spread, and into it yearly the working classes continue to pour. Here they have the self-contained house which they cannot obtain fitted out in the same complete manner in either England or Scotland, and here, too, they secure employment for their daughters as well as their sons. One of the most rapidly extending districts is Duncairn Gardens, which lies out under the shadow almost of the celebrated Cave Hill, but which is also so high that from it there can be obtained views of Belfast Lough and of the coasts of Antrim and Down. Here Mr. S. T. Cleland, L.P.S.I., is opening a pharmacy. The site is a good one; the population is rapidly increasing in the district, and business should follow. Mr. Cleland's prospects seem most favourable.

Welsh News.

DEATH OF A COUNTY ANALYST.—The death is announced of Dr. William Morgan, of Swansea, which took place on Wednesday week, at his residence in Northampton Place. The deceased, who had been suffering for a long time from Bright's disease, was public analyst for Glamorganshire, Swansea, and most of the counties in South Wales. He was Chairman of the Swansea School Board, and principal of the Swansea Technical School. The funeral took place on Saturday last, and was largely attended by public men from all parts of South Wales. Dr. Morgan was only 49 years of age. Votes of condolence with the relatives of the deceased were passed by the Glamorgan County Council on Thursday, on the motion of Mr. T. J. Hughes, seconded by Sir John Llewelyn, and by the Council of the Swansea Training College. Mr. Charles Seyler, the deputy analyst, has been appointed by the Glamorgan County Council to discharge the duties of analyst until a successor to Dr. Morgan has been decided upon.

"ONE OF SATAN'S SLAVES."—A young man named Bertie Potter died in Swansea Hospital on Sunday from the effects of poison. On an envelope he had written, "Bert Potter; 12 o'clock exactly; 23 6 1895. One of Satan's slaves."

UNIVERSITY OF WALMS.—The Committee of the General Medical Council, London, have included the new Welsh University under Division I. in the list of examining bodies whose examinations in general education are recognised by the Medical Council as qualifying for registration as medical or dental students.

CARDIFF ABATED WATER CO., LTD.—The report of this Company shows a balance of £308 18s. 6d. on the wrong side, as the result of the year's trading. In the previous year there was a debit balance of £378 4s. 8d., making a total of £687 3s. 2d. The Company owes the Wilts and Dorset Bank £372.

MYSTERIOUS POISONING CASE.—Another mysterious poisoning case has occurred at Swansea, the cause of which has not been ascertained. A few days ago a family named Hill was taken suddenly ill after eating veal and cake, and the father died. A post-mortem examination took place, and the veal and baking powder with which the cake was made were subjected to analysis. Mr. Charles Crocker, Assistant to the Public Analyst, has certified that the veal and baking powder were free from vegetable or mineral poison, although the veal was partly decomposed. The mystery therefore remains unsolved.

GRATUITIES AND DONATIONS.—The South Wales Merchants' Protection Association, which includes a number of local chemists, has resolved that "no subscription or donation be given by members of the Association to pic-nics, summer outings, or for Christmas boxes after this date."

FOOD AND DRUGS ACT.—A novel defence was set up by the defendant in a milk adulteration prosecution at Merthyr last week. Shadrach Dando was summoned for selling milk adulterated with 16 per cent. of water on May 11. The point raised was that the hearing of the summons must take place within twenty-eight days of the commission of the offence, as milk was a perishable article. The Stipendiary held that the objection was good, and dismissed the case.

Poisoning Cases and Inquests.

Carbolic Acid.—George Unsworth was found dead on Tuesday, June 18, in Newsham Park, Tulsebrook, having died from the effects of carbolic acid, self-administered. Verdict: "Deceased died from drinking carbolic acid, but there was no evidence to show the state of his mind when he took it."

Carbolic Acid.—Annie Elizabeth Fletcher, aged 24, died on Friday, June 7, at Garden Terrace, Main Street, Keswick, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst temporarily insane."

Carbolic Acid.—Hester Francis, aged 16, died on Sunday, June 16, at Notting Dale, London, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Ammonia.—Ann Coates, aged 74, died on Tuesday, June 11, at Worthing, from the effects of ammonia, self-administered. Verdict: "Deceased by inadvertence drank some ammonia, and thereby accidentally came to her death."

Opium.—Thomas Ernest Percy Pugh, aged 9 days, died on Thursday, May 30, at 20, Bridge Street, Shrewsbury, from the effects of opium contained in "Godfrey's Cordial." Verdict: "Death from an overdose of poison, accidentally administered."

Spirit of Salt.—Louisa Alice Stone, aged 18, died on Sunday, June 16, at 31, Lombard Road, Battersea, from the effects of spirit of salt, self-administered. Verdict: "Suicide during temporary insanity," and the jury added a rider expressing an opinion that all poisons such as spirit of salt, carbolic acid, etc., not protected by the Act, should have more stringent measures put upon them to prevent their sale.

Carbolic Acid.—William Henry Brougham, aged 46, died on Monday, June 17, at 122, Embury Road, Hulme, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst insane."

Chloral Hydrate.—Caroline Sandford died on Wednesday, June 19, in the Royal Free Hospital, London, from the effects of chloral hydrate, administered to her by her husband, Alfred Sandford, in mistake for Epsom salts. Verdict: "Accidental death."

Prussic Acid.—Stephen Hughes, aged about 54, was found dead in a field at Sea Mills, on Tuesday, June 18, having died from the effects of prussic acid, self-administered. Verdict: "Deceased died from the effects of a dose of prussic acid, taken whilst of unsound mind."

Patent Office Business.

APPLICATIONS FOR PATENTS.

[From the *Illustrated Official Journal (Patents)*.]

No. 11,325.—Improvements in means or apparatus for inspecting the throat, eyes, or other organs, and for similar purposes. June 10.

No. 11,439.—Improvements in and connected with pestle and mortar machines. June 12.

No. 11,532.—Improvements in or relating to the heating or cooling of fluids and apparatus therefor. June 13.

No. 11,551.—Improvements in graduated glass measures. June 13.

No. 11,701.—An improvement in syringes. June 15.

No. 11,702.—A new or improved ointment, balm, or liniment. June 15.

PATENTS PUBLISHED JUNE 8.

Purifying sugar, etc. (Blvth, D.).—Sugar, glucose, sewage, etc., is filtered and decolourised by passage through a bed of magnetic iron oxide, a current of electricity being passed through the oxide as required, to "increase the quantity of ozone generated by the oxide," and oxygen gas may be forced through it at intervals, with the same object. No. 5518 of 1894.

Preserving meat, etc. (Lake, H. H., communicated from Delangle, F.).—The meat or other organic matter is suspended in a chamber through which a current of cold air is constantly circulated by means of a blowing apparatus. The inventor states that putrescible substances may be thus preserved for months. No. 6010 of 1894.

Ear-trumpet (Leigh, H.).—Comprises a small tube shaped like a post-horn and of such a size as to fit within the ear. An artificial drum resting against the drum of the ear, is formed of a disc of indiarubber tissue and a "sucker" consisting of an indiarubber annulus surrounding the artificial drum is applied, so that, in case the drum of the ear has sunk inwards, it shall be drawn back into its normal position. No. 9804 of 1894.

Bye-products from sodium-carbonate manufacture (Greenwood, J.).—The ammonium chloride obtained as a bye-product in the "ammonia-soda" process, is digested with zinc oxide instead of with lime, as is usual, to liberate the ammonia. The zinc chloride thus produced is electrolysed with production of zinc and chlorine, which may be utilised as required. The zinc oxide may be obtained by roasting zinc ore. Other metals, which are reducible electrolytically, may replace the zinc. No. 11,655 of 1894.

Making white lead and ammonia salts (Wilcox, H.).—A mixture of ammonia and carbonic acid gas in the proportion in which they exist in ammonium carbonate, is obtained by heating a solution of ammonium sulphate or other salt of ammonium, and chalk, and the mixed gases and steam are led through a solution of nitrate or other salt of lead. The lead is precipitated as basic carbonate, and nitrate or other salt of ammonium is produced. Sometimes the lead carbonate is precipitated from the basic acetate, the gases being first passed through dilute nitric acid to remove the ammonia, before passing to the acetate. No. 13,202 of 1894.

Ammonia from air (Mackey, W. Mc.D., and Hutcheson, J. F.).—A vertical furnace is charged with a mixture of carbonate, hydrate, oxide or nitrate of potassium, usually with a proportion of not more than 20 per cent. of similar compounds of barium, calcium or sodium, and the necessary amount of coal, coke, or other fuel. A blast of hot air is supplied through tuyères at the base of the furnace, and at a suitable height, steam is supplied to decompose the cyanides

produced below, into alkaline carbonate and ammonia, the latter of which is carried away to a suitable condenser. No. 13,315 of 1894.

PATENTS PUBLISHED JUNE 15.

Alkaline ferrocyanides (Crowther, H. W., Roessler, E. C., Hood, J. J., and Albright, G. S.).—The ferrocyanide of potassium or sodium is prepared by heating the fused sulpho-cyanate with iron turnings or borings in the proportion of 65 parts of iron to 97 parts of the potassium sulpho-cyanate or 81 parts of the sodium salt. If the iron contain any oxide, this is converted into sulphide by treatment with an alkaline sulphide or the like in solution. The sulpho-cyanate is first dried by heating in an atmosphere of inert gas, such as that from a lime-kiln, and the iron is added and the heat raised. The reaction is assisted by stirring the mixture. The mixture of iron sulphide and alkaline ferrocyanide obtained is lixiviated, and the latter salt is crystallised out. No. 8305 of 1894.

Electrolysis (Gautier, E.).—The electrodes used in the electrolysis of fused sodium chloride or other salts are kept cool by a stream of water suitably supplied. The temperature at which they are kept depends on the nature of the salt under treatment. No. 10,032 of 1894.

Hæmoglobin (Hommel, A.).—Purified hæmoglobin is obtained from blood as follows: The fresh blood is freed from fibrin, and the dissolved gases are removed by exposure to a vacuum in the cold. About 20 per cent. of water containing a "volatile antiseptic," such as creosote or alcohol, is then added, and the mixture is evaporated in vacuo at about 30° or 40° C. After the water has been thus distilled off, the temperature may be raised to 55° or 60° C., especially if creosote has been used. The urea and hippuric acid are removed by hydration and conversion into volatile compounds. The product is a deep red solution of hæmoglobin, and may be mixed with glycerin or other substance to overcome its insipid taste. No. 12,504 of 1894.

Pessary (Golby, F., communicated from Weisgerber, P.).—Comprises an indiarubber or other perforated bag containing a suitable antiseptic capable of destroying bacteria, and of generally disinfecting the vagina. The antiseptic is gradually dissolved by the secretions. No. 13,324 of 1894.

Sulphocyanates (Albright, G. S., and Hood, J. J.).—Alkaline sulphocyanates are prepared: (1) by digesting together ammonia, carbon bi-sulphide, and magnesia, whereby sulphocyanate of ammonia and sulphhydrate of magnesia are produced; (2) by employing the same substances together with a fixed alkali or alkaline earth, whereby sulphocyanate of the alkaline or alkaline earth, metal, and sulphhydrate of magnesia are produced. In either case the magnesia salt is decomposed into sulphuretted hydrogen and insoluble magnesium hydrate by boiling the solution, and the sulphocyanate is obtained by decantation and evaporation. No. 14,154 of 1894.

Abdominal belts, suspenders, etc. (Coe, L. E., and Smith, H.).—Abdominal belts made in several pieces stitched together and shaped to the figure, are provided with eyelet holes round the lower edge, from which depend straps for supporting stockings and other garments. No. 4942 of 1895.

Case for surgical instruments (Schreus, T.).—Comprises a metal case so arranged that the instruments, etc., in it may be sterilised by means of steam without necessitating their removal. No. 7262 of 1895.

Thermometers (Brückner, J.).—Clinical and other thermometers are made with the ordinary indicating mercury column, but with the usual bulb containing the bulk of the mercury, replaced by a single or double spiral column, whereby a larger surface is exposed. No. 8117 of 1895.

New Remedies.

[The notes given under this heading, for the information of dispensers, embody recent suggestions in therapeutics, and cover both new drugs and preparations, and old ones under new aspects. The word "parts" is used to represent parts by weight, both for solids and liquids.]

QUININE DICHLORHYDRATE SUBCUTANEOUSLY IN WHOOPING COUGH.—Laubinger employs this salt in solution in water, in three strengths, viz., 10 parts in 10 parts of water; 6 parts in 14 parts, and 5 parts in 15 parts. One gramme of these solutions contain 50, 30, and 25 centigrammes respectively of the alkaloidal salt. The injection is made into the back, the syringe being slowly withdrawn, and is accompanied by slight kneading of the parts surrounding the point of injection to assist re-absorption. As a rule, two injections daily are sufficient, and generally the weaker solution will be found sufficient (*Rev. de Thérap. Méd. Chirur.*, after *Jahr. fur kind nolk.*, lxi., 319).

TRIONAL AS AN HYPNOTIC.—Dr. Gaillard reports that only five out of forty cases of insomnia which he treated with one-gramme doses of trional proved refractory to the remedy. The action was purely hypnotic, and no interference with the physiological action of other medicines given at the same time was noticed. Both sleep and waking after the dose were normal. The treatment was employed in simple insomnia, in neurasthenia, morphinomania, and in febrile, cardiac, and tuberculous affections. It is administered in cachets and acts very promptly, sleep being produced in twenty minutes (*Bull. Gen. de Thérap.*, cxxvii., 426).

INJECTIONS OF SALICYLIC ACID IN INOPERABLE UTERINE CANCER.—Kafus has repeated the treatment recommended by Bernard of injecting salicylic acid in cases of uterine cancer. He finds that this method of treatment diminishes and even stops hæmorrhage, removes offensive odour and irritant discharges, lessens pain, and ameliorates the general state of the patient. The treatment is, in fact, superior to all other palliative methods when the disease is too far advanced to permit of surgical extirpation. A 6 per cent. alcoholic solution of salicylic acid is employed, 1 to 4 cubic centimetres of the liquid being injected into the neck of the uterus by means of a Pravaz syringe inserted to the depth of two-thirds of a centimetre in three or four different places. The ordinary antiseptic precautions are taken both before and after the injection, and the patient is kept in bed for twenty-four hours after the operation. The injection is repeated every three or four days (*Rev. de Thérap. Méd. Chirur.*, lxi., 318, after *Méd. Oboc.*, 1, 1895).

MICROCIDINE IN OZÆNA.—Cozzolino employs the following ointment:—microcidine, 1 part; cocaine hydrochlorate, 15 parts; vasellin, 3000 parts; mix. To be snuffed up the nostrils three or four times daily (*Rev. de Thérap. Méd. Chirur.*, lxi., 323).

TAR FOR HÆMORRHOIDS.—The following mixture applied night and morning to the nodules will effect a cure in from four to twelve days. Wood tar, 3 parts; extract of belladonna, 3 parts; glycerin, 30 parts (*Rev. de Thérap. Méd. Chirur.*, lxi., 328).

PILOCARPINE IN ALLAYING DIABETIC THIRST.—Five or six drops of the following solution of pilocarpine nitrate are dropped four or five times daily upon the tongue. Nitrate of pilocarpine, 5 parts; alcohol, 30 per cent. by volume, 300 parts; distilled water, 800 parts (*Rev. de Thérap. Méd. Chirur.*, lxi., 323).

Notes and Queries.

[The information given in this column includes both notes of practical interest to pharmacists, and replies to queries which seem to possess sufficient interest to readers generally.]

PEACH KERNEL OIL.

[895.] Peach Kernel oil usually named on the Continent "Ol. amygdalarum dulcium gallicum," and used as a substitute for almond oil, possesses a peculiar odour, which is specially noticeable when the oil is warmed. As previously mentioned in the Journal, this smell is due to the presence in the oil of a small quantity of benzaldehyde, which can easily be extracted by shaking the oil with sodium bisulphite, and then decomposing the resulting compound by means of alkali. The benzaldehyde is no doubt formed by the decomposition of a small quantity of the amygdalin while the kernels are being pressed. (*Journ. d. Pharm. v. Els-Loth.*, 1895, 153). The quantity of benzaldehyde obtained, is, however, so small as to be practically useless, except in so far as it goes to demonstrate the origin of the peculiar odour referred to.

REMOVAL OF STOPPERS BY ELECTRICITY.

[896.] To avoid the inconveniences attending the application of heat from a flame in removing glass stoppers that have become fixed, R. W. Hill (*Chem. News*) uses a circular adjustable clamp, to which is attached a strip of asbestos, in which coils of platinum wire are embedded. The clamp is pressed round the bottle-neck, a current of electricity allowed to pass, and sufficient heat is generated to expand the glass and so loosen the stopper.

PREPARATION OF MERCURIAL OINTMENT.

[897.] This ointment is prepared by W. Leareux (*Pharm. Post*), and said to form a very intimate mixture, by placing three kilos. of mercury in a suitable vessel, adding to it a solution of 50 Gm. of ferric chloride in 250 Gm. of water, and agitating the vessel until a paste is formed (about a quarter of an hour). The iron is then removed by washing with water some ten to fifteen times, by the aid of a siphon. The mercury remains in a pasty condition and is next mixed with a small quantity of lard, and left for twenty-four hours, after which the rest of the excipient is added.

RAPID PREPARATION OF FOWLER'S SOLUTION.

[898.] A direct method of preparing this solution is described by T. Garraud (*Bull. de Pharm. de Bord.*), who replaces the potassium carbonate by caustic potash. He dissolves 10 Gm. of arsenious anhydride in 145 C.c. of normal potash solution (or a solution containing 8.10 Gm. anhydrous caustic potash), filters, and adds 813 Gm. of distilled water, and 30 Gm. of tincture of mélisse (*Melissa officinalis*, L.). The proportions are, of course, based upon the formula of the French Codex, but the process may be worth adapting to the English preparation because of the rapidity with which a solution of constant alkalinity may be prepared in the cold.

MILK OF MAGNESIA.

[899.] Harding prepares this as follows:—Six ounces of caustic potash are dissolved in 4 pints of water, and strained through cotton. Ten to 12 ounces of magnesium sulphate is also dissolved in 4 pints of water, filtered, and mixed with constant stirring. Finally the precipitate is washed well, tested, and then suspended in the smallest quantity of water. The volume of the finished "milk" should be about 2½ pints. According to the author, it is important that the solutions should be hot when mixed, and should be washed with hot water, the precipitate being much finer than when cold solutions and washings are employed (*West. Drug.*, xvii., 183).

Notices, Letters, and Answers to Correspondents.

COMMUNICATIONS FOR THE CURRENT WEEK'S JOURNAL SHOULD REACH THE OFFICE, 17, BLOOMSBURY SQUARE, LONDON, W.C. ADDRESSED "EDITOR," NOT LATER THAN THE FIRST POST ON WEDNESDAY. TELEGRAMS CAN BE RECEIVED ON THURSDAY MORNING. Telegraphic Address:—"PHARMACEUTICAL JOURNAL, LONDON."

ADVERTISEMENTS (except for the "EXCHANGE" column), orders for copies of the JOURNAL, and instructions from Subscribers respecting transmission of same, should not be addressed to the EDITOR, or delay will be caused. See directions on Editorial page.

CORRESPONDENTS who wish notice to be taken of their communications must write in ink on one side of the paper only, and should authenticate the matter sent with their names—of course not necessarily for publication. No notice can be taken of anonymous communications.

NAMES and FORMULÆ should be written with extra care, all systematic names of plants and animals being underlined, and capital letters used to commence generic but not specific names.

* * Queries should be addressed "Editor," and will be replied to as early as possible after receipt, answers of sufficient general interest being given under the heading NOTES AND QUERIES.

LETTERS.

EXTREME CUTTING.

MR. A. W. BALL, of Oppenheimer, Son, and Co., Ltd., writes on this subject as follows:—"We have observed the correspondence in your esteemed Journal with reference to the matter of 'Extreme Cutting,' and quite appreciate the extent of the difficulty in this direction, and know that unless something is done to secure a reasonable profit to the chemist and retailer it will not be worth his while to push the sales of proprietary articles. Some time ago, we formulated a memorandum of agreement with the wholesale drug trade in order to secure for them a profit upon sales to the retailers, and recently we have arranged an agreement which has already been signed by a very large number of the leading stores and cutting chemists, arranging that they shall not retail our pharmaceutical products and appliances at lower rates than those published in our current price-list. By doing this we hope to receive the mutual support of the retail trade in a matter which is advantageous to all concerned."

THE METRIC SYSTEM.

"GILSEN" objects to the adoption of this system in the following vigorous terms, but he leaves out of sight the fact that professional chemists and others who have employed metric weights and measures daily for years past are in full accord as to their advantages, and are generally unaware of any corresponding disadvantages:—"It is time that some of the good old feeling which is in existence should have a voice. The feeling has been nurtured on the arguments of men like Sir John Herschell and Piazzi Smyth on the usage of centuries, and on the belief that what is English is good for an Englishman. It is quite possible that some theoretically perfect Parliament may be set up some day somewhere, but it would be a great mistake for the 'mother of parliaments,' with her precedents slowly broadening down, to adopt it. There is an English genius and there is a French genius, and leaving all sentiment out of the question, the French metric system is based on an error, is a misconception from the beginning, and its only merit is a certain simplicity which implies that tens are easily added or multiplied. In these days of advancing mind, of forward movement in every direction, but especially of educational training, is it possible that the heirs of all the ages find our arithmetic too difficult? I know that many will bitterly regret my pandering with or truckling to error however specious, with monstrosity however fashionable, or with false science in any guise. The chemist is suffering from a new departure; the old man of the woods, with the features of the country parson predominant, is on his back in the shape of the stores; but disestablishment is thundering at his gates, and will also overwhelm us if we weakly navigate our

pharmaceutical vessel for the purpose of catching French whales which have been already landed and found to be sprats. What a legitimate lever the old Latin pharmacopoeia would be now to close the door on the interloper and the smatterer. Is another old landmark to go, another disintegration to creep in and be the little rift within the lute? Let us hope not."

PRISON DISPENSERS.

"ASSOCIATE" thinks "it may be interesting, though it certainly will not be very flattering to dispensers, to know the manifold duties of compounders at H.M. prisons, according to information obtained at a local prison. They are briefly:—To dispense medicines; to assist in keeping medical records; to keep instruments in good order and to assist at operations when required; to sleep in the hospital on alternate nights, and to take temporary charge of the hospital at other times during temporary absence of hospital warder; to conform to directions he may receive from time to time from the Commissioners, Governor, or Medical Officer; to be responsible for good order of dispensary and safe custody of drugs. Item three is disagreeable and item four is humiliating, and it is surprising that such duties still live on. In addition to these, a compounder must submit his physical fitness to unpleasant methods of criticism, and he is required to wear uniform. Cannot our Council suggest to the authorities the folly of such requirements? Perhaps this is the proper time."

SECTION CUTTING.

"ELBOW-JOINT" finds a difficulty in following some instructions given in the Journal. He says: "The excellent article on the study of *Materia Medica* recently published in the *Pharmaceutical Journal*, aroused in me, as it must have done in many other students, much interest. Wishing to cut sections of a conium frust. I obtained some elder pith in which I firmly fixed a frust. Placing, in the innocence of my heart, my elbows 'firmly against the sides of the body,' I made desperate efforts to cut some sections, but, as I possess no joint in my arm between the elbow and the wrist, the principal result of my contortions was an attack of cramp. Surely, sir, the left arm should be steadied against the side, whilst the right hand, carrying the razor, should move freely." "Elbow-Joint" has accurately solved the problem unconsciously set by the writer of the article in question, and may, with an easy mind and much profit, go on cutting sections in the way he now suggests."

PHOTOGRAPHY FOR CHEMISTS.

MR. W. PILKINGTON, M.P.S., of Buxton, writes as follows:—"I am pleased to note that you are lending a helping hand to your photographic subscribers, who form a considerable body, and will, no doubt appreciate your efforts as I do. . . . I find it good policy to keep a dark-room for free use of customers, and to cater well for their wants, even though it means a large outlay and much space."

ANSWERS.

H.W.S.—You can obtain a first-class "platyscopic" or "aplanatic" lens, mounted for the pocket, for fifteen shillings. C. Baker, 243, High Holborn, W.C., makes them at this price, of three different powers, magnifying five, ten, and twenty diameters respectively. The lowest power is best for general botanical purposes.

G. A. THOMPSON.—The plant sent is a cultivated exotic honeysuckle, possibly a *Leycesteria* (Caprifoliaceae). May be able to give you further information later.

"J. D. J."—You are not likely to find any London manufacturers of the substances you mention. They are practically entirely produced in Lancashire, by the United Alkali Co., of Runcorn, Liverpool, and others.

G. HAEVIE.—The information required will be given in next week's Journal. We cannot undertake to reply to queries by post.

COMMUNICATIONS, LETTERS, ETC., have been received from Messrs. Bethune, Butler, Coull, Cracknell, Greaves, Hallaway, Hardwick, Idris, Millard, Naylor, Parry-Owen, Reid, Rogers, Smart, Thompson.

Notes.

A special meeting of the trade is to be held in the Memorial Hall, Albert Square, Manchester, under the auspices of the Manchester Pharmaceutical Association, on Wednesday afternoon, January 23, when the President of the Pharmaceutical Society is expected to deliver an address. Mr. and Mrs. Carteighe will afterwards be present, by invitation, at the Manchester Pharmacy Ball, particulars of which were published last week (see p. 550).

The Indian Medical Congress was opened at Calcutta on December 24, by the Viceroy, who spoke at some length regarding the progress of medical science in India. The inaugural address was afterwards delivered by Surgeon-Colonel Harvey, Inspector General of Hospitals in Bengal. The Congress was closed on December 29.

A new method of soldering aluminium is said by *Invention* to have been suggested by Herr Naaman H. Keyser, who states that he has soldered aluminium, without the use of any flux at all, by heating the metal and scraping the surface so as to remove the oxidising film until the metal is "tinned," when union takes place easily enough. The alloy used consists of tin 50 parts, silver 25, aluminium 25, and melts at 750°, but almost any tin solder will, it is stated, serve equally well.

The name "argon" has been given to the new element stated to exist in the atmosphere, and, at a special meeting of the Royal Society on January 31, Lord Rayleigh and Professor Ramsey are to present their paper on the supposed new constituent, and the matter will then be discussed.

According to the *Lancet*, Lord Rosebery has consented to receive a deputation during January, which will advocate the formation of a University of London on the lines recommended by the recent Royal Commission.

The American journal, *Science*, which was recently compelled to suspend publication on account of want of support, is to be recommenced with the new year under the control of a thoroughly representative editorial committee. Chemistry will be represented by Professor Remsen; Botany by Professor N. L. Britton; and Hygiene by Dr. J. S. Billings.

In the course of a lecture on science teaching recently delivered by Mr. H. G. Wells at the College of Proceptors, and published in the *Educational Times*, the lecturer pointed out that a rational course of science should grow naturally out of kindergarten, followed by object lessons proper. The broad basis of physics and chemistry, led up to in this way, was described as the only permanently valuable preparation for a scientific calling that can be given in a secondary school.

The members of the Chemists' Assistants' Association inaugurate their proceedings for the coming Half-Session with a Smoking Concert, to be held on Wednesday next, 9th inst., at the Horse Shoe Hotel. Mr. T. Tyrer, F.C.S., F.I.C., is to take the chair at 8 p.m. Tickets (1s. each) are obtainable from the Secretaries, 103, St. Russell St., W.C.

The trustees of the New York Pharmaceutical Club held their first dinner at their handsome club-rooms, 37, East Ninety-seventh Street, on Wednesday, November 21. The President, Mr. Bell, briefly set forth the objects of the club and its aims, and stated that the membership was increasing so rapidly, and that they were receiving such substantial encouragement from their friends, that before many months they hoped to be in their own club-house. The officers of the club are Robert J. Bell, President; John W. Bachelder, Vice-President; Frank A. Barnes, Treasurer; Velie A. Wood, Secretary.

A social meeting of the Midland Pharmaceutical Association was held at Birmingham, on Thursday, December 13. There was a goodly muster of members present, and an enjoyable evening was spent. The "Chat on Trade Topics" was deferred to a future meeting.

The resignation of Sir Henry Acland as Regius Professor of Physic at Oxford took effect with the close of the year, after he had held the chair for thirty-six years. It has been resolved to commemorate his services to the University and the city by some permanent memorial. This will take the form of a special fund of £10,000, to be used as a permanent endowment of the Sarah Acland Home for Nurses, founded in memory of Sir Henry's wife.

Mr. W. Spencer Turner was the recipient of a very handsome marble timepiece and an address, presented to him by the students of the Manchester College of Pharmacy, "in token of the high respect and esteem in which he is held by them," on his retiring from the directorate. The College will in future be conducted by Mr. Charles Turner.

The *Scientific American* reports that a New York citizen has placed 30,000 dollars at the disposal of the Health Department of the city for the purpose of providing an adequate supply of anti-toxin serum. Several spurious concoctions have recently been placed upon the American market as anti-toxin serum, and steps are being taken by the Board of Health to supervise the sale of the preparation.

In the Urban District Council election at Llanelly, Carmarthenshire, Mr. Evan Jones, chemist and druggist, was one of the successful candidates for No. 3 Ward.

Mr. Henry Morgan Davies, chemist and druggist, has been elected an Urban District Councillor, in the Liberal interest, for the Western Ward of Blaenavon, Monmouthshire.

Mr. E. B. Ford, pharmaceutical chemist, Pontypool, was at the head of the poll both in the local Urban District Council election and at the election of guardians for Pontypool.

Mr. Vincent A. Wills, chemist and druggist, has been elected a guardian of the poor for the district of Cyfarthfa, in the Merthyr Tydvil Union.

Among the successful candidates at the Parish Council election at Laugharne is Mr. John Johns, chemist and druggist.

Mr. John Evans, J.P., chemist and druggist, headed the poll in the Urban District Council election at New Quay, Cardiganshire.

Mr. A. E. Evans, chemist and druggist, has been elected an Urban District Councillor for the South Ward of Brynmawr.

Mr. E. J. Allen, who was a pupil of Prof. Schultze, of Berlin, has just been appointed director of the marine biological laboratory at Plymouth, in succession to Mr. E. J. Blew.

Messrs. Mackey, Mackey and Co. announce their removal from Bouverie Street to 175, Grange Road, Bermondsey.

"Natural Mineral Waters—their Properties and Uses," a pamphlet published by Messrs. Ingram and Royle, Farringdon Street, E.C., has now reached its tenth edition, having been revised and enlarged. The analyses of the various mineral waters which are recorded in the pamphlet should prove of use for reference purposes by pharmacists and medical men, as should also the index and appendix in which the names of the springs are arranged in alphabetical order, and the properties and uses of the waters given in parallel columns.

As evidence of the recent excessive mildness of the season it is reported that a swarm of bees occurred on a Lincolnshire farm during the latter part of December.

A correspondent of *Nature* suggests the word "solute" to express the dissolved substance in a solution.

Legal and other News.

HORSE POISONING AT SPALDING.—At the Petty Sessions on Tuesday, December 18, Tom Harry Rhodes, farm servant, was charged with administering vitriol and saffron to five mares belonging to Mr. Thomas Atkinson, farmer, of Postland, and was further charged with stealing about a sack of corn from Mr. Atkinson, both offences being during this month. The evidence showed that defendant had got a large quantity of poisonous drugs—vitriol, antimony, green saffron, etc.—and had been systematically giving them to five valuable mares belonging to Mr. Atkinson. He was also found to possess a bunch of skeleton keys which would unlock most of the doors on his master's premises. During last year Mr. Atkinson had had three very valuable horses poisoned by arsenic, administered by his horseman.—The chairman very severely censured defendant, and sentenced him to a month's imprisonment with hard labour for each offence.—*Nottingham Guardian*.

FIRE AT MESSRS. POTTER AND CLARKE'S.—A fire broke out early on December 20 at Raven Row, Spitalfields, E., upon the premises of Messrs. Potter and Clarke, botanical druggists. The property first attacked comprised a range of buildings of two floors, used as a laboratory and stores, the flames originating on the ground floor. The firemen from the Commercial Road East Station were called up. The doors were burst open, and the firemen set a powerful hydrant and two steamers to work, with such excellent effect that an admirable "stop" was effected. The flames had actually penetrated to the roof, but although the entire building was very seriously damaged, it was saved from total destruction.—*Echo*.

ALLEGED ATTEMPTED SUICIDE AT A HOSPITAL.—On Saturday, December 22, Mary Jane Price, aged 20, a native of Glamorganshire, was admitted to the Queen's Hospital, Birmingham, suffering from the effects of a quantity of digitalis. Whilst serving as a domestic servant a few months ago, she was seized with smallpox and removed to the Infectious Hospital at Northfield, and on recovering she remained as a servant. On the Saturday morning Miss Flewitt, the matron, had occasion to reprimand her about the way she was performing her duties. Shortly afterwards Price took a bottle containing digitalis out of a cupboard in the surgery and swallowed the contents. She was removed to the Queen's Hospital, and after the usual remedies had been resorted to she was detained.—*Birmingham Post*.

New Drug Companies Registered.

CEARNS AND BROWN, LIMITED.—Registered by Robins, Cameron and Co., Gresham House, E.C., for Bateson, Warr and Bateson, Liverpool, with a capital of £50,000 in £10 shares. Object: To carry on the business of ship's store dealers, general provision dealers, shipping and export agents, and dealers in all kinds of stores, preparations, articles and things, including paints, oils, chandlery, sails, wines, spirits, beer, pharmaceutical and medicinal preparations, and articles suitable, or likely to become suitable, for the purposes of shipping or export or for use on board ship, or in connection with the transit of goods and passengers by land or sea.

ATHERTON DRUG COMPANY, LIMITED.—Registered December 14. Capital £2000, in £1 shares. Objects: To acquire, take over as a going concern, and carry on the business of chemist, druggist and drysalter, the vending of patent medicines and sundries, and the dispensing of drugs now carried on by Henry Atherton, at 9, Market Street, Wigan, as "The Wigan Drug Stores."

Marriage.

Richardson—Auchincloss. On June 20, 1894, at St. George's R.C. Church, Carlton, Victoria, by the Revd. J. H. O'Connell, William N. Saunders Richardson (late of King's Lynn, Eastbourne, and Clifton), son of the late John Kelly Richardson, of St. Johns, Antigua, W.I., to Ruby, fourth daughter of Walter Wallace Auchincloss, of Hobart, Tasmania.

Press Comments.

The chief moral deducible from the case of suicide in Nightingale Valley, Portishead (see *Pharm. Journ.* p. 579), is that the traffic in narcotics and other noxious drugs ought to be more stringently regulated. In the pockets of the deceased, a young man, four or five laudanum bottles were found, the inference being that he had consumed a considerable quantity of the drug. It is a well-known fact that many persons in particular localities are addicted to the pernicious habit to which De Quincey was a slave. In fact, in the course of an inquest not long ago it was testified that a child had been from its earliest years dosed with laudanum. All this is very unsatisfactory, and there is a general impression that the restrictions should be so tightened as to make it extremely difficult for unqualified persons to obtain laudanum in sufficient quantity to destroy life. There are, no doubt, some difficulties in the way of reform, but they surely should not be insurmountable.—*Western Press*.

THE WORD "SCIENTIST."—In the December number of *Science Gossip* a protest was entered against the use of the word "scientist," which was invented and explained by Whewell in his "Philosophy of the Inductive Sciences," 1840, and the *Times* now quotes opinions on the point received from some well-known men. The Duke of Argyll, Sir John Lubbock, Lord Rayleigh, Professor Huxley, and Dr. Albert Günther unreservedly condemn the word. Sir John Lubbock suggests instead "philosopher," Lord Rayleigh approves Lord Kelvin's proposal to revert to the wider meaning of "naturalist," while Dr. Günther sarcastically suggests that "scientist" might advantageously be reserved to denote the modern dabblers in great scientific questions. Mr. Grant Allen, while condemning the word, argues that, as languages grow irresponsibly, it is pedantry to object to a new word when it is used by a majority of persons. After the camels of "sociology" and "altruism," "scientist" is a comparative gnaw. Professor Huxley thinks "scientist" must be "about as pleasing as 'electrocution'" to any one who respects the English language. Professor A. R. Wallace alone views the word with composure; he even describes it as "useful," and argues that, since we have "biologist," "zoologist," "geologist," "botanist," "chemist," "physicist," "physiologist," and "specialist," we might as well use "scientist." He asks what there is to use instead, and expresses the opinion that it is too late to object to the word now.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

SWEET-SCENTED FLOWERS AND FRAGRANT LEAVES. By D. M'DONALD. (Sampson Low and Co., London.)

A MANUAL OF OUR MOTHER TONGUE. By H. M. HEWITT and G. BEACHE. (W. H. Allen and Co., London.)

A NEW ENGLISH DICTIONARY ON HISTORICAL PRINCIPLES. Edited by Dr. JAMES A. H. MURRAY. Section Decadit-Deject (volume III.), 2s. 6d. (Clarendon Press, Oxford, and Henry Frowde, London.)

PHYSIOLOGY FOR BEGINNERS. By Professor M. FOSTER, M.A., M.D., F.R.S., and LEWIS E. SHORE, M.A., M.D. (Macmillan and Co., London.)

PRACTICAL METHODS IN MICROSCOPY. By C. H. CLARK, A.M. (Heath and Co., Boston.)

OUTLINES OF BIOLOGY. By P. CHALMERS MITCHELL, M.A., F.Z.S. (Methuen and Co., London.)

THE PLANET EARTH. An Astronomical Introduction to Geography. By RICHARD A. GREGORY, F.R.A.S. (Macmillan and Co., London.)

HALF-HOURS WITH THE MICROSCOPE. By E. LANKESTER. Nineteenth Edition. Illustrated. 2s. 6d. (W. H. Allen & Co., London.)

HELPS IN SICKNESS AND TO HEALTH. By HENRY C. BURDETT. (The Scientific Press, London.)

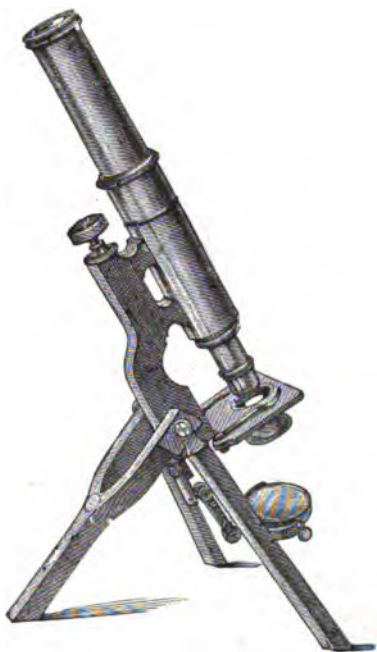
LESSONS IN ELEMENTARY SCIENCE. By H. MAJOR. (Blackie and Son, London.)

Novelties.

[Under this heading it is proposed to publish, from time to time, descriptions of new appliances and apparatus, and other novelties of interest to pharmacists. In submitting such articles for notice, full particulars should be sent, accompanied, if possible, by a block of suitable size for the Journal columns.]

DIAGNOSTIC MICROSCOPE.

This instrument has been made by Mr. Charles Baker, of High Holborn, W.C., at the suggestion of Surgeon-Major R. Ross, of the Army Medical Department, for diagnosing cases of malaria fever, etc. It has a sliding tube coarse adjustment, and micrometer screw fine adjustment, square stage of sufficient size to allow any portion of a seven-eighth inch cover-glass mounted on a 8 by 1 inch slip to be examined. It is fitted with a substage



condenser, one-twelfth oil immersion objective, and eyepiece, the combination giving a magnification of 700 diameters. The body can be used at a length of 160 Mm. but closes to 100 Mm. to facilitate packing. The instrument is fitted in a solid leather case, six inches by three inches by three inches, with shoulder-strap and loops to fit to military belt. A few glass slips and cover-glasses, also a bottle of cedar oil and a bleeding-needle are packed in the case.

CHRISTIA BACKED LINT.

By a new application of the now well-known "Christia," Messrs. Thomas Christy & Co., of Lime Street, E.C., have been able to prepare an improved material, unaffected by oil, grease, spirit, chloroform, and hot or cold water. It is highly recommended for the application of linimentum chloroformi, chloroformum belladonnae, and all other remedies which would soil clothing or destroy ordinary waterproof substances. By preventing the too rapid evaporation of the application, the backing tends to keep the lint moist.

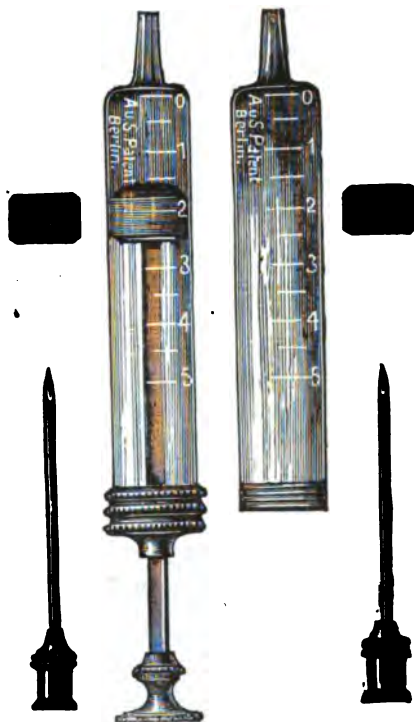
LIQUID SULPHURETTED HYDROGEN.



Liquid sulphuretted hydrogen compressed into specially prepared steel cylinders as shown, each containing one pound of liquid, equal to about 11 cubic feet of gas at atmospheric pressure, is now supplied by Messrs. Baird & Tatlock, Cross Street, Hatton Garden, E.C. The cylinders have been tested to 1,500 lbs. per square inch, and the pressure when filled with liquid H_2S never exceeding 300 lbs. per square inch. The valve has been specially designed in view of its use in chemical laboratories, and will be found to be absolutely tight. The gas is pure and dry. Compressed H_2S is said to be much more economical in use than the present method of generating it from sulphide of iron. It is decidedly more cleanly, and always ready for use. It can also be supplied in larger cylinders up to 28 lbs., and it is proposed to supply other gases for laboratory use in the same form.

SYRINGES FOR ANTITOXIN INJECTIONS.

Hypodermic syringes, as illustrated, are now offered by Messrs. Baird & Tatlock for injecting antitoxin in accordance with the system of serum-therapy. They are made in four sizes, containing one, two, five, and ten cubic



centimetres respectively, the largest size being more especially employed for antitoxin injections. They are sent out in plush-lined cases, and, as they are fitted with asbestos washers, and all parts unscrew, they are easily sterilised.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, JANUARY 7.

London Institution, at 5 p.m.

"The Netherlands, a Geographical Study" (Illustrated) by H. J. Mackinder.

Society of Chemical Industry (London Section), at 8 p.m.

"An Investigation of the Natural Solidified Sodium Sulphate Lakes of Wyoming, U.S.A.," by Dr. D. Harvey Attfield.

TUESDAY, JANUARY 8.

Pharmaceutical Society of Great Britain.

Benevolent Fund, Finance, and General Purposes Committees.

Preliminary Examination.

Royal Institution of Great Britain, at 8 p.m.

"The Electric Current working as a Power," by Professor J. A. Fleming.

Aberdeen Chemists' and Druggists' Assistants' and Apprentices' Association, at 9.30 p.m.

Debate, opened by Messrs. Forbes and Royal.

WEDNESDAY, JANUARY 9.

Pharmaceutical Society of Great Britain.

Council Meeting.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.

Opening Meeting, conducted by D. M'Ewan.

Sheffield Pharmaceutical Society, at 8.30 p.m.

"The Microscope in Pharmacy," by J. Austen.

Imperial Institute, at 8.30 p.m.

Smoking Concert.

Royal Colonial Institute.

"Whales and British and Colonial Fisheries," by Sir W. H. Flower.

Society of Arts, at 7 p.m.

"Waves and Ripples," by Professor C. V. Boys.

Chemists' Assistants' Association, at 8 p.m.

Smoking Concert at the Horse Shoe Hotel.

Plymouth and District Chemists' Association.

Special Meeting at the Foresters' Hall, at 2.30 p.m., to pass the revised rules.

Quarterly General Meeting, at 8 p.m. "Some Suggestions for a better Consolidation of those engaged in Pharmacy," by P. A. Kelly.

THURSDAY, JANUARY 10.

School of Pharmacy Students' Association, at 7 p.m.

"Vinegar," by W. H. Maunther.

"Electricity in relation to Chemistry," by F. F. A. Tunbridge.

Glasgow Pharmaceutical Association, at 9.15 p.m.

"Laboratory Notes and Suggestions for the Revised Pharmacopoeia," by T. Dunlop.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

Annual Dinner.

London Institution, at 6 p.m.

"Waves of Water and Waves of Light," by A. P. Laurie.

Imperial Institute, at 4.30 p.m.

"Gems, and how to distinguish them," by H. A. Miers.

FRIDAY, JANUARY 11.

Sheffield Microscopical Society, at 8 p.m.

Practical Evening at the Medical School.

Patent Office Business.

APPLICATIONS FOR PATENTS.*

Where complete Specification accompanies Application, an asterisk is suffixed.

No. 22,849.—Henry Gregory and Frank Smith, 4, Corporation Street, Manchester.—Improvements in, and connected with, stockings, knee-caps, and the like. November 26, 1894.

No. 22,850.—James Francis Braidwood, Thames Street, Greenwich, London.—An adjustable catch and cross-bar attachment for retort mouthpieces and other purposes. November 26, 1894.

* From the Illustrated Official Journal (Patents).

No. 22,853.—James Workman Walker, 87, St. Vincent Street, Glasgow.—Improvements in obtaining a continuous supply of hydrochloric acid or nitric acid gas, and in utilising acid sulphates. November 26, 1894.

No. 22,854.—William George MacIvy and the Princess Company, Ltd., 1, John Street North, Marylebone Road, London.—Improvements in tea and coffee making, and apparatus therefor. November 26, 1894.

No. 22,856.—Hermann Clark Haycraft, 48, Breakspere Road, Brockley, London.—Instruments for measuring the frequency of alternating or periodically varying electrical currents. November 26, 1894.

No. 22,862.—William Garraway, 115, St. Vincent Street, Glasgow.—Improvements in the manufacture of chromates and of nitric acid. November 26, 1894.

No. 22,864.—Richard Badger, Worston, near Clitheroe, Lancs.—Improved sieve for cleansing milk and other liquids. November 26, 1894.

No. 22,865.—William Oliver Rogers, 9, Serjeant's Inn, Fleet Street, London.—An improved ventilated lamp reflector. November 26, 1894.

No. 22,876.—Joseph George Hewson, 276, Hyde Road, Manchester.—Inhaler. November 26, 1894.

No. 22,880.—Radley Mott Trille, Egyptian Lodge, Val Plaisant, Jersey.—Electric arc lamp. November 26, 1894.

No. 22,883.—Gustav Binswanger and Edward Stanley, 73, St. Stephen's Road, Upton Park, London.—Improvements in electrical measuring instruments. November 26, 1894.

No. 22,900.—Robert Thomas Alexander O'Callaghan, 28, Southampton Buildings, Chancery Lane, London.—Improvements in cauterising apparatus. November 26, 1894.

Unclassified Advertisement.

WANTED for Ca'cotta.—An ASSISTANT with first-class experience. Age between 23 and 28. Single. Must have passed the Minor examination. Passage paid. Address, with full particulars of experience, &c., to C. H. E. M., Messrs. Deacon's, 154, Leadenhall St., E.C.

Notices.

* * Advertisements must be sent to Street Bros., 5, Serle Street, Lincoln's Inn, W.C., where copies of the Journal may be purchased, and instructions from Members respecting the transmission of the Journal to the Secretary—Mr. Richard Bremridge—17, Bloomsbury Square, W.C.; otherwise delay may be caused.

Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

To ensure accuracy, all chemical formulae, and scientific and proper names, should be written or printed with extra care; whilst if names of plants and animals are underlined, and generic names alone commenced with capital letters, much inconvenience will be obviated.

When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines—and, preferably, twice the required size—must be supplied not later than a week before the proposed date of publication.

Notes.

The Chemists' Ball takes place on Wednesday next, January 16, at the Portman Rooms, Baker Street, W., and pharmacists interested in the Benevolent Fund are reminded that the surplus receipts at the Ball are paid over to the Fund. Application for tickets (ladies', 12s. 6d. each; gentlemen's, 17s. 6d.), should be made without delay to the Honorary Secretary, A. J. Phillips, 156, Cromwell Road, South Kensington, S.W.

The first number of the *Imperial Institute Journal* appeared last week, and contains full particulars concerning the governing body and organisation of the Institute, together with special articles on commerce, agriculture, finance, Australian hardwoods, etc., reports of scientific investigations, and commercial and general intelligence.

The authorities at Kew have commenced to issue a series of hand-lists of collections of living plants in the Royal Gardens. The lists, of which the first contains a list of Polypetales, have been instituted by the Director, Mr. W. T. Thiselton Dyer, F.R.S.

The New York *Pharmaceutical Era* will henceforth appear as a weekly instead of a semi-monthly publication.

May, Roberts, & Co., Clerkenwell Road, E.C.; Lynch and Co., Aldersgate Street, E.C.; and W. Sutton & Co., Chiswell Street, E.C., have just issued new editions of their price-lists of druggists' sundries, revised up to the present month.

According to the *Medical Press*, Prof. Demosthenes of Bucharest, recommends that all medical men who are in the habit of receiving fees at the bedside, should provide themselves with metal purses that can be easily sterilised together with their contents, on returning home.

The first number of a new science weekly was published by Whittaker and Co., on January 5, under the title of the *Technical World and Science and Art*. It embodies the features of the two papers which have previously appeared under the separate titles, and deals with science, art, and technology from an educational point of view, in addition to containing articles on pure and applied science and art.

The Queen has approved the appointment of Dr. J. S. Burdon Sanderson, now Waynflete Professor of Physiology, to be Regius Professor of Medicine in the University of Oxford, in succession to Sir Henry Acland.

It is proposed to create two new degrees at Oxford University—Bachelor of Letters and Bachelor of Science—which will be conferred upon candidates who have passed the B.A. examinations, or can adduce proof of having received a good general education. They must also have given evidence of their fitness for special study or research, and that the course on which they intend to enter is such as may profitably be pursued at the University.

The *Practitioner* commences its fifty-fourth volume with a new editor—Mr. Malcolm Morris, M.R.C.S., and is now published by Messrs. Cassell and Co.

Science Progress for January contains the first part of an article on the structure and formation of coal, by A. C. Seward, M.A., Examiner in Botany to the Pharmaceutical Society. There is also an article on "Physiological Absorption," by Professor E. Waymouth Reid, and one on "The Coagulation of the Blood," by Professor W. D. Halliburton.

Mr. D. Dickinson, chemist and druggist, has been elected an Urban District Councillor for the East Ward of Hooles (Chester).

Mr. William Baxter, pharmaceutical chemist, Fordingbridge, Hants, having been elected on the local parish council, has since been elected vice-chairman.

Mr. R. A. Robinson, chemist and druggist, Brompton Road, S.W., was recently elected a member of the Kensington Vestry.

Mr. David Prosser, chemist and druggist, Sheerness, was last week unanimously elected chairman of the Sheppey Board of Guardians, for the third time, and has also been elected a district councillor. He has been a guardian and a member of the Local Board of Health for nearly twenty-five years.

The Annual Assembly of the staff of Messrs. T. and H. Smith and Co., Edinburgh, took place on Friday, December 28, in the "Lodge of Edinburgh" Hall, 19, Hill Street. Mr. D. Mackenzie occupied the chair at supper, and Mr. W. R. Cunningham acted as M.C. There were about forty couples present, and a very enjoyable evening was spent, the proceedings being pleasantly varied by several songs.

An interesting paper on "Diphtheria and its Cure," by Sir Henry E. Roscoe, F.R.S., which concludes with an appeal on behalf of the British Institute of Preventive Medicine, appeared in *The Speaker* for December 29.

Mr. James Spencer Balfour, the erstwhile M.P. for Burnley, in contributing an account of the customs and costumes of Salta to the *Pall Mall Gazette*, mentions that the male portion of society in that Argentine city habitually frequents some particular shop, generally a chemist's, where they sit for hours every evening talking and smoking.

A paper, "In Defence of Mattei-ism," by Mr. A. J. L. Gliddon, is contributed to the January number of the *Humanitarian*, edited by Mrs. Victoria Woodhull Martin.

The pharmacist appears in fiction in the current number of *The Idler*, where the troubles of Mr. Adam Chilver, Dispensing Chemist, West Kensington, with an aristocratic amateur burglar are amusingly depicted. The latter refuses to leave the premises, and makes himself at home whilst the proprietor goes to church, leaving on the table a few pamphlets he has written "for the use of young men." On Mr. Chilver's return, however, he finds his self-invited visitor has decamped, leaving a note in which he says:—"Dear Chilver,—The tracts did it. Dynamite wouldn't have, but your pamphlets were too much. Do be more tolerant and charitable."

The *Academy*, in a short notice of an enlarged and revised edition of 'The Rise and Development of Organic Chemistry,' by the late Carl Schorlemmer, mentions that the labours of this distinguished man, which continued for a third of a century in connection with Owen's College, are being commemorated by that institution. Very shortly the "Schorlemmer Laboratory" will be in working order and devoted to the study of that important and complex department of the science of which the author of the treatise referred to was so admirable an expositor and so indefatigable an explorer.

Another pharmacist has been distinguished by being appointed a Justice of the Peace (for the County of Middlesex), in the person of Major Clifford Probyn, of Grosvenor Street, W., who is also a member of the London County Council.

A case under the Pharmacy Act, 1868, was heard at Oldham County Court on Thursday, when W. Crompton, of 14, Market Place and 61, West Street, Oldham, was sued by the Pharmaceutical Society for the sale, at the latter address, of two bottles of Powell's balsam of aniseed. Penalties claimed in respect of purchases made at the Market Place shop, had been paid into court last August. Defendant produced deed showing assignment of West Street shop to his brother twelve months ago. The Judge said defendant seemed to have obstructed the Pharmaceutical Society, and though in the case of West Street he must decide against the Society, defendant must pay full costs. A full report of the case will appear in next week's Journal.

Legal and other News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

A BELGIAN POISONING CASE.—The trial commenced on Monday, at the Assize Court, Antwerp, of Madame Joniaux, who, remarks the *Sunday Times*, if found guilty, will take her place by the side of Brinvilliers and other poisoning heroines of the century. Madame Joniaux is supposed to have done away with her brother, M. Alfred Ablay, her sister, Mlle. Léonie Ablay, and her husband's uncle, M. Van der Kerohove, the motive being to obtain the insurance money payable at their deaths. The prisoner is the daughter of the Belgian General, Ablay, an aide-de-camp to King Leopold, and her first husband was M. Frédéric Faber, a book collector, well remembered in London auction rooms. M. Joniaux, her present husband, is an engineer, but he is in no way implicated in the crimes laid to the charge of his wife. Morphine or atropine is alleged to have been the poison used. This part of the case would be very weak, for M. Alfred Ablay was known to have been addicted to the morphine habit. Unfortunately for Madame Ablay, several chemists have come forward to testify that the prisoner did order morphine from them with a prescription intended for her husband. Public opinion in Antwerp is rather in favour of the supposed criminal. Madame Joniaux has been in prison since April. She declares that she is innocent, and has written out a lengthy defence of herself.

SUICIDAL MANIA OF A SERVANT.—At the recent Worcestershire Quarter Sessions, Ala Morris, alias Ridyard (17), servant, was charged with attempting to commit suicide on November 9. Mr. Marshall Todd prosecuted. Prisoner, it was stated, was found sitting on a seat by the roadside, at Great Malvern, in an almost helpless condition. She said she had taken poison, and Dr. Gray Tyrrell found that she had taken binxalate of potash or salts of lemon. She told the doctor she had been assaulted criminally. He believed prisoner suffered from suicidal mania. She wished to throw herself from the train on the way to Worcester. The jury considered that prisoner was not accountable for her actions at the time of the offence, and she was ordered to be detained during Her Majesty's pleasure.—*Birmingham Gazette*.

CASE UNDER THE MERCHANDISE MARKS ACT.—At the Bristol police court, on December 28, the magistrates were engaged for some time in hearing charges against two men named Herbert Ashley and Alfred Horace Ashley, who were charged with obtaining money by false pretences, with applying a false trade description, namely, Hood's sarsaparilla tablets, and Hood's tonic pills, to certain goods which they sold; and with having in their possession goods for sale to which a false trade description was applied. After some conversation between the solicitors and the magistrate's clerk, it was understood that the defendants pleaded guilty to selling the pills and tablets. Evidence respecting the other charges was then given, and, ultimately, the defendants were fined 10s. each on two charges and £2 each towards costs, making £10 in all. If the fines were not paid defendants would be imprisoned fourteen days. The magistrates also ordered all the goods and handbills in the possession of the police to be confiscated.—*Bristol Mercury*.

DRINKING A BOTTLE OF CHLORODYNE.—At Swansea, last week, Police-sergeant Lewis reported that a clerk at the Hafod Isha Works named W. H. Grove, living at Beech Street, volunteered the information that he had drunk a bottle of chlorodyne. He had bought the bottle that day, as he had not been feeling well, but what caused him to empty the bottle he could not say, and he did not see his mistake till after he had swallowed it. Dr. Charles, on arriving, gave Grove an emetic, and then he was removed to the hospital, where he is progressing favourably. Dr. Charles thinks the taking of the overdose was merely a foolish freak.—*South Wales Echo*.

FAILURE OF A CHEMIST.—At the Sunderland Bankruptcy Court, on January 8, before Mr. B. K. A. Ellis, John Aslin, chemist and druggist, Sunderland, was examined by the Official Receiver. His unsecured indebtedness is £263, and his assets are estimated at £232. He started business about 1854, and for the last few years has lived in the country, leaving the business to be managed by his son. His answers showed that he had not had any regular reports from his son, so that he did not know that anything was going wrong until urgently summoned to Sunderland in November last. His examination was adjourned for a fortnight.—*Sunderland Herald*.

FIRE AT A STOCKTON CHEMIST'S.—Early on Monday morning a fire took place in the shop of Mr. W. Clark, chemist, High Street, Stockton. The smell of burning was discovered about 6.30 a.m. by P.C. Stephenson, of the North-Eastern Railway Company, who gave the alarm, and the fire brigade being soon on the spot the outbreak was speedily extinguished, though not before a large amount of damage had been done to the stock and fixtures, which, however, are insured. Mr. Clark left the premises safe on Sunday night shortly before ten. He surmises that a mouse had got hold of a wax match, and nibbling it caused the fire.—*Darlington Echo*.

THE FOOD AND DRUGS ACT IN YORKSHIRE.—Mr. A. H. Allen, the Public Analyst for the West Riding of Yorkshire, in his quarterly report to the County Council says that during the quarter he examined fifteen samples of ground ginger, twelve of which were genuine. Of the other three samples one was of a suspicious character, as was adulterated with 80 per cent. of exhausted ginger, and one contained about 10 per cent. of hydrated sulphate of lime. This existed in the form of fibrous gypsum, and is Mr. Allen's opinion, must have been added intentionally. In his previous quarterly report, Mr. Allen said, with reference to a case in which the Somerset House authorities had been appealed to, but which was dismissed, that as a consequence of the position taken up by the referees it is possible for 5 per cent. of warehouse sweepings or any other rubbish to be added to all ground ginger. In the present report Mr. Allen goes on to say that one sample submitted to him was under the name of "linseed, liquorice, and chlorodyne lozenges." This is an instance of a sample on which it is impossible to report satisfactorily. The sample appeared to contain an extract of liquorice, and structures similar to linseed were detected. The composition of chlorodyne is a trade secret, and the numerous imitations vary greatly among themselves. Mr. Allen says he was, therefore, quite unable to express an opinion as to the presence of chlorodyne in the lozenges.

CHEMISTS' ASSISTANTS' ASSOCIATION.—A successful smoking concert was held by this Association at the Horse Shoe Hotel, on Wednesday last, when the chair was taken by Mr. J. S. Ward. An excellent programme had been arranged by Mr. H. H. Robins, and was thoroughly enjoyed by those present. Amongst other guests were Professors Green and Greenish, Mr. W. Gower Cross, Mr. Richard Bremridge, and Mr. Edmund White.

AN OLD PHARMACY AT SHEFFIELD.—The premises of Mr. G. T. W. Newsholme, pharmaceutical chemist, Marks Place, Sheffield, are doomed to destruction. There are records to show that a similar business has been carried on in them for nearly 150 years, and, so far as can be ascertained, it has only changed hands three times in all that long and eventful period. About 140 years ago they were occupied by Mr. Jones; he was succeeded by Mr. Gillatt, and then came Mr. Badley, who was there close upon forty years. It is seventeen years since the present proprietor came into possession, and he, like his predecessors, has held in veneration the ancient front with its bow window and small panes of glass—the only front of the kind in the centre of the city. The corporation is widening the street, and the property has to come down. Mr. Newsholme's interest in the lease has accordingly been purchased by the local authority, and he is to remove his trade fixtures and give up possession by July 1st next.

CASE OF POISONING BY ZINC CHLORIDE.—On Wednesday, December 26, a travelling tinker named Netham Smith, lodging in Union Street, Weston-Super-Mare, whilst in a semi-intoxicated state swallowed a quantity of solution of chloride of zinc in mistake for brandy. He was at once conveyed to the hospital, where emetics were administered, but he still remains in a critical state, suffering greatly from the corrosive action of the fluid. *Weston-Super-Mare Gazette.*

CHEMICAL WORKS IN BOSNIA.—In April last a company was formed, to be known as the First Bosnian Ammonia-Soda Manufacturing Company. The works of the company, which are situated at Lukarac, near Dolnja-Tuzla, are now completed, and were put in operation at the end of November. *—Industries and Iron.*

WESTMINSTER COLLEGE OF PHARMACY.—The students attending the Westminster College of Pharmacy held a very successful smoking concert at the Foresters' Arms, Borough High Street, on Friday, December 28, the chair being occupied by Mr. H. C. Wootton. Mr. P. McIntyre, the genial host, had the room tastefully decorated, and a very enjoyable evening was spent. During the evening Mr. Bryant proposed "The Westminster College of Pharmacy." The toast was well received, and responded to by Mr. Punch. The other toasts included "Success to the Candidates at the Forthcoming Examination," proposed by Mr. Ayre, and responded to by Mr. Williams. At the close the usual votes of thanks were accorded the chairman and artistes. *—South London Press.*

CASE UNDER THE MERCHANDISE MARKS ACT.—At the Guildhall Police Court, Nottingham, on January 7, Benjamin North, wholesale druggist, of St. James's Street, was summoned for selling a barrel of vinegar to which a false trade description (that of Tompson and Co.), within the meaning of the Merchandise Marks Act of 1887, was affixed. The evidence showed that the defendant had supplied vinegar of another make in Tompson and Co.'s barrels. Tompson's name, however, was covered by defendant's labels. The magistrates felt that an offence had been committed within the meaning of the Act, but thought that it might be of a technical rather than of an intentional character. Defendant would be fined 20s. without costs. *—Nottingham Guardian.*

Press Comments.

Dr. Burdon Sanderson, who has been appointed to succeed Sir Henry Acland as Regius Professor of Medicine at Oxford, was already Waynflete Professor of Physiology in the same University. Professor Sanderson's reputation is European, the value of his scientific work has been universally acknowledged, and the Prime Minister could hardly have selected a more distinguished personage. But great regret will be felt by many generations of Oxford men, as well as in Oxford itself, at the retirement of Sir Henry Acland. Sir Henry, who will be eighty this year, has been so long a picturesque and familiar figure at Oxford that the memory of man runneth not to the contrary. His speeches in Convocation were models of academic oratory, stately, sonorous, and ornate. His fine presence, his deep voice, and his mellifluous flow of personal anecdote belong to the features of the place. He is included in the select body of honorary students at Christ Church, among whom Lord Salisbury and Lord Rosebery are the latest recruits. The first three on the list are Mr. Gladstone, Mr. Ruskin, and Sir Henry Acland. In 1884 Mr. Gladstone made Dr. Acland a Knight of the Bath, and in 1890 Lord Salisbury made him a Baronet. He has enjoyed for so many years the respect and confidence of all parties that Oxford would hardly seem itself if his genial and pleasant company were withdrawn from it. *—Daily News.*

"Journalism in Japan" is the subject of an interesting article by a Japanese in the 'Revue des Revues.' Our Paris correspondent writes:—"The writer, Mr. Motoyosi Saizau, for several years settled in France, has brought out on the stage here Japanese plays turned into French. The founder of journalism in the Land of the Rising Sun was a chemist—that is to say, of the pharmaceutical order—named Kishida-Chinkau, who issued some twenty-five years ago a periodical sheet to spread the praise of his medicines. It came out twice or three times a month. Politics he was forbidden by law from touching; but in order to make his circular more interesting, he introduced into it society paragraphs and sensational police cases, and even serial stories from national legends. Still, journalism languished in Japan till the introduction of modern printing-presses, when it fast became prosperous. Kishida-Chinkau was, however, ruined by competition. The Japanese have now upwards of four hundred dailies, costing a halfpenny or a penny, and something like three hundred reviews or magazines. *—Daily News.*

Missouri chemists are preparing to hold a smelling contest at the annual meeting of the State Pharmaceutical Association next spring. That competitor who can name the greatest number of drugs by smelling them will carry off a cash prize of £20. It will probably be the first contest of the sort ever held, though druggists have always recognised the value of a well-trained nose in determining the nature of chemicals. Pharmacists are interested and amused over the smelling contest. There are few drugs, common or rare, that are absolutely odourless, and the test of smell is a recognised one among all pharmacists. A chemist must have a good nose. The odour of drugs is part of the test in all pharmaceutical colleges. *—Mascot.*

The lozenge of every-day life has hitherto been looked upon as a harmless, if unnecessary, compound. Such will be the case no longer, after the behaviour of one of the chlorate of potash family. It belonged to a man who smoked. What he smoked there is no evidence to show. Whatever it was, it made his tongue sore. He employed the lozenge to look after his tongue. He believed in it implicitly, and carried it about, quite loose, in his waistcoat pocket. The lozenge repaid his confidence by making a pocket-volcano of the pocket; and the man was in a fair way to obtain a practical experience of cremation, when they threw a pail of water over him and put him out. Of course, he was very much put out. He had not expected this of the lozenge, and he could not understand it. Science has had to explain. In the same pocket with the lozenge the smoker carried a box of matches. They were not ordinary matches, or nothing would have happened. They were safety matches. But they were made of chlorate of potash, like the lozenge; and they go off only on the box because only there they find the phosphorus to go off upon. The chlorate of potash lozenge found the phosphorus. There was the rub. The lozenge went off; the matches flared up. The conflagration became general. For the future this smoker will have to keep his lozenge under proper control, or, better still, smoke something that does not induce sore tongue. In any case, all new fire insurance policies are likely to contain a lozenge clause. *—Pall Mall Gazette.*

New Drug Companies Registered.

LONDON AND SUBURBAN PURE DRUG COMPANY, LIMITED.—Capital £28,000 in £1 shares. The object of this company is to supply London and the suburbs with drugs and patent medicines at "cash prices."

WILLIAM HAY, LIMITED.—Capital £50,000, in £10 shares. Objects: To acquire, take over as a going concern, and carry on the business of wholesale and retail chemist, wholesale and export druggist, and manufacturer of and dealer in aerated and mineral waters, and soluble essences, carried on by William Hay, at Kingston-upon-Hull.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, JANUARY 14.

Imperial Institute.

House Dinner, at 6.45 p.m.

"Adventures and Incidents in Africa," Illustrated by F. C. Selous, at 8.30 p.m.

London Institution, at 8 p.m.

"The Use of the Supernatural in Art," by Wyke Bayliss.

Society of Arts, at 8 p.m.

"Discovery of the Electric Arc Light," by Professor Silvanus P. Thompson.

TUESDAY, JANUARY 15.

Royal Institution of Great Britain, at 8 p.m.

"The Internal Framework of Plants and Animals," by Professor C. Stewart.

WEDNESDAY, JANUARY 16.

Pharmaceutical Society of Great Britain.

Library, Museum, School, and House Committee.

Imperial Institute.

Concert Dinner, at 6.30 p.m.

Ladies' Concert, at 8.30 p.m.

Royal Microscopical Society, at 8 p.m.

Annual Meeting. Address by the President.

Society of Arts, at 8 p.m.

"Commercial Synthesis of Illuminating Hydrocarbons," by Professor Vivian B. Lewes.

Edinburgh Chemists' Assistants' Association, at 9.15 p.m.

Open Meeting, postponed from January 9.

Manchester Pharmaceutical Association, at 7.30 p.m.

(Botanical Lecture illustrated), by Charles Turner.

THURSDAY, JANUARY 17.

Chemical Society, Burlington House, at 8 p.m.

"Acid Sulphate of Hydroxylamine," by Dr. Divers.

"Mercury and Bismuth Hypophosphites," by S. Hada.

"Kamala, Part III.," by A. G. Perkin.

Imperial Institute, at 4.30 p.m.

"Decorative Building Stones," by F. W. Rudler.

Royal Institution of Great Britain, at 8 p.m.

"Four English Humourists of the Nineteenth Century," by W. S. Lilly.

London Institution, at 6 p.m.

"Four English Humourists of the Nineteenth Century," by W. S. Lilly.

"Nerves and Nerve Centres in Action" (Illustrated), by Henry Power.

Linnean Society of London, at 8 p.m.

"Variation in the Floral Symmetry of *Potentilla* and *Tormentilla*, Necker. Part I., The Modes of Variations," by A. G. Tansley.

"On some Variations in the number of Stamens and Carpels," by I. H. Burkitt.

Chemists' Assistants' Association, at 8.30 p.m.

"Sophistication a Century ago," by J. S. Ward.

Liverpool Chemists' Association, at 7 p.m.

Annual Meeting. Inaugural Address by the President.

Society of Arts (Indian Section), at 4.30 p.m.

"The Lushais, and the Land they live in," by Captain John Shakespeare.

FRIDAY, JANUARY 18.

Royal Institution of Great Britain, at 9 p.m.

"Phosphorescence and Photographic Action at the Temperature of Boiling Liquid Air," by Professor Dewar.

Quekett Microscopical Club, at 8 p.m.

Ordinary Meeting.

SATURDAY, JANUARY 19.

Royal Institution of Great Britain, at 3 p.m.

"Stained Glass Windows and Painted Glass," by Lewis F. Day.

Pharmaceutical Football Club v. Fifth West Middlesex R.V., at Wembley Park. Train from Baker Street at 2.24. Commence at 3.15.

Patent Office Business.

APPLICATIONS ABANDONED BY APPLICANTS.

No. 550.—A new or improved ointment for human use.—Elizabeth Gregory, 1, East Parade, Leeds. Date of application, January 10, 1894.

No. 892.—A medicine for the human body.—Charles Edward Hope, 61, Bedford Road, Ilford. Date of application, January 15, 1894.

No. 1407.—A preparation for medical use.—Joseph Hartley Rhodes, 19, Bowling Green Street, Leicester. Date of application, January 23, 1894.

APPLICATIONS FOR PATENTS.*

Where complete Specification accompanies Application, an asterisk is suffixed.

No. 22,895-6.—David Henderson Houston, 55, Chancery Lane, London.—Improvements in photographic camera. November 26, 1894.

No. 22,902.—Fritz Lädý, 23, Southampton Buildings, Chancery Lane, London.—Manufacture of bismuthoxy-iodide-gallate.* November 26, 1894.

No. 22,904.—John Imray, 23, Southampton Buildings, Chancery Lane, London.—Manufacture of new blue colouring-matters which resist alkaline carbonates. (*La Société Anonyme des Matières Colorantes et Produits Chimiques de St. Denis, France.*) November 26, 1894.

No. 22,905.—Carl Eduard Bergeon, 23, Southampton Buildings, Chancery Lane, London.—Improved method of, and apparatus for, effecting the vulcanisation of caoutchouc articles. November 26, 1894.

No. 22,914.—Sydney Pitt, 24, Southampton Buildings, Chancery Lane, London.—The production of fast yellow dyestuffs from the sulpho acids of dehydrothiitol uidine or analogous bases (*Leopold Cassella & Co., Germany.*) November 26, 1894.

No. 22,917.—John Brook, Arthur Edward Wareing, and Ferdinand Harter, 47, Lincoln's Inn Fields, London.—Improvements in the treatment of the residual solutions of the ammonia soda process, and in the recovery therefrom of ammonia and chlorine. November 26, 1894.

No. 22,919.—Thomas Barnet Grant, 15, George Street, Mansion House, London.—An electrically driven hydro-extractor. November 26, 1894.

No. 22,929.—Elise Weiher and Rodolphe Croese, 45, Southampton Buildings, Chancery Lane, London.—An improved manufacture of artificial ivory. November 26, 1894.

No. 22,953.—Andrew George Adamson, 154, St. Vincent Street, Glasgow.—Improvement in, and connected with, the developing of photographs.* November 27, 1894.

No. 22,961.—Thomas Blake, 8, Quality Court, Chancery Lane, London.—An improved polishing liquid for polishing metals. November 27, 1894.

No. 22,969.—Robert Joseph Rastrick, "Trentham," Emsworth, Hants.—Improvements in the treatment of rheas and other fibrous plants. November 27, 1894.

Unclassified Advertisements.

EXPERIENCED qualified ASSISTANT wanted, for light Retail and Dispensing. 25 to 30. Must be an accurate Dispenser and well recommended. Comfortable permanency to suitable man. Particulars to GOULD, Chemist, Teddington.

WANTED immediately.—A smart, gentlemanly ASSISTANT, not under 23 years, in an old-established Dispensing and Prescribing business. Good chance for improvement. Near Bloomsbury Square. Height about 5 ft. 8 in. Non-smoker preferred. Personal interview if possible. CHEMIST, 60, Lamb's Conduit St., W.C.

MECHANICAL ASSISTANT, used to first-class work, plate, vulcanite, continuous gum, &c. Salary 50s. 11, Shakespere St., C.-on-M., Manchester.

* From the *Illustrated Official Journal (Patents)*.

Notes.

BIOLOGY NOTES.—The Technical Instruction Committee of the Essex County Council is publishing a monthly pamphlet, entitled 'Biology Notes,' in connection with the scheme for establishing a systematic course of scientific instruction in biology in the district. Lectures on plant diseases, etc., are given under the direction of Mr. Houston, and practical courses of study are conducted at the Chelmsford Laboratory, where also agricultural problems are fully considered.

THE EXTRA PHARMACOPŒIA.—Mr. H. K. Lewis, of Gower Street, announces that a new edition of Martindale and Westcott's 'Extra Pharmacopœia' is in course of preparation.

EDUCATIONAL WORK AT HOME AND ABROAD.—A new post has been created under the Education Department for the purpose of obtaining special information and issuing special reports, from time to time, in relation to educational work at home and abroad. The first "Director of Special Enquiries and Reports," as the new officer is to be styled, is M. E. Sadler, Student of Christ Church, and Secretary of the University Extension Delegacy at Oxford.

SEROTHERAPY AT THE PASTEUR INSTITUTE.—The Pasteur Institute, Paris, has, according to the *Lancet*, received up to the present £24,440 to enable the authorities to provide a supply of antitoxic serum. The French Chambers have also voted £4000 for the same purpose. A stud of 136 horses is now kept, and arrangements have been made for the immediate despatch of tubes of serum to any part of France.

SILVER MEDAL FOR A SCIENCE STUDENT.—The silver medal given by the Mayor of Kendal (Mr. Wm. Bindloss) for the best science student of the year 1894, at the local School of Science and Art, has been awarded to Albert Storrs Walker.

BUSINESS CHANGE.—Messrs. Joseph T. Preston and Alfred Preston have retired from the firm of Thos. Hodgkinson, Prestons, and King, of 81, Bishopsgate Street Without. The remaining partners, Messrs. J. Classon Preston, Herbert E. King, and Alfred Chas. Preston, will in future carry on the business under the same style as formerly.

BEESWAX AS A DRUG.—In a case heard at the South-Western Police Court, Mr. Denman has decided that beeswax sold at a drug store is to be regarded as a drug, and being therefore within the scope of the Adulteration Act, the presence of 50 per cent. of paraffin in an article sold under that name, constituted an offence against the Act. On those grounds Day's Southern Drug Company was subjected to a fine of 40s. with £3 3s. costs.

EDINBURGH PHARMACY BALL.—The Edinburgh Chemists' Ball is to take place in the Masonic Hall, George Street on Thursday, 24th inst., at 9 p.m.

DIRECTORSHIP OF FORESTS AND GARDENS.—The *Athenæum* is glad to learn that the ill-advised scheme for destroying the post of Mr. H. N. Ridley as Director of Forests and Gardens to the Government of the Straits Settlements has broken down. Not only would the abolition of this scientific post have been a mistake, but the loss of Mr. Ridley would have been felt by every naturalist who has an interest in the flora or fauna of the region round Singapore.

BULLETIN OF PHARMACY.—In the December number of the *Bulletin of Pharmacy* a short biographical sketch is furnished of Professor Oscar Oldberg, Ph.D., Dean of the Illinois College of Pharmacy, who will henceforth act as editor of the paper.

APPOINTMENTS AND ELECTION RESULTS.—Mr. W. B. Edgeler, chemist and druggist, Petersfield, Hants, was returned at the head of the poll at the recent election of urban district councillors, and has since been unanimously elected chairman of the council. On Saturday last, also, he qualified as Justice of the Peace for the county of Southampton. Mr. R. H. Lowe, chemist and druggist, Wolverhampton, has been elected on the local Board of Guardians, with which he has been connected since 1873. Mrs. Annie Phillips, the wife of Ald. J. Phillips, pharmaceutical chemist, Wigan, has also been elected a Poor Law Guardian. Mr. Henry Peet, chemist and druggist, Mount Pleasant and Ranelagh Place, Liverpool, has been appointed a magistrate for the city of Liverpool. At the recent election for the Board of Guardians Mr. Peet was returned at the head of the poll. For the last ten years he has been a member of the Select Vestry, and during the last four years has been chairman of the Board.

TRADE MEETING AT MANCHESTER.—As already announced, the President of the Pharmaceutical Society will address a special meeting of the trade in the Memorial Hall, Albert Square, Manchester, on Wednesday afternoon next.

THE CHEMISTS' BALL.—The chemists' twenty-ninth annual ball, held at the Portman Rooms, London, on Wednesday last, was exceptionally successful, some 250 guests being present. The indefatigable T. C. W. Martin, as usual, acted as M.C., whilst the President of the Pharmaceutical Society once more took the chair at supper and referred in his customary happy style to the invaluable services rendered by the Honorary Secretary, Mr. A. J. Phillips. Mr. Cartelghe also went far towards disproving the notion that with increasing years comes lack of vigour, for his figure was prominent in almost, if not quite, every dance. Other Members of the Pharmaceutical Council present were Messrs. Martindale and Warren, whilst Mrs. Cartelghe and Mrs. Martindale set a good example to the ladies present in keeping the proceedings brisk. Amongst other official visitors were Major Probyn, J.P., L.C.C., Mr. T. H. W. Idris, L.C.C., Mr. Richard Bremridge, Professor Greenish, and Mr. Edmund White, the latter being accompanied by Mrs. White.

MANCHESTER PHARMACY BALL.—The second annual ball and musical promenade in connection with the Manchester Pharmaceutical Association will be held in the Hulme Town Hall, Manchester, on Wednesday next, January 23. Applications for tickets should be made at once to the honorary secretary, A. Blackburn, 7, Exchange Street, Manchester.

A LAKE OF GLAUBER SALT.—At the last meeting of the Society of Chemical Industry, a paper by Dr. D. Harvey Attfield was read, in which he described a natural solidified sodium sulphate lake in Wyoming, U.S.A. This lake occurs in the oil district, is 1200 yards long, covers about 110 acres, and consists of a solidified mass of practically anhydrous sodium sulphate, with 6 p.c. of carbonate, 1.5 p.c. of chloride, and 6.9 p.c. of water of crystallisation.

COMPRESSED DRUGS.—The *Practitioner* suggests, with regard to compressed drugs, that the prescriber's aim should not be to get every prescription into tablet form without considering whether his therapeutic object in certain cases will not be better attained by ordering his remedies in a liquid form.

THE 'PRACTITIONER.'—The new editor of this medical publication has introduced certain new features into it, which render it more attractive from a purely literary point of view. It will now deal with "Practical Medicine" in the widest sense of the term, and there will be an article summarising and commenting on the medical events of the month as well as a "medico-literary causerie," a short summary of matters relating to public health, and "practical notes" on diagnosis and treatment. The readers of the *Practitioner* are to be congratulated on the general improvement manifested.

NEW BOTANICAL WORKS.—Amongst announcements of forthcoming books are 'Fossil Plants, a Manual for Students of Botany and Geology,' by A. C. Seward, M.A., F.G.S., one of the recently appointed Examiners of the Pharmaceutical Society; and 'Elements of Botany,' by F. Darwin, M.A., F.R.S. They will form part of the Cambridge Natural Science Manuals issued by the Cambridge University Press.

SOCIETY OF PUBLIC ANALYSTS.—The annual dinner of this Society, which will attain its majority in a few months, was held on Wednesday at the Criterion Restaurant, London. The chair was taken by Dr. Thomas Stevenson, the newly-elected President, who spoke in hopeful terms of the present position and future prospects of the Society. Dr. Stevenson was one of the six founders of the Society of Public Analysts, and, as is well-known, is Scientific Analyst to the Home Office and Government Visitor at the Pharmaceutical Society's examinations.

DEATH OF MRS. HOOPER.—On Monday last, Mrs. William Hooper, widow of a Founder of the Society, whose death was so recently recorded, died at the age of 91, at Camborn Lodge, Surbiton Hill Park.

Legal and other News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

FIRE AT BURROUGHS, WELLCOME, AND CO'S.—An outbreak of fire occurred on the night of January 17 upon the premises of Messrs. Burroughs, Wellcome, and Co., manufacturing chemists, at Snow Hill Buildings, Snow Hill, City. Prompt action of the brigade, however, saved the building from destruction, although considerable damage was done.

PHARMACEUTICAL SOCIETY OF IRELAND.—At the January (quarterly) examinations, held at Dublin and Belfast, for licence to act as a registered druggist, the following passed:—Messrs. T. Batt, H. D. S. Corry, R. Hastings, S. R. McConway, and J. K. Miskelly, jun. Two candidates were rejected.—*Freeman's Journal*.

LIVERPOOL PHARMACEUTICAL STUDENTS' SOCIETY.—The fifth annual dinner of this society was held on Thursday, January 10, at the Alexandra Hotel, Dale Street. Between sixty and seventy were present. Mr. R. H. Mitchell, the president, was in the chair, and was supported by Dr. Nevins, Dr. Larkin, Dr. Logan, Dr. Symes, Mr. H. Peet, J.P., Mr. E. Davis, F. E., and Mr. Charles Sharp, F.L.S. "The Medical Profession," proposed by Mr. J. Shacklady, and responded to by Dr. Nevins, the "Pharmaceutical Students' Society," proposed by Dr. Symes and responded to by Mr. R. H. Mitchell; the "Pharmaceutical Society," proposed by Mr. F. Walker, and responded to by Mr. J. Smith; the "Visitors," proposed by Mr. R. C. Cowley, and responded to by Mr. Charles Sharp and Mr. H. Peet; "Our Musical Friends," proposed by Mr. J. R. Burn, and responded to by Mr. F. L. Josephs, were all heartily received. A long and interesting programme of songs, etc., was much appreciated, the principal contributors being Messrs. Frank L. Joseph, Paul Waring, A. Robertson Field, W. C. Kingdon, and E. Vaughan.

Food and Drugs Act Prosecutions.

THE SALE OF TINCTURE OF IODINE.—At Brentford Petty Sessions, on Saturday, before General Tremeneers (Chairman), Sir George S. Meason, and Messrs. M. Sharpe, G. G. Mackintosh, J. Allen Brown, A. S. Montgomery, and other justices, Frederick Fresson, chemist and druggist, of High Street, Brentford, was summoned by Inspector W. Tyler, under the Food and Drugs Act, for "that he did unlawfully sell to the said Walter Tyler, to his prejudice, a certain drug, to wit, tincture of iodine, which was not of the nature, substance, or quality demanded by the said Walter Tyler, it not being ordinary tincture of iodine as prescribed by the British Pharmacopoeia."

The defendant appeared in person.

Inspector Tyler, in stating his case, relied on the *dictum* in *Knight v. Bowers*, and said it was only necessary to prove that the tincture was either not of the nature, or substance, or quality demanded. He was conducting the prosecution with a view to teaching chemists that they must prepare drugs according to the standard of the British Pharmacopoeia, and that they must follow no other guide. To support this view he quoted the 54th section of the 21 & 22 Vict., requiring "the General Council to prepare a book, called the British Pharmacopoeia, in which the manner of preparation of medicines and compounds shall be laid down." He

admitted, however, that this section had not been incorporated into the Food and Drugs Act of 1875 (a subsequent measure), though, according to Bell, an authority, the sub-committee which framed the Act advised it should be.

The evidence showed that a sample of tincture of iodine was bought by the inspector's assistant and handed to the inspector, who, astonished at the light colour of the compound, asked if some mistake had not been made, to which the defendant rejoined that there were two kinds of that particular tincture. The legal formalities were carried out, and the certificate of the analyst, Mr. E. Bevan, read: "The sample is not ordinary tincture of iodine as prescribed by the British Pharmacopœia." The defendant did not dispute the certificate, but urged that it did not go so far as it should, and give the specific gravity of the component parts of the sample.

Mr. Bevan was called to support his certificate, and, questioned at some length by the defendant, said that he was so astonished at the readiness with which he arrived at his decision, that he wrote Inspector Tyler inquiring if a mistake in the description of the compound had not been made somewhere. It not being part of his duty to do so, he did not go into the specific gravity of the sample, but it lacked one essential to real tincture of iodine, and that was free iodine. It was simply decolorised tincture of iodine. The whole of the foregoing evidence was corroborated by Mr. Robert Watts, of Apothecaries' Hall, London, past president of the Sheffield Pharmaceutical and Chemical Society, and late lecturer upon pharmacy to the Sheffield School of Pharmacy. He carried the case further by deposing that there was only one official preparation known as tincture of iodine; that in question was decolorised tincture of iodine. The former should consist of half an ounce of iodine, half an ounce of potassium iodide, and a pint of rectified spirit. Defendant's drug was of little value, practically valueless, and was what was known, vulgarly, as an old woman's remedy.

Questioned by the defendant, he at once admitted that there was an authority known as the British Pharmaceutical Conference, whose opinions were fit for recognition by chemists. In 1889 or 1890 they published a formula for decolorised tincture of iodine. If any one asked him for white iodine he should give them decolorised iodine, the cost of making which was greater. It was asked for occasionally, and generally stocked by chemists.

The defendant, availing himself of the powers under the Act, elected to be sworn. His evidence was that he believed the Inspector's assistant asked for white iodine, and he supplied this, taking the precaution to put on the bottle a label, "Prepared according to the British Pharmaceutical Conference." He had a right to sell the drug as it was sanctioned by that conference. It was possible the label could not be seen when the bottle was wrapped up. He did not mark the bottle "white iodine" because he considered the label sufficient intimation of its distinction from the ordinary brown iodine.

Mr. J. A. Brown, one of the magistrates, in view of the difference in the medicinal qualities of the two compounds, thought that the use of the word "white" was important, so that the public should not be misled.

The defendant, in reply to Inspector Tyler, admitted that the British Pharmacopœia was the standard by which drugs should be dispensed, but when told that he had been selling iodine not in accordance with such authority, did not answer, except to say that the public liked it and asked for it, as it did not discolour the skin so much as the brown tincture.

The Chairman, in giving the decision of the bench, said: "The majority of the magistrates consider there

has been no fraudulent intention on the part of the defendant. Technically, he has made a mistake, and we were in doubt if we should not fine him for making the mistake. He was asked for iodine, and gave a different substance, but we—or the majority—do not think he did so with any idea of fraud. The summons is dismissed, but we think the county officers did quite their duty."

PARAFFIN WAX IN BEESWAX.—On January 9, at the Bristol police court, before Messrs. Sparke Evans and E. B. Colthurst, George Stevens, shopkeeper, of Old Market Street, was summoned under the Food and Drugs Act for selling one pound of beeswax containing 60 per cent. of paraffin. Inspector Thomson said that on December 10 he called at defendant's shop and purchased one pound of the best beeswax, paying 2s. 6d. The analysis showed that it contained 60 per cent. of paraffin. Mr. Cross, for the defence, said that Stevens bought the beeswax as pure from a wholesale druggist in Bristol, who purchased it from another druggist. They had good reason to doubt the accuracy of the analyst's certificate, their own analysis, roughly taken, not showing anything like 60 per cent. It was usual for bee-keepers to put in a hive a foundation of common wax, which might account for the smell of paraffin. He asked that a sample might be sent to Somerset House for analysis. The magistrates agreed to this being done.—*Bristol Mercury*.

LAUDANUM DEFICIENT IN ALCOHOL.—On Jan. 9 G. R. Heal, of Old Market St., Bristol, was summoned for selling 8 ounces of laudanum containing only 25-25 per cent. of alcohol. Inspector Thomson bought the laudanum on December 10 and had it tested. An assistant from defendant's shop suggested that the alcohol had evaporated, the liquid having been kept in a corked jar. There was only a small sale for it. Fined 20s and costs.—*Bristol Mercury*.

Press Comments.

THE NOSTRUM STAMP.—It appears that in 1860 the Government tax on patent concoctions produced £43,600, and that in 1892 this figure had risen to £240,000. We have pointed out that the journals of the various religious sects are the chief offenders, and seem to be particularly favoured by the advertisers of these nostrums. But why should the State, so solicitous of checking fraud and misrepresentation in other quarters, not protect the ignorant from this traffic, instead of actually conniving at it? A poor country like Italy, with embarrassed finances, declines to fill its exchequer by drawing a revenue from fraud. Every proprietary article in that country must have printed clearly on each box or bottle the name and exact amount of each ingredient. The owner may give to his production what fancy name or price he chooses; he is not required to divulge any particular method or art employed in manufacturing his goods, or in rendering them more pleasant to the eye and palate; but he must make no false statements as to the source, nature, or power of any drugs used, or as to the effect of his medicine. For example, he may advertise his "Pectoral Pick-me-up" as the "soveran'st thing on earth" for coughs, colds, bronchitis, pleurisy, etc. But on the label he must state the name and quantity of each ingredient in every dose; and if he suppressed the fact that opium was present, or gave its dosage incorrectly, or claimed that his pick-me-up was a certain cure for consumption, he would at once be prosecuted and convicted of fraud. Having to give the plain, matter-of-fact prescription, he, of course, does not attempt to gull people by advertising his

nostrum as made of "Oriental flowers grown in his own gardens in Arabia." The public buys his goods with open eyes, and not from fraudulent misrepresentation. Can we not take a lesson from Italy?—*British Medical Journal*.

It is remarkable how prone the medical press is to revert to the mistaken notion that the tax imposed upon secret quack medicines is, on the part of the State, a connivance at fraud and misrepresentation. If the medicine stamp duty were abolished, ignorant and credulous persons would be still more at the mercy of the nostrum advertiser. The practice in Italy is to prohibit altogether the sale of secret medicines, and consequently a medicine stamp duty is unnecessary.—[Ed. Ph. J.]

AMENDMENT OF THE PHARMACY ACT.—A strong movement is on foot among chemists and druggists with the view of securing an amendment of the Pharmacy Act so as to bring limited companies under its provisions, the courts having recently decided that, under the law as it stands, such bodies cannot be proceeded against for infringements of the Statute, on the ground that the latter deals only with offences committed by "any person," and not by any association of persons. It is contended that such a state of the law gives an unfair advantage to companies in their competition with individual registered practitioners. In connection with the agitation, a secondary question has arisen as to whether, if a change of the law be pressed for as against the drug companies, it will not be necessary to give up what is known as the "Widows' Clause," which, in the case of a deceased chemist, permits his widow or other executor to carry on the business with the assistance of a qualified manager. This is the only exception to the rule forbidding unregistered persons to sell drugs, and it is much valued; but the trade would apparently be willing to sacrifice it if by so doing it could get at the limited companies. These bodies, it is alleged, are simply formed to evade the Act, and by thus escaping the penal liabilities of the ordinary practising chemist they are able to undersell and ruin him; and the strong feeling on the subject will find expression in Parliament in the form of a private member's bill.—*Liverpool Echo*.

Obituary.

Notice has been received of the death of the following:—

On January 5, Samuel Hall, chemist and druggist, Eastbourne. (Aged 75.)

On January 9, W. R. Ross, chemist and druggist, Hawick. (Aged 48.) Mr. Ross was enjoying a game of curling on the previous afternoon, when he complained of severe pain. An operation was performed, but the bowel had been ruptured, and Mr. Ross died as stated after a few hours of great agony. He had been in business in Hawick some eighteen years.

On January 10, Mr. James Richard Gardner, pharmaceutical chemist, Plymouth. Mr. Gardner died from Bright's disease, at the Royal Naval Hospital, Stonehouse, where he was dispenser in charge of stores. He had been ailing for some months, but only took to his bed about six weeks since. He was born at Devonport, served his apprenticeship with a chemist and druggist, and afterwards joined the medical department of the Navy, his first appointment being at Stonehouse Hospital. After serving in several foreign hospitals under the Crown, he was appointed to the Melville Hospital, Chatham, in charge of stores; and on the retirement of Mr. Gordon Ewing, dispenser

in charge of stores at Stonehouse Hospital, in 1882, Mr. Gardner was transferred to that establishment.

On January 10, Frederick Hewitt, chemist and druggist, Bolton. Mr. Hewitt, who was only twenty-four years of age, was an Associate of the Society. He was married only nine weeks ago, and was at business as usual on the previous Monday, but, feeling unwell, he proceeded home. Alarm symptoms manifested themselves, and he was found to be suffering from typhoid fever, which ended fatally as stated. Mr. Hewitt had been in business some six months, having taken over the business of the late Mr. N. Cunliffe.

Dr. Karl von Haushofer, Director of the Royal Technical Academy at Munich, Professor of Mineralogy and Metallurgy, member of the Academy of Science, of many learned Societies, and of the Supreme Council for Schools, has died at Munich, after a long and severe illness. He was a son of the landscape painter, Max Haushofer, and was born at Munich on the 28th April, 1839. He studied at Freiburg and Munich, established himself as a private lecturer in mineralogy at the University of Munich, and was appointed Professor when the Polytechnic School was transformed into the Technical Academy. By his investigations of asterism and Brewster's optical observations on calcite, he struck into a path which has since led to very important results in the physics of crystals. His treatise on the constitution of natural silicates and his investigation of the decomposition of granite by water belong to the chemical department of mineralogy; in later years he devoted his attention more to the crystallographic study of numerous organic combinations. He published the results of his studies on the development of micro-chemical methods in the reports of the Sitzings of the Munich Academy, and in a treatise entitled 'Microscopic Reactions.' He was one of the founders of the Austro-German Alpine Club, and edited its periodical organ for several years. After the retirement of Dr. von Banernfeld in 1889, he was appointed Director of the Technical Academy.—*Standard*.

Mr. J. V. Whitaker, a member of the firm of Messrs. Whitaker and Sons, Warwick Lane, the proprietors of "Whitaker's Almanack," has died at his residence in Kensington. The deceased, who was attached at one time to the *Philadelphia Ledger*, had a Transatlantic experience, and during his stay on the American Continent took part in the great Civil War. Returning to England, he became actively engaged in the management of the business founded by his father, who survives him, the editorship of the *Booker* being his favourite work. He was in his fiftieth year, and it is only within the last few months that his health has failed.—*Standard*.

Poisoning Cases.

Laudanum.—Elizabeth Hewitt, aged 36, died at Sneyton on Friday, January 4, from the effects of laudanum, self-administered. Verdict: "Committed suicide by taking a dose of laudanum while in a state of unsound mind, through the influence of drink."—*Nottingham Guardian*.

Chlorodyne.—Henry Edmund Farthing, aged 33, died on Sunday, Jan 6, at 8, Crossley Street, Liverpool Road, London, from the effects of an overdose of chlorodyne taken as a remedy for a cough. Verdict: "Death from misadventure," and added a rider to the effect that bottles containing chlorodyne should be marked poison.—*Islington Gazette*.

Laudanum.—Robert Aitken, aged 50, died at 9, Newport Street, Edinburgh, on Friday, January 4, from the effects of an overdose of laudanum. The occurrence is reported to the police as "a case of suicide." It appears that Aitken had been out of work for a long time, and was in depressed spirits.—*Edinburgh Evening News*.

Poisonous Liniment.—Frederick Stead, aged 48, died on Sunday, January 6, in the Newcastle Infirmary, from the effects of a poisonous liniment, self-administered. Verdict: "Suicide while in a despondent state of mind."—*Newcastle Daily Chronicle*.

Morphine.—Emily Susan Marks, aged 35, died at 23, Cherry Orchard Road, Croydon, on Sunday, January 6, from the effects of an overdose of morphine. Verdict: "Death was the result of an overdose of morphine."—*Morning Post*.

Laudanum.—Ann Hopson, aged 77, of South View, High Street, Brighouse, died at Manchester, on Sunday, January 6, from the effects of an overdose of laudanum. Verdict: "Accidental death from laudanum, due to human overdose taken to produce sleep."—*Manchester Evening News*.

Laudanum.—Allan Holmes, aged 59, died at 81, John Street, Workington, on Friday, January 4, from the effects of laudanum, self-administered. Verdict: "Committed suicide whilst temporarily insane."—*Whitehaven Advertiser*.

Carbolic Acid.—George Fisher, 63, committed suicide at Kilburn by drinking carbolic acid on January 6. Verdict: "Deceased committed suicide by drinking carbolic acid whilst in a state of mental aberration."—*Hampstead Express*.

Carbolic Acid.—Marguerite Humphery, 24, died at Addlestone on January 11, apparently as the result of drinking carbolic acid.—*Morning*.

Books, etc., received.

THE RISE AND DEVELOPMENT OF ORGANIC CHEMISTRY. By CARL SOHRELEMMER, LL.D., F.R.S. Revised edition edited by ARTHUR SMITHells. Pp. 280. London: Macmillan and Co. From the Publishers.

LESSONS IN ORGANIC CHEMISTRY. Part I. Elementary. By G. S. TURPIN, M.A. (Camb.), D.Sc. (Lond.). (Illustrated). Pp. 140. Price 2s. 6d. London: Macmillan and Co. From the Publishers.

INORGANIC CHEMISTRY FOR BEGINNERS. By Sir HENRY ROSCOE, F.R.S., D.C.L., etc., assisted by JOSEPH LUNT, B.Sc. (Vict.), F.C.S. (Illustrated). Pp. 245. Price 2s. 6d. London: Macmillan and Co. From the Publishers.

PHYSIOLOGY FOR BEGINNERS. By M. FOSTER, M.A., M.D., F.R.S., and LEWIS E. SHORE, M.A., M.D. (Illustrated). Pp. 241. Price 2s. 6d. London: Macmillan and Co. From the Publishers.

PRACTICAL BOTANY FOR BEGINNERS. By F. O. BOWER, D.Sc., F.R.S. (Illustrated). Pp. 275. Price 2s. 6d. London: Macmillan and Co. From the Publishers.

POCKET MANUAL ON CHOLERA. By Dr. D. N. BANERJEE, M.A., B.L. Pp. 28. Price 1s. Published by the Calcutta Homoeopathic Charitable Dispensary, 43, Churebagon. From the Author.

REPORT OF THE CALCUTTA HOMOEOPATHIC CHARITABLE DISPENSARY FOR THE YEAR 1893-94. Pp. 19. Calcutta: Published by the Dispensary. From Dr. D. N. Banerjee.

Notes and Queries.

[The Editor will be glad to receive for publication notes of practical interest to pharmacists, and will also endeavour to furnish suitable replies to any queries that may be sent by readers.]

PIPERAZINE.

[793.] In answer to W.N.G.L., a correspondent suggests the advisability of enclosing the piperazine in cachets, as this has proved satisfactory in his experience, no complaints being received, but repeat orders. The cachets must of course be kept in a dry place.

PHOSPHORUS PILLS.

[794.] Yet another method for dispensing phosphorus in pills is suggested by M. Ledoux, of Liège, who heats anhydrous wool-fat, 4 Gms, and phosphorus 6 Gg., in a capsule, on a water-bath at a temperature about 45°, until the phosphorus is melted. The mixture is then stirred with a slightly warmed pestle until cool, after which powdered marsh-mallow, *q.s.* for 120 pills, is added. The finished pills should be rolled in powdered talc and preserved in the same, sheltered from the light (*Journs. de pharm. de Liège, et d'Anvers*).

SODIUM SALICYLATE AS A CLEARING AGENT.

[795.] Sodium salicylate dissolved in its own weight of water is recommended by W. Lenz as a clearing agent for vegetable sections. It is said to possess an advantage over chloral hydrate, in rapidly converting starch granules into a transparent jelly, which remains clear on adding water, is not affected by the addition of glycerin, and is coloured blue by iodine. The salicylate is also said to alter the cell membranes less than chloral, and its solution mixes well with oil of cloves (*Chem. Zeit., and Répertoire*).

IATROL.

[796.] This is the name given to a new antiseptic manufactured by the Clinton Pharmaceutical Company of Syracuse, New York. The preparation is described by the *Pharmaceutical Era* as a crystalline compound "obtained by the action of nascent iodine upon one of the aniline group." It is said to be inodorous, non-irritant, a powerful cicatrizing, well adapted for use as a dusting powder, and insoluble in water, glycerin, fixed oils, and soft paraffin, but can be incorporated with these in all proportions in the preparation of ointments and suppositories.

PURIFICATION OF ETHER.

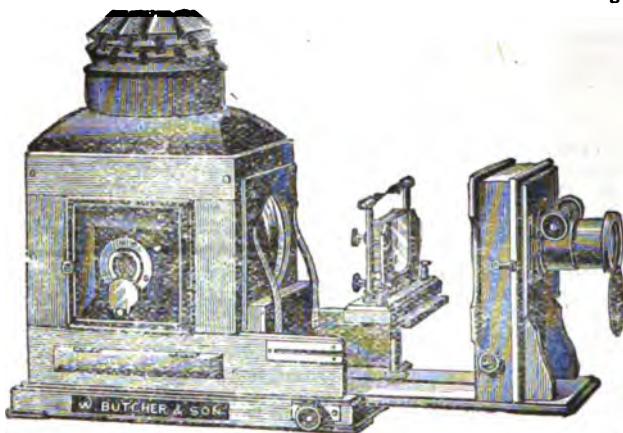
[797.] M. Eckenberg states that approximately pure ether for analytical purposes can be obtained from commercial ether by adding to the latter 5-10 p.c. of a liquid paraffin, that boils above 300°C., and distilling at 40° to 50°. The alcohol and oxidation products are retained in the retort by the paraffin, whilst the water, if much be present, will form a layer beneath the latter. Acids and other objectionable impurities may be removed by this method, which is also applicable for purifying chloroform, acetone, etc. Subsequent heating to 120° expels the impurities from the paraffin and renders it fit for further use (*Chem. Zeit.*).

Novelties.

[Under this heading it is proposed to publish, from time to time, descriptions of new appliances and apparatus, and other novelties of interest to pharmacists. In submitting such articles for notice, full particulars should be sent accompanied, if possible, by a block of suitable size for the Journal columns.]

"PRIMUS-DRESSER" COMBINATION LANTERN.

This lantern, made by W. Butcher and Son, Blackheath, London, S.E., has a handsome polished mahogany body, with rosewood doors; and Russian iron lining, dome, and top. It is fitted with a 4 inch meniscus and $5\frac{1}{4}$ inch plano compound condensers; massive double-pinion brass rack front; lens mounted in cylindrical form, interchangeable, either 4, 6, 8, or 10 inch focus; incandescent gas jet, limelight jet, or oil lamp; carrier to take $\frac{1}{4}$ or $\frac{1}{2}$ plate negatives, and an adjustable table for scientific demonstrations. For projection purposes, it forms a perfect single optical lantern, arranged for use with long or short focus lenses, having a bellows extension front, and fitted with a



"PRIMUS-DRESSER" COMBINATION LANTERN.

4 inch meniscus compound condenser, fitted with the incandescent gas light, which gives as well-lighted a picture as the ordinary refulgent oil lamp. Limelight can be used in the lantern if preferred. For scientific demonstrations the bellows closes up to the front, leaving an open space, and for enlarging the lantern is made to take and is supplied with a $5\frac{1}{4}$ inch plano-convex compound condenser, also with carriers to take $\frac{1}{4}$ or $\frac{1}{2}$ plates. The condenser will cover the whole of a $\frac{1}{4}$ plate negative and the best part of a $\frac{1}{2}$ plate. The incandescent gas light



FOLDING TOOTH BRUSH.

gives a perfect illumination for enlarging, and is much more convenient than limelight or oil. The lens provided may be used for enlarging, but, if preferred, any ordinary E.R. lens is equally suitable. The "Primus" Cylinder Box, by the same makers, is a strong box for containing compressed gas cylinders, forming a substantial stand when in use, and also a case for transit. It is thoroughly well made in hard wood, with hinges, hasp for padlock, and handle.

A PATENT TOOTH BRUSH.

In these days of foreign travel, etc., a tooth brush that folds up and goes into a pocket is a distinct advantage, and such an invention has recently been patented by Mr. H. A. Wanklyn, 17, Manchester Avenue, London, E.C. The tooth brush of which the usual handle is cut off about an inch below the bristles is fixed by means of a screw into the neck of a nickelled metal case, turning on the screw as on a hinge. The brush folds into the case, which is made to fit it exactly, and packs into the compass of $8\frac{1}{4}$ inches. The part of the case made to cover the bristles is perforated for purposes of ventilation, and the neat little article is sold in boxes containing besides two extra brushes, a small instrument for undoing the screw, so that when worn out the old tooth brush can be removed and a new one substituted.

PHOTOGRAPHIC NOVELTIES.

All former vignetting masks that have been on the market had the great drawback of being only one shape, so that the vignetting could not always be done to suit the



"PRIMUS" CYLINDER BOX.

print. The "Iris" vignetting mask overcomes all this and adapts itself to any required shape. The frame A is made of wood—upon which are overlapping vulcanite flaps which turn on pivots—and has a black rim, which is laid on the printing frame. The flaps can be arranged to any shape to give any size or form of vignette. Though the flaps can be moved easily, they will not shift by themselves. They are well made and will last a long time, whilst much time is saved by using them, and the best vignettes are obtained. They are made by the well-known firm of



IRIS VIGNETTING MASK.

R. Lechner (W. Müller), Vienna, who hold the patents, and are supplied in three sizes by C. A. Rudowaky, 1, Guildhall Chambers, London, E.C., who is also agent for the patent "grain" bromide paper, manufactured by Hessekiel and Co., Berlin. This paper is manipulated the same as other bromide papers, but is said to give superior results and to be more easily touched up. The prints produced are described as brilliant, deep, and vigorous, whilst contact prints resemble good platinotypes.

THE BANDAGE SHOOT.

This ingenious appliance (Registered No. 244,102), hangs on the wall, takes up little room, and can be quickly unhooked and carried to the scene of any accident. It appears to be a very handy and cleanly method of storing bandages. No time need be lost searching for size of bandage wanted, and it is impossible to run out of stock without warning. The shoot projects from wall only 2½ inches, and is made in two sizes—the large size, 3 feet 3 inches by 1 foot 6 inches; small size, 1 foot 8 inches by 8 inches, and the former holds 2 dozen



4 inches, 2 dozen 3 inches, 2 dozen 2½ inches, 2 dozen 2 inches, 8 dozen 1 inch finger, whilst the other holds 1 dozen 3 inches, 1 dozen 2 inches, 1½ dozen 1 inch finger. At the back of the shoot, which is made by Reynolds and Branson, 13, Briggate, Leeds, are two wooden splints, suitable for arm or leg, and at the right-hand side there is a roll containing 6 yards half-inch ribbon plaster.

Photographic Notes.

Photographing Glass Vessels.

For the photographing of engraved glass vessels, the following method is recommended in *Die Photographie*. In order to reduce the vigour of the impression of the back surface, the front side of the glass should be rubbed with powdered talc and lightly dusted with a soft cloth so as to leave the talc only on the etched or engraved portion. The vessel should then be filled with a very dilute solution of permanganate of potash. After such treatment, a photograph showing a clear impression of the etching or engraving may readily be obtained.—*Photography*.

Mounting Gelatin Prints.

It is pointed out that paraffined paper is good for rubbing down the prints when mounting, or gutta-percha tissue may be used for the same purpose. The film wants hardening; if this is secured by the use of alum the mounting may be more safely conducted. Some persons advise that the mountant should be spread on the card, and not on the print. It is well to use a clean squeegee over the print, and wipe it dry and clean every time it is passed over the face of the print. When washed place the print face downwards on a sheet of glass, one on top of the other; then drain. The top print is then brushed over the back with strong starch paste, not quite cold. The print is then lifted and placed loosely in its proper place on the mount. Another print is similarly treated, and when that is in position the first print is finally smoothed down on the mount with a fine soft sponge, well damped with water. This washes the superfluous paste off the edges at the same time. The sponge is then squeezed dry, and the print is wiped dry with it. Blotting-paper should never be used. Prints so mounted look clean, and never come off if the paste is of the right consistency.—*Photography*.

Photographic Contrivances.

J. A. White says he once chanced to place a common eye-glass lens in front of the diaphragm of a single combination lens, and expected to be surprised at the distortion of the picture. The resulting image was, of course, less in size, but he could discover no other difference in the two images. An interior made with that combination of an achromatic landscape lens of eleven inch focus and an eye-glass lens of seventeen inch focus showed no curved lines, and the title on a sheet of music taken at a distance of fifteen feet showed up clear and distinct; nor could he distinguish any diffraction of colours. It is best, he states, to have a set of multiple foci lenses, but with the aid of a pasteboard tube (made by rolling up a sheet of paper), his original achromatic lens, a positive spectacle lens of sixteen inches and a negative lens (for near-sightness), he has lenses of seven, eleven, fourteen, and twenty inches. Usually the original lens is preferable, but there is many a time when trying to compose a view on a small plate that the seven inch lens, covering a half size plate, comes in handy, or when a distant view loses all detail with the usual lens, the "twenty inch" is very convenient. A front extension is needed for the camera with the "twenty inch," but is easily made of pasteboard. The achromatic piece is used in the front of the lens with the others behind, and the mounting is easily done. Another contrivance is for taking stereoscopic views with one lens. A front board is fitted with one hole for a lens, the centre of the hole to be 1½ inch to one side of the centre of the board and equidistant from top to bottom. In use the lens is in position to command one of the halves. After exposing that half of the plate the slide is replaced in the holder, and the front board is reversed in order to expose the other part of the plate. The camera must be clamped rigid that the plate may not be displaced between exposures.—*Photographic Times*.

Photo-engraving with Silver Salts.

At the last meeting of the Royal Photographic Society, Mr. Leon Warnerke gave a demonstration of a process for photo-etching, partly dependent on sensitive silver salts instead of bichromated gelatin. A negative of the original is taken in the usual way through a screen. After the negative is developed and dried, it is given a safe edge. The next step in the process is to place the negative in contact with a sheet of paper coated with gelatin pigmented with a sensitive silver salt, such as the bromide, and making an exposure, the image being developed with pyro-ammonia. After development, the image is pressed or squeezed in contact with a copper plate previously polished with snakestone and charcoal, the paper backing and the soluble gelatin, together with the unaltered silver salt, being removed by hot water in the same manner as a carbon image is developed. After washing and treatment with alcohol, the plate, when dried, is ready for etching with perchloride of iron in the ordinary way. The process, Mr. Warnerke pointed out, might be adapted to photogravure purposes by commencing with a transparency instead of a negative, and transferring the developed negative in the plate grained with asphaltum, the subsequent operations being as usual. The process is an outcome of the negative paper process brought out by Mr. Warnerke in 1860, and described by him in the paper he read before the Society in 1886.—*Journal of the Society of Arts*.

Developers for Bromide Papers.

Hesekiel and Co. recommend the following developer for their "grain" bromide paper (see Supplement, p. 14):—

- Solution I. Potassium oxalate, 8 oz.; water, 10 oz.
 II. Iron sulphate, 3 oz.; water, 10 oz.
 III. Potassium bromide, 1 oz.; water, 10 oz.

For use mix six parts (p. oz.) of I. with one part of II., add a few drops of III. to obtain extra brilliancy, and then water, 5 oz. After developing, put the prints in a clearing solution (acetic acid, 1 dr.; water, 83 oz.), rinse and fix (hypo., 4 oz.; water, 20 oz.). Another good developer is a 1 per cent. solution of rodinal, with a few drops of potassium bromide solution as required. After developing, rinse and fix in hypo. solution as above, treating for ten minutes.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, JANUARY 19.

Pharmaceutical Football Club v. Clissold, at East Finchley. Commence at 8 o'clock. Train from King's Cross at 2.18. p.m.

MONDAY, JANUARY 21.

Society of Arts, at 8 p.m.
 "The Arc Light" (Second Lecture), by Professor Silvanus P. Thompson.
Victoria Institute, at 4.30 p.m.
 "The Botany of Australasia, Fossil and Contemporary," by the Rev. W. Woolls.
London Institution, at 5 p.m.
 "Comets" (Illustrated), by Professor Sir Robert S. Ball.
Imperial Institute.
 House Dinner, at 6.45 p.m.
 "Experiences and Prospects of African Exploration" (Illustrated), by J. Walter Gregory, at 8.30 p.m.

TUESDAY, JANUARY 22.

Royal Institution of Great Britain, at 3 p.m.
 "The Internal Framework of Plants and Animals," (Second Lecture), by Professor C. Stewart.
Society of Arts (Foreign and Colonial Section), at 8 p.m.
 "The Resources and Trade of Armenia and the Caucasus," by Dr. A. Markoff.
Royal Geographical Society, at 4 p.m.
 "Terrestrial Magnetism," by Professor A. W. Rücker.
Royal Photographic Society, at 8 p.m.
 "Control over Results in Development," by Alfred Watkins.
Central London Throat, Nose, and Ear Hospital, at 4.30 p.m.
 "The Treatment of Diseases causing Deafness, without Pain or Discharge," by Dr. Dundas Grant.
Aberdeen Chemists' and Druggists' Assistants' and Apprentices' Association, at 9.30 p.m.
 "A Run through a Paper Mill," by W. Clegg.

WEDNESDAY, JANUARY 23.

Imperial Institute.
 Concert Dinner, at 6.30 p.m.
 Ladies' Concert, at 8.30 p.m.
Society of Arts, at 8 p.m.
 "Tea," by A. G. Stanton.
Western Chemists' Association (of London), at 9 p.m.
 Smoking Concert at the Westbourne Restaurant, 1, Craven Road, W.
Manchester Pharmaceutical Association.
 Special Meeting. Address by the President of the Pharmaceutical Society (Mr. M. Carteighe) in the afternoon.
Manchester Pharmacy Ball at the Hulme Town Hall, Manchester, at 7.30 p.m.
Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.
 Debate.
Geological Society.
 "Carrook Fell: a Study in the Variation of Igneous Rock-masses. Part II. The Carrook Fell Granophyre. Part III. The Grainsgill Gneiss," by Alfred Harker.
 "The Geology of the Country around Fishguard (Pembrokeshire)," by F. R. Cowper Reed.
 "On the Mean Radial Variation of the Globe," by J. Logan Lobley.

THURSDAY, JANUARY 24.

Imperial Institute, at 4.30 p.m.
 "The Pastures of the Sea" (Illustrated with Lantern Slides), by George Murray.
London Institution, at 6 p.m.
 "Utopias: Ancient and Modern," by the Rev. Professor Shuttleworth.

Royal Institution of Great Britain, at 3 p.m.
 "Four English Humourists of the Nineteenth Century" (Second Lecture), by W. S. Lilly.
Chemists' Assistants' Association, at 8.30 p.m.
 "Volumetric and Colorimetric Analysis," by Dr. W. H. Symons.
Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.
 "Notes on Recent Materia Medica," by J. Rutherford Hill.
Liverpool Pharmaceutical Students' Society, at 8.30 p.m.
 "Electro-Therapeutics," by F. Chas. Larkin.
 "Demonstration of Apparatus," by F. C. Larkins and J. Bark.
Edinburgh Chemists' Ball, at the Freemasons' Hall, George Street, at 9 p.m.

FRIDAY, JANUARY 25.

Royal Institution of Great Britain, at 9 p.m.
 "The Nile," by Sir Colin Scott-Moncrieff.
Sheffield Microscopical Society, at 8.30 p.m.
 "Section Cutting and Staining," by C. O. Morrison.

SATURDAY, JANUARY 26.

Royal Institution of Great Britain, at 3 p.m.
 "Stained Glass Windows and Painted Glass" (Second Lecture), by Lewis F. Day.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal* (Patents). Where complete Specification accompanies Application, an asterisk is suffixed.

No. 22,973.—Charles Stephen Wheatley Brown, 3, Elcomb Villas, Hertford Road, Edmonton, London.—Improvements in, and relating to, storage batteries. November 27, 1894.
 No. 22,985.—Ernest Oldenbourg, 11, Warwick Street, Regent Street, London.—Improvement in the means of fastening to incandescent, electric, or other lamps and globes any shade or ray diffuser. November 27, 1894.
 No. 22,986.—Charles Jones Hubbell, 46, Lincoln's Inn Fields, London.—Improvements in, and relating to, primary batteries for producing portable electricity for light and power and other purposes.* November 27, 1894.
 No. 22,992.—Eduard Lent, 115, Cannon Street, London.—New or improved spirit burner for heating purposes. November 27, 1894.
 No. 22,996.—Julien Bouhon, Hamburg.—An inextinguishable reservoir for petroleum or other inflammable liquids. November 27, 1894.
 No. 23,022.—Per Erik Fahlberg, 45, Southampton Buildings, Chancery Lane, London.—Improvements in apparatus for producing a sleep-giving or appeasing sound.* November 27, 1894.
 No. 23,031.—Herbert John Haddan, 18, Buckingham Street, Strand, London.—Improvements in apparatus for carbonating liquids. (*The Ferry Manufacturing Company, United States.*)* November 27, 1894.
 No. 23,032.—Herbert John Haddan, 18, Buckingham Street, Strand, London.—Improvements in the method of, and means for, carbonating liquids. (*The Ferry Manufacturing Company, United States.*) November 27, 1894.
 No. 23,067.—William Jones, 15, Water Street, Liverpool.—Label holder. November 23, 1894.
 No. 23,068.—Henry William Searle.—15, Water Street, Liverpool.—Improvements in, or connected with, the printing and developing of photographs. November 23, 1894.
 No. 23,101.—Achille Auguste Bécheras, 23, Southampton Buildings, Chancery Lane, London.—A new or improved composition or preparation for the destruction of insects. November 23, 1894.
 No. 23,111.—Valentine Blanchard, Harston, Cambs.—An improved method of carbon or pigment printing without transfer. November 23, 1894.

Notes.

NEW POST CARDS.—Post cards of the "Court" or "Correspondence" size, bearing halfpenny impressed stamps, are now on sale at all post-offices. These cards will be sold at the same price as the present stout post-cards.

MEDICAL HONOURS IN AUSTRIA.—Among the twenty-four new life members of the Austrian Upper House gazetted last week, are Professor Albert, surgeon, and Baron Widerhofer, physician.

NEW SCIENTIFIC SERIES.—The first volume of a new scientific series, to be named the Cambridge Natural History, will be issued shortly by Messrs. Macmillan and Co. For this volume articles have been written by the Rev. A. H. Cooke, of King's College, Cambridge; Mr. A. E. Shipley, of Christ's; and Mr. F. R. Reed, of Trinity College.

THE ARTIFICIAL SPECTRUM TOP.—A remarkable and most interesting discovery has recently been made by Mr. C. E. Benham, of Colchester, who noted that a special design printed in black ink on a white card gives, when rotated in a bright light, brilliant bands of colour—red, buff, green, blue, etc. When rotated in the opposite direction the positions of the colours are reversed. This design has been arranged in the form of a small top, which can be obtained of Messrs. Newton and Co., Fleet Street, London.

INDIGENOUS DRUGS OF INDIA.—Orders are now being received by Messrs. Thacker, Spink, and Co., of Calcutta, for a new edition of the work on 'The Indigenous Drugs of India,' by Rai Bahadur Kanny Loll Dey, C.I.E., late Professor of Chemistry and Chemical Examiner to the Indian Government. It will contain descriptions of over five hundred of the more important medicinal products indigenous to India, with copious indexes of scientific, English, and vernacular names.

A DIPHTHERIA CHART.—A useful chart, specially arranged for recording clinical facts observed in the serum treatment of diphtheria, is printed by Messrs. Adlard and Son, Bartholomew Close, London. It has been drafted by Dr. Jobson Horne, late House Physician at St. Bartholomew's Hospital, with a view to obtaining careful and complete records of important clinical observations, as well as uniformity in keeping records.

NATURAL HISTORY OF PLANTS.—In the ninth part of Kerner and Oliver's 'Natural History of Plants,' just issued by Messrs. Blackie and Son, the protection and dispersion of pollen, and the colours and scents of flowers as attractive agencies are dealt with at length in the authors' usual attractive style.

STERILISED MILK IN NEW YORK.—Dr. Nathan Straus shows, in the *Forum*, that the death-rate of New York has been lowered by the establishment of proper precautions for the sale of milk, success being greatest when sterilised milk has been sold.

CHLOROFORM AS AN ANÆSTHETIC.—Dr. C. F. Marshall, late anæsthetist to the Hospital for Sick Children, Great Ormond Street, advocates a mixture of chloroform and ether, as being safer in use than chloroform by itself, and at the same time as effectual, and suggests that the use of chloroform by itself should be discontinued.

CHEMICAL SOCIETY GRANTS.—The grants made by the Chemical Society from its research fund during the past year include the following:—£20 to Mr. A. Hutchinson, for experiments on the reduction of benzenoid amides; £50 to Professor Perkin, for continuation of his researches on closed carbon chains; £5 to Messrs. Linder and Picton, for continuation of researches on grades of solution; £5 to Dr. Laycock, for further examination of the products of distillation of bran with lime; £10 to Dr. Matthews, for the continuation of his investigation of benzene hexachlorides and allied compounds; and £10 to Dr. Colman, for the study of α - and β -amido-fatty acids.

SALTERS' COMPANY RESEARCH FELLOWSHIP.—The Executive Committee of the City and Guilds of London Institute have awarded the first Salters' Company's Research Fellowship, for the encouragement of higher research in chemistry in its relation to manufactures, to Mr. Martin O. Foster, Ph.D., F.C.S.

COCAINE AS AN ANÆSTHETIC.—Cocaine, according to M. Maurel, of Toulouse, acts on the capillaries, causing contraction, so that thrombosis and embolism may easily be set up. In fatal accidents from the use of cocaine, pulmonary embolism, due to the paralysed white corpuscles forming plugs in the contracted capillaries of the lung, is the chief cause of death.

APPOINTMENTS AND ELECTION RESULTS.—Messrs. Allwood Simpson and Richard Needham, both chemists and druggists, of Stalybridge, Cheshire, have been appointed Justices of the Peace for that borough. Mr. N. H. Martin, pharmaceutical chemist, was elected a member of the Newcastle-upon-Tyne Board of Guardians last week, and the *Newcastle Daily Chronicle* remarks that in him science will have a much needed guardian. Mr. R. W. Giles, pharmaceutical chemist, is associated with Mr. R. A. Robinson on the Kensington Vestry. Mr. C. Goddard Clarke, a member of the firm of Messrs. Potter and Clarke, botanic druggists, Raven Row, Bishopsgate, has been appointed Justice of the Peace for the County of London.

ADULTERATION OF FOOD AND DRUGS.—Mr. R. A. Robinson has been elected Chairman of the Special Purposes Committee of the Kensington Vestry. Among other duties, this Committee is charged with the carrying out of the Sale of Food and Drugs Act, and, the Vestry having applied to give evidence before the Select Committee of the House of Commons on the proposed amendment of the Act, it is very probable that Mr. Robinson, as Chairman of the Committee, may be called to give evidence thereon.

COPPER IN PEAS.—An interesting case, under the Sale of Food and Drugs Act, was heard at Bristol on Friday, January 11, when a grocer was charged with selling a bottle of pickled green peas, containing 0.205 grain of copper, equivalent to 0.82 grain of copper sulphate. It was understood that this was a test case, and after evidence regarding the presence of copper had been given, the case was adjourned until Friday, January 25.

MANCHESTER PHARMACY BALL.—The second annual ball, held on Wednesday night in the Hulme Town Hall, Manchester, was not in any sense behind last year's, and the committee of management is again to be congratulated on having scored a big success. The hall was beautifully decorated, and the company numbered 220. Among the guests were Mr. and Mrs. Michael Cartelgho, London; Mr. R. S. Gibbs, Birmingham; Mr. J. Smith, Liverpool; Professor Young, Owen's College; and a goodly number of local medical friends. Mr. E. S. Johnstone efficiently performed the duties of M.C., and dancing was kept up with vigour till 2 a.m. During the night a short concert was sandwiched in, and songs were admirably rendered by Misses Stanley, Burgess, and Nelly Leeson, and Messrs. Cuthbert, Allan, and J. H. Franklin.

Legal and other News.

PRESCRIBING BY A CHEMIST.—At the St. Pancras Coroner's Court, on January 22, Dr. G. Danford Thomas held an inquest with reference to the death of James Jeffries, aged 58, hairdresser, lately residing at Chester Road, Highgate. The deceased had complained of severe internal pains, and his daughter-in-law went to a chemist's and brought back an 8-oz. bottle labelled "The mixture. One tablespoonful to be taken every hour if needful. J. Johnstone, of 218, Kentish Town Road, and Southampton Street, Camberwell." He had one dose at once, and seemed to be somewhat relieved, but at three o'clock in the morning, when the pains came on again, he had another tablespoonful, and died shortly afterwards. Dr. Sanctuary, of 228, Kentish Town Road, stated as the result of a *post mortem* examination that there was a huge aneurism of the aorta, larger than the 8-oz. medicine bottle produced, and this had pressed upon the trachea and caused death by asphyxia. The Coroner asked the doctor whether the medicine the man had taken had had anything to do with the death, and the witness replied that he could not say, but that no doctor would have prescribed such a mixture for a case where the patient was suffering from disease of the heart and kidneys as the deceased was. Mr. Johnstone, the chemist, informed the Coroner that the mixture contained a small quantity of chlorodyne and sal volatile. He added that he would not have given the medicine if the facts of the case had been correctly described to him.—The Coroner: But you know that you have offended against your own Pharmacy Act, and you gave your mixture for administration to a person you knew nothing about?—The Chemist: It is a difficult thing to be a chemist at the present day. All chemists ought to be doctors, it seems to me. You have to say how people are to take their breakfasts, dinners, teas, and suppers, and how to use every halfpennyworth of stuff you sell. The Coroner.—But you know that by prescribing poisons you are committing an illegal act, for which you can be punished, and it is my duty to tell you so. I know your difficulties, and no doubt you think it hard that when a person comes to

you late at night you are not allowed to serve him, but I must tell you that you run a great risk if you prescribe poisons. The Chemist.—I do not prescribe for people as a rule, and it is impossible for a chemist to say whether a person is suffering from heart disease. The Coroner.—But chemists must not act in the dark. You know it is beyond the province of a chemist to prescribe poisons. The Chemist.—The medical men should not do their own dispensing. It seems an anomaly, because the Government allows me to sell as much chlorodyne as I like, provided the bottle bears a stamp. In reply to a juror, Dr. Sanctuary said he had no doubt that the man must have died from the aneurism, which had even grown one of the ribs. The Coroner (to the chemist).—You know there is not any absolute necessity for you to supply these drugs when people come to you. Why not give them something that is not poisonous? Chlorodyne, you know, contains morphine, prussic acid, ether, Indian hemp, and chloroform, which form a very dangerous compound. The Chemist: But I have taken it myself. The Coroner: Every constitution is not the same, and you must be very cautious in fact, as your mixture might have caused this man's death. The jury eventually returned a verdict of "Death from asphyxia caused naturally," and the Coroner again warned the chemist to be more cautious in future.—*Times*.

NEWCASTLE AND THE SWEDISH EDUCATION.—In the course of an address delivered by Dr. Kitchin the recently appointed Dean of Durham, on the occasion of the prize distribution at Rutherford College, Newcastle-upon-Tyne, on January 16, and reported in the *Newcastle Daily Chronicle*, the speaker said that now they stood at the opening of a new period in the history of education in England. He thought, himself, that Newcastle had in it something not a little, of the quality which he had himself watched as characteristic of the Swedish education. They were so near Sweden there, and had so many Scandinavians in their streets, that perhaps they had caught a little of their fire of education. He now went into any part of the world where education was so magnificently conducted or with so much disregard of the pounds, shillings, and pence view, and so much regard to the ultimate success, as in Sweden. Take one branch of their education, which he saw they were just introducing here—that which was technically called the education in Sloyd. What a splendid thing that was the people of England could not realize. What it was really was this: it was an attempt to train the eye and the hand, and, behind them, the intelligence of all the students in the simplest way, by cutting out little figures in wood. It might be imagined that this was a mere play and triviality. One went into a Sloyd school, and the man who had the charge of it said: "Here is a knife, and here is a bit of wood, and here is a model." The first model, perhaps, was a little bit of a ruler, six or eight inches long, and half-an-inch thick. The student had to cut his bit of wood without measurements, without being able at any time to see whether it was right or wrong, except by his eye, and he had to do that as near the original as he could. The result of that was that, after a few months' training in this particular kind of work the young men could work the most elaborate and exact copies of things put before them, not differing by the hundredth part of an inch, as it were, from the original which they had to copy, of the same texture, with the same gradual growth, the swelling out or reducing of the circle or the sides of the figure they had to draw, until at last a man's eye and hand became so thoroughly trained that he could see in a room or in a building every single point that was not quite straight or not quite true. He was thus made, by the training of a few months, a far more efficient human being than he

would have been without it. The object of the Sloyd system was really to teach people to do the right thing in the right way. If we could get our education here to do the same thing—to open people's eyes to see and to open the hearts to take in the great thoughts that the world could produce for them—we should do a great deal to train them to be capable men, fit to be the citizens of a country the interests of which were the largest the world had ever seen, and the responsibilities of which were so enormous that no man could think of them without a certain fear in his heart.

Reference was made to this address by a pharmaceutical candidate for School Board honours at Newcastle, at an election meeting on the following night, when Mr. N. H. Martin observed that Dean Kitchin said that the Sloyd system made a man a more efficient human being than he would be without it, but asked where was the evidence that the Swede was a far more efficient human being than the Briton? How long had the Sloyd system been in existence in Sweden? If it was of recent growth, let Sweden go on with the experiment, and they would watch her. If it had been in operation 20, or 50, or 100 years, why was Sweden not the greatest power to-day, instead of Great Britain? It was all very pretty, and for a Dean on his holiday very idyllic. Toys made by the Swedes in the winter were hawked in the streets of Newcastle. If that was to be the result of our education, he for one would go to another country for his education. The Dean praised Sweden for disregarding pounds, shillings, and pence. He had always understood that Sweden was a poor country. Was their poverty the result of this disregard?

SALE OF INDECENT PHOTOGRAPHS.—At the County of London Sessions, on January 22, before Sir P. H. Edlin, Q.C. (chairman), Howard Hogben,* 39, described as a chemist, pleaded guilty to having unlawfully sold to one McGowan certain improper photographs at No. 5, Railway Approach, Charing Cross. Mr. Elliott prosecuted, and the prisoner was represented by Mr. H. H. Lawless. Mr. Lawless said that the shop at Railway Approach was sold to a Mr. Mitchell about a year ago. Hogben was in the service of the previous proprietor prior to being employed by Mr. Mitchell. The prisoner had borne an excellent character, and sold the articles without the slightest knowledge on the part of Mr. Mitchell. Sir P. H. Edlin sentenced Hogben to twenty-one months' imprisonment with hard labour, and ordered the articles found to be destroyed. The proprietor of the chemist's shop, Mr. Mitchell, was exonerated from all blame by the Court.—*Daily News*.

PHARMACEUTICAL FOOTBALL CLUB.—A match was played between the Pharmaceutical and Clissold Football Clubs, on the ground of the latter at East Finchley, on Saturday. It had been looked forward to with general interest, as Clissold is one of the strongest clubs the Pharmaceuticals meet this season. The list of players arranged to meet their team was moreover encouraging. G. W. Allen was fortunately able to play, and took up his usual place as right back, while Woodruffe filled the usual place of the vice-captain, Lilly, as left back, the latter being prevented from attending. P. R. Allen instead of going forward as usual, took up his position as centre half-back, a place which suits him no less as player than as captain. Conspicuous among the forwards were Robinson and F. Sturton, the latter coming out or the first time this season, but Wand was conspicuous by his absence. Now that he has left London he will be much missed, especially as Bateson, the only one who could equally fill his place

as goal, is under orders not to play. Clissold won the toss and elected to play down the slope, which soon showed its effect on the visiting team. After about five minutes, Clissold from a throw-in sent the ball between the posts, but the throw-in was ruled a foul, and no goal was allowed. Soon the Pharmaceuticals pressed and a shot from Robinson was doubtfully saved, the ball coming off the goal as he stood behind or on the line. At half-time Clissold led by one goal to nil. On resuming play the Pharmaceutical men had much the best of the game, pressing their opponents repeatedly, but as they were playing short of a man, and had no one at centre-forward, several opportunities to score were lost. A goal was obtained, however, by Sturton, who was in the act of adding a second when the whistle blew for time, a moment too soon, the game thus ending in a draw.

DEATH FROM ANTHRAX.—A coroner's jury at St. Helen's, on January 21, found that Isaac Biddulph, an employé at a local manure factory, died from anthrax, the microbes of which were absorbed into his system from the bones of cattle used in the preparation of manure. It was stated that there had been other similar cases in the works, and the Government inspector undertook to report the matter to the Home Office with a view to making special rules for the regulation of manure factories.—*Standard*.

GAS AND ACETYLENE.—Professor Vivian B. Lewes of the Royal Naval College, Greenwich, read a paper at the Society of Arts, on January 16, on the possibility of making high value illuminating gas without the use of coal, oil, or other organic material. Of late years, he said, an idea had been slowly permeating the minds of some gas managers in this country that it might be well to adopt a dual gas supply, one for fuel purposes, which would consist of a poor coal gas of about twelve candles, whilst the gas for illuminating purposes would be of about twenty candles; and in one town, at least, it had been proposed, and, he believed, carried out, that a supply of poor quality coal gas should be sent out during the day, when the maximum consumption is for heating purposes, and a richer gas at night for illuminating purposes, utilising the same mains for both. Although this was possible in a small town, where the area to be supplied was not large, it would be impossible in a big town where many miles of huge mains had to be travelled before certain districts are reached, and the cost of a double set of mains would render a dual supply an impossibility. The use of acetylene, which he described as a clear, colourless gas, would, he said, render it possible for the gas company to send out a 12-candle gas for heating purposes, both by night and day, whilst a small enrichment cylinder might be attached to the gas outlet pipes from the consumer's meter, and which would be made to automatically enrich the gas supplied to his house, so that by setting a valve he could have any quality he might desire. The economic value of an illuminant such as acetylene became apparent, when they compared the cost of the gas for equal illumination with the light obtained from other illuminants. The London gas had an illuminating power of 16 candles, while the acetylene had an illuminating value of 240 candles, and this, at 6s. 9½d. per 1000, would in light-giving value be equivalent to London coal-gas at less than 6d. per 1000. In order to obtain a given illumination, moreover, the volume of gas to be consumed was excessively small, as compared with any other illuminating gas, and the products of combustion were reduced to an excessively low limit. One hundred cubic feet of London coal gas would yield 50 cubic feet of carbon

* This name does not appear on the Register of Chemists and Druggists for 1895

dioxide, and 140 cubic feet of water vapour, as the products of its complete combustion, whilst 100 cubic feet of acetylene would yield 200 feet of carbon dioxide and 100 feet of water vapour. The acetylene, however, in its combustion, gave a light of 240 candles, as against 16 yielded by the coal gas; and for equal illumination, therefore, the amount of carbon dioxide and water vapour produced was enormously smaller. The intensity of the light would make small acetylene lamps of enormous value for lantern projection, for railway signals and bicycle lamps, whilst the ease of production specially adapted it for such purposes as lighthouse illumination.—*Standard*.

SALE OF FOOD AND DRUGS ACT.—At the annual meeting of the Society of Public Analysts, held on January 16, at Burlington House, the valedictory address of the retiring President, Sir Charles A. Cameron, M.D., expressed the hope that the labours of the Select Parliamentary Committee which sat last year, and was about to be re-appointed, would result in recommendations leading to more stringent enactments for the regulation of the sale of articles of food and drink. A great deal of the evidence laid before the Committee during the last session had emanated from witnesses more or less closely connected with the vending of such articles as the Sale of Food and Drugs Act dealt with, and it was therefore not surprising that the evidence so far had not been wholly in favour of increased stringency in the suppression of adulteration. He hoped, however, that the evidence which the public analysts—who had yet to be heard—would lay before the Committee would convince them that to relax the provisions of the present rather weak Acts would not be to the advantage of the public at large. The Council of the Society of Public Analysts had drawn up its recommendations in the form of a draft Bill, which had been the outcome of long and careful deliberation and consideration, and he trusted that the outcome of the Parliamentary Committee's deliberations would be the adoption of a Bill substantially similar to that submitted to them by the Society. Some legal provision for the laying down of authoritative standards was, in his opinion, highly important. Legal standards were at present almost completely non-existent, a fact often taken advantage of by counsel and solicitors engaged in defending cases of undoubted sophistication. The working of any fresh Act would be very greatly facilitated by the provision of officially recognised data as to the proper composition of the various articles of food. The question of water in butter was referred to at some length, the President expressing his unaltered conviction that no properly made butter need contain more than 16 per cent. of water. The percentage of water in Irish butter, which until recently was very often high, had steadily declined in the face of the persistent conduct of the authorities in prosecuting the vendors of samples containing an excessive quantity. Within the last two years nearly 200 convictions had taken place in Ireland on his certificates alone, the greater proportion of these cases having occurred in the province of Munster. It was perfectly easy to make butter so that it should contain at the outside not more than 16 per cent. of water, and carelessness or want of skill on the part of the maker should not be allowed to inflict wrong on the consumer.—The address on account of the detention of the President in Dublin, where the continued prevalence of small-pox kept him at his duties as medical officer, was read by Dr. Bernard Dyer, hon. secretary to the Society.—Dr. T. Stevenson, F.R.C.P., the official analyst to the Home Office, was elected president of the Society for the ensuing year.—*Daily News*.

THE MATTEI REMEDIES.—At the Workop County

Court, on Tuesday, January 15, before His Honour Judge Masterman, a case was brought forward that had been previously adjourned. At the previous court a lady named Blakeley, who lives at "The Mattei Depot," Newcastle Avenue, Workop, sued a number of Workop and district residents for sums of money which she alleged were due to her for medicines supplied. At the hearing of the case it appeared that the plaintiff had represented herself as a doctor, and had dispensed the Mattei remedies. A young lady named Nelly Pinder, who appeared for the plaintiff, said the prescriptions were made up by herself, as they did not, according to her belief, contain poison. His Honour then adjourned the case in order to have the medicine analysed, and commenting on the fact that unlicensed persons were allowed to dispense things of this sort, he said that if allowed by law it was a source of danger to the public at large. At the first hearing several of the people who were sued alleged that the whole thing was a fraud. The plaintiff was now represented by Mr. A. Charles, of Retford, who stated that the whole of the cases entered into at the previous court were now withdrawn, and one of the defendants from Cucknall-Lindrick asked for costs, and this Mr. Charles opposed on the ground that notice had been given the defendant, who need not have come, and his Honour said it was very likely he should not allow costs for the day, but whether he ought to have the costs of the previous attendance he would decide later.—Mr. Charles said his client, being a woman, was ignorant of the mode of procedure and also of the law when she brought the action, but she had since been advised, and it was seen that she was wrong. His Honour said from the analysis made by the county analyst, the contents of the bottles handed to him at the previous court consisted only of tap water, and if that had been given in evidence before him he should certainly not have found for the plaintiff. Mr. Charles again said that his client had no cause for action. His Honour said plaintiff must pay for going outside the law. He allowed the defendants who appeared the costs for attending the previous Court. His Honour further remarked that the county analyst failed to find anything in the bottles except tap water, and was also satisfied that there was no appreciable medicinal active ingredient. He further said that it should be remembered that it was not proved before him that the liquid in the bottle really was the medicine dispensed. It was simply handed to him by one of the defendants.—*Nottingham Guardian*.

ACTION AGAINST A MEDICAL PRACTITIONER.—In the Sheriff Court of Renfrew and Bots of Greenock, on Thursday, January 24, Sheriff Henderson Begg on the Bench, an action for libel was heard at the instance of John Cairns, druggist's assistant, residing at 39, Bank Street, Greenock, pursuer, against William Cairns, medical practitioner, residing at 19, Ardgowan Square, Greenock, defender. Agent for the pursuer, Messrs. Fyfe and Murray, writers; agent for the defender, Mr. John Cameron, solicitor. Mr. P. Morrison, S.S.C., Edinburgh, watched the case on behalf of the Pharmaceutical Society of Great Britain. The pursuer claimed £500 damages and expenses for alleged libel.

From the averments of the pursuer it appeared that the libel consisted of statements made by Dr. Cairns to the effect that the pursuer did not pass the Preliminary examination of the Pharmaceutical Society of Great Britain, but had, as a matter of fact, conspired with a Francis Lambie, of Greenock, who passed the examination in his stead.

The pleas of the pursuer were:—

1. The defender having maliciously defamed the

character of the pursuer to his loss and injury, the pursuer was entitled to reparation.

2. The statements complained of having been uttered by the defender, and intended and understood to bear the actionable meaning put upon them by the pursuer, the latter was entitled to reparation from the defender.

3. The statements complained of by the pursuer being false and calumnious, he was entitled to solatium and damages.

The pleas for defender were:—

1. The action was irrelevant.

2. The defender, not having slandered the pursuer, was entitled to absolvitor.

3. *Veritas*.

4. The damages claimed were excessive.

5. The defender should be found entitled to expenses.

The case was not finished at the time of going to press, but a complete report will be published next week.

"AN UNLIMITED SHAM."—At Shoreditch County Court on Tuesday, before Judge French, William Jeans, manager of the London and Great Western Drug Company (Limited), was sued by Orrica and Co., wholesale chemists, for goods supplied. Mr. Moore, who appeared for defendant, admitted that the money was owing, but said that the limited company was the debtor and not defendant. Defendant, in answer to his Honour, stated that the business was formerly his own. He sold it to the company some months ago. Judge French: How many shareholders are there? Defendant: Nine. Judge French: What is the capital? Defendant: £650. Judge French: Did the company pay you any money for the business? Defendant: No, I was paid 500 fully paid-up shares. Judge French: This is one of the greatest shams I have ever come across. The limited company is an unlimited sham. I find, as a matter of fact, that the defendant is the company. Every small tradesman in the country could find an easy exit from bankruptcy if this sort of thing were allowed. Judgment for the plaintiffs, with costs.—*Times*.

Food and Drugs Act Prosecution.

At South Shields on January 18, before Alderman Eltringham, Alderman Imrie, and Dr. Crisp, Mason and Co., Limited, chemists, were summoned for having sold three ounces of precipitated sulphur not of the nature and substance demanded. The town clerk (Mr. J. M. Hayton) was for the prosecution and Mr. O. W. Newlands defended. Michael Pollock, inspector under the Food and Drugs Act, stated that on December 17 he sent his assistant into the defendants' shop in Green Street for three ounces of precipitated sulphur, which was contained in a packet. He took it back to the shop, divided it into three parts, one of which he sent to the public analyst, who had since certified that it contained 63 per cent. of hydrated sulphate of lime. By Mr. Newlands: The label on the packet was marked "milk of sulphur." Dr. Turnbull, medical officer, said that precipitated sulphur should be pure sulphur and free from the foreign ingredients, therefore free from sulphate of lime. Mr. Newlands contended on a technicality that the proceedings should have been against the actual seller of the article, not the company. He also asked the Court to say that the article supplied was milk of sulphur and not precipitated sulphur, and that the case must proceed on the ground of what was sold, and what the inspector knew he got. That being so, there was no evidence that it was not milk of sulphur that was sold, and the case, therefore, must fail. If necessary, he asked for an adjournment to prove that what was sold was pure "milk of sulphur" as the label on the packet described it.—The magistrates retired to consider their decision, and found the case proved. A fine of 20s. and costs was imposed.—*Shields Daily Gazette*.

Poisoning Cases and Inquests.

Belladonna.—William Howat, aged 53, died at Urmston on Monday, January 14, from the effects of belladonna poisoning. Verdict: "Death by misadventure."—*Manchester Courier*.

Spirit of Salt.—Louis Thomas, aged about 30, died in the Infirmary at Homerton on Thursday, January 17, from the effects of spirit of salt, self-administered.—*Star*.

Prussic Acid.—Albert Wallace Belfitt, aged 31, died on Friday, January 18, at Newbold Moor, near Chesterfield, from the effects of prussic acid, self-administered.—*Sheffield Independent*.

Narcotic Poisoning.—James Hamilton, aged 53, died on Saturday, January 5, at Wade's Temperance Hotel, South Road, Bishop Auckland, from the effects of a narcotic poison. Verdict: "Deceased died from an overdose of some kind of narcotic poison."—*Middlesboro Weekly Gazette*.

Strychnine.—Henry Clinton Davies, aged 38, died on Friday, January 18, at the Red House, Mare Street, Hackney, from the effects of strychnine, having taken by mistake four doses of medicine containing that poison. Verdict: "Accidental death."—*Standard*.

Vermin Powder.—Margaret Harriet Woods, aged 28, died on Monday, January 21, at Lancaster, from the effects of a vermin powder, self-administered. Verdict: "Suicide during temporary insanity."—*Manchester Courier*.

Morphine.—James John Sheean, aged 19 months, died on Thursday, January 10, at Abertillery, from the effects of medicine containing morphine, accidentally given to the child by its mother, who was under the impression it was cold tea. Verdict: "Accidental death."—*South Wales Daily News*.

Press Comments.

THE COMMUNICATION OF DISEASE BY OYSTERS.—We understand that the President of the Local Government Board has instituted an inquiry into the circumstances under which the cultivation and storage of oysters and other shellfish around our coasts are carried out. He has taken this step in view of information brought under his notice in a report which was recently submitted to him by Dr. Thorne Thorne, chief medical officer of the Board, on the subject of "Cholera in England during 1893," which report is now passing through the press and will be shortly issued. The medical inspector primarily charged with the inquiry is in communication with departments of Government concerned with the coastline and river estuaries, and with other authorities. The subject of the possible communication of disease as the result of the consumption of oysters in a raw state is no new one. It has often been suggested as the means by which typhoid fever has been conveyed, and instances have at times been cited in confirmation of this view. But until quite recently the matter has been found difficult of proof, because it is by no means easy to set aside all other causes of this disease, and because the chances of a given number of oysters containing the infection of typhoid fever are by no means great. On the other hand, it is known that oysters and other shellfish are often

cultivated and stored in proximity to sewer outfalls; and even where the dilution of the sewage with seawater is great the entanglement of particles of sewage in the beard and other parts of the oyster must obviously be well within the range of possibility. It now appears that Dr. Thorne Thorne, in studying the question of cholera in England during the year 1893, has felt it his duty to lay before the President of the Local Government Board certain views as to some relation between oysters and other shellfish on the one hand, and the diffusion of cholera on the other. His report cannot, apparently, be issued for some few weeks, but enough is known to show that it has become a matter of public importance to know precisely what are the conditions of risk or of danger that exist.—*Times*.

THE SALE OF POISONS.—Despite the law, poisons can be obtained with incredible facility. Strychnine pills are now sold by some chemists in fairly large quantities—at any rate, in quantities sufficient to kill many persons—although they are liable to a penalty for so doing; and consignments are sent over from the United States and Canada to private individuals, enclosed in letters and book packets. Carbolic acid, again, is a most deadly poison, but no restrictions whatever as to its sale are imposed. And what are the results? Simply this:—That dozens of deaths are recorded each year from accidental carbolic acid drinking.—*Echo*.

THE BELGIAN POISONING MYSTERY.—The great poison mystery now being unravelled at Antwerp draws attention to the fact that capital punishment is now practically a dead-letter in Belgium, owing to the persistent refusal of the King to sign a death-warrant under any circumstances. The erstwhile "cock-pit of Europe," however, manages to provide the world about every ten years with a *cause célèbre* of the first magnitude. The last criminal who perished on the scaffold in Belgium was the Count Visart de Bocarmé, a learned amateur chemist, tried at Mons in 1854 for poisoning his brother-in-law by nicotine. The case occasioned the greatest excitement, and many well-known French and English *littérateurs* were among those who spent a whole month in Brabant. Next came the Risk Allah murder-trial at Brussels in 1867, which eventually cost the *Daily Telegraph* several thousand pounds. More sensational than either was the Peltzer assassination case of 1881. The interest felt in its details were world-wide, and one of the convicts (both the prisoners were formally condemned to death) still survives in prison at Louvain. It is doubtful if either of these three trials could compare in importance with the Joniaux trial now proceeding. The accused is not only the wife of a high Government official, but is the daughter of General Ablay, a favourite aide-de-camp of Leopold I., and the sister of another distinguished soldier.—*News of the World*.

CORONER AND CHEMIST.—"It is a difficult thing to be a chemist," wailed Mr. Johnstone, of Kentish Town Road, when reminded by the coroner that he ought not to have prescribed a mixture containing poison. Seeing that the patient died from the effects of an enormous aneurism it probably mattered little whether he partook of Mr. Johnstone's chlorodyne and sal volatile or not. Still, it is illegal for a chemist to prescribe—though he may, as Mr. Johnstone pointed out, sell a pint of poison if he puts a stamp on it and sells it as a proprietary medicine. In spite of the obvious propriety of the law in that respect we agree with Mr. Johnstone that the lines of the modern druggist do not fall in pleasant places. What between the general practitioner who dispenses his own medi-

cines and the stores which undersell him the druggist has hard work to get any profit out of his drug. Wherefore he is excusably apt to assume a portentously professional expression of countenance when confronted with a customer who wants "something to pull me together" or "put me to rights," to accept the customer's account of his symptoms, and to dose him according to his lights. Ninety-nine times out of a hundred his treatment serves its purpose; but, of course, it does not allow for aortic aneurisms.—*Daily Graphic*.

PHOSPHORESCENCE AT LOW TEMPERATURES.—Before a large audience in the Royal Institution last night Professor Dewar described his continued investigations of the properties of matter at extremely low temperatures, and the experiments he made exhibited the phosphorescence which certain substances attained when, having been frozen to a temperature of -180° , they were exposed to a beam of light. Chemically, the lecture promised to classify bodies under a new system, the index to be the amount of phosphorescence which bodies were capable of emitting and of sustaining. Milk, for instance, is more highly phosphorescent than water, and the white of egg is much more phosphorescent than the yolk, and pure water than Thames water. The idea suggests itself that the luminosity of some of the heavenly bodies may be due to phosphorescence at extremely low temperatures. However this may be, there seems to be a decided probability of fresh light being thrown on the constitution of matter by the researches now being carried on in the former workshop of Faraday, and all interested in the progress of physical and chemical science will await further developments with interest.—*Pall Mall Gazette*. January 19, 1895.

* * The latter portion of the foregoing paragraph is of interest inasmuch as it appears to be taken bodily from the conclusion of the report of Professor Dewar's lecture before the Chemical Society, which appeared in the *Pharmaceutical Journal* for July 7, 1894. [Ed. *Pharm. Journ.*]

TEMPERANCE BEVERAGES.—Mr. A. W. Stokes, the public analyst for the parish of St. Matthew, Bethnal Green, mentions in his report to the Vestry that during the last quarter there had been submitted to him for analysis eight temperance beverages consisting of hop ale, non-alcoholic stout, lemonade, ginger beer, ginger stout, and ginger wine. Except the last, all of these were genuine, containing mere traces of alcohol, ranging from two-tenths to nine-tenths of one per cent. of proof spirits. But the sample of ginger wine, bought at a shop at which temperance beverages only were supposed to be sold, contained 10 per cent. of proof spirits. This is about twice the alcoholic strength of ordinary beer supplied at public-houses. The Sanitary Committee considered this a case for the Excise rather than for prosecution under the Food and Drugs Adulteration Act, hence no proceedings were taken.—*Standard*.

ADULTERATION AT BETHNAL GREEN.—Teetotallers in the parish of St. Matthew, Bethnal Green, will be grieved to hear that some of the ginger beer supplied to them as a temperance beverage contained 10 per cent. of proof spirits. This is about twice the alcoholic strength of ordinary beer provided in public-houses. Mr. Stokes, the analyst, reports that 12 per cent. of the temperance beverages sold in the parish are adulterated. The same gentleman makes a curious statement respecting baking powders. These compounds hold a peculiar position. It has been held by one of the higher law courts that baking powder is neither a drug nor a food, so that until it forms part of some bread the vendor cannot be prosecuted for using alum as one

of its constituents. Until further legislation takes place baking powder may be made up of almost any things that are not absolutely poisonous.—*Daily Telegraph*.

New Drug Companies Registered.

JAMES WOOLLEY, SONS AND CO., LTD.—Registered January 7, by George Trenan, 7, New Court, Carey Street, W.C., with a capital of £150,000, in £10 shares. Objects: To acquire and take over as a going concern the businesses of pharmaceutical chemists and wholesale and retail druggists, now carried on by George S. Woolley, Hermann Woolley, Charles A. Johnstone, and Edward J. Woolley, at 12, Victoria Bridge Street, Salford, and at Knowley Street, Cheetham, and Nos. 67 and 69, Market Street, Manchester, under the styles of "James Woolley, Sons and Co." and "James Woolley," and to carry on the business of chemists, druggists, dysalsters, oil and colourmen, importers, exporters, and manufacturers of and dealers in pharmaceutical, medicinal, chemical, industrial, and other preparations. Signatories:—

Shares.

George S. Woolley, 12, Victoria Bridge Street, Salford ..	1
Hermann Woolley, 12, Victoria Bridge Street, Salford ..	1
C. A. Johnstone, 12, Victoria Bridge Street, Salford	1
Edward J. Woolley, 12, Victoria Bridge Street, Salford ..	1
Edward S. Johnstone, 12, Victoria Bridge Street, Salford ..	1
Alfred E. Blair, 69, Market Street, Manchester	1
John H. Franklin, Knowley Street, Cheetham	1

There shall not be less than two nor more than five directors. The first are George S. Woolley, Hermann Woolley, Charles A. Johnstone, and Edward J. Woolley. Qualification, £1,000. Remuneration as may be fixed by agreement or by the company in general meeting. Registered office, 12, Victoria Bridge Street, Salford, Manchester. *Financial Times*.

WILLIAM HAY, LIMITED.—Registered by Jordan and Sons, 120, Chancery Lane, W.C., with a capital of £50,000 in £10 shares. Object, to acquire and take over as a going concern the business of a wholesale and retail chemist, aerated and mineral water, and soluble essence manufacturer, now carried on by William Hay at the borough of Kingston-upon-Hull under the style or firm of William Hay; with a view to such acquisition, to enter into and carry into effect an agreement which has already been prepared, and is expressed to be made between the said William Hay of the one part and the company of the other part, and to carry on the business of wholesale and retail chemists, wholesale and export druggists, manufacturers of and dealers in all kinds of aerated and mineral waters (natural and artificial), and every description of effervescing and non-effervescing liquors, beverages, and cordials, manufacturers of and dealers in all kinds of soluble and other essences, etc. The first signatories are:—

Shares.

W. Hay, manufacturing chemist, Holton House, Beverley Road, Hull	1
Mrs. Agnes E. Hay, Holton House, Beverley Road, Hull....	1
A. Egginton, banker, South Ella, Hull	1
W. J. Jackson, manager of chemical works, 4, Regent's Terrace, Anlaby Road, Hull	1
J. Pearson, commercial traveller, 73, Hamilton Road, Reading, Berks	1
W. P. Burkinshaw, chartered accountant, 2, Parliament Street, Hull	1
T. Holder, jun., solicitor, Union Bank Chambers, Hull	1

There shall not be less than three nor more than five directors. The first are William Hay (chairman), William J. Jackson, and Joseph Pearson. Qualification, £500. Remuneration as fixed by the company in general meeting. Registered office: 4, Regent's Terrace, Anlaby Road, Hull.—*Financial News*.

Publications received.

ZUR ANATOMIE DER ZWIEBEL VON CRINUM PRATENSE HERB. By G. LAGERHEIM. From the Author. **REARING AND FEEDING OF CHILDREN.** By THOMAS DUTTON, M.D. Pp. 198. Price 2s. London: Henry Kimpton, and Hirschfeld Bros.

Notes and Queries.

METHYLATED SPIRIT IN TINCTURES.

[798.] A. Ashby detects the presence of methylated spirit in tinctures, spirits, and other compounds, by mixing equal parts of a 1 p.c. solution of sodium nitroprusside and the suspected sample or its distillate, then adding a few drops of ammonia, and observing the colour of the mixture after standing for ten or fifteen minutes. If acetone or some other constituent of wood spirit be present in appreciable quantity, a fine red colour will be developed. The test is said to reveal the presence of 1 p.c. of acetone in rectified spirit, or, in the first 5 C.c. of a distillate from 25 C.c. 0.5 p.c., whilst in three successive 5 C.c. quantities of distillate tested and compared with each other, even 0.25 p.c. may be detected. Aconite, belladonna, soap, and compound camphor liniments, made with methylated spirit, all yielded the reaction. (*Analyst*).

SALUBRINE.

[799.] Under this fancy name a patent has been taken out for a medicament containing acetic acid, 2 parts; acetic ether, 25; alcohol, 50; and water, 23. Diluted with water (2-6 parts to 1 part of salubrine) it is recommended for antiseptic and hæmorrhagic purposes, for bruises, skin affections, rheumatism, etc. (*Med. Moderne and Répertoire*).

MICROSCOPE LAMP.

[800.] W. S. Baxter.—The Kochs-Wolz lamp, in which the light is refracted along a bent glass rod direct to the object, came from Germany. It was not considered a success by English workers with the microscope, although it is useful for low power work. C. Baker, 244, High Holborn, W.C., can supply it.

CRESYLIC ACID AND SERUM.

[801.] Charles Barnett.—You will find all the information you require concerning cresylic acid in 'Watts' Dictionary of Chemistry.' The preparation of serum from blood is described in the Journal for October 13 last. A. and M. Zimmermann, Cross Lane, St. Mary-at-Hill, E.C., can supply Arnson's antitoxin serum.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*.] Where complete Specification accompanies Application, an asterisk is suffixed.

No. 23,135.—Charles Thomas Gardner, St. James' Street, Brighton.—An improved sterilising, disinfecting, and deodorising fluid.*—November 29, 1894.

No. 23,244.—James Stothart Pearson and Ernest Lodge, Newsome, 6, Bank Street, Manchester.—Improvements in the distillation of water, and in apparatus therefor. November 30, 1894.

No. 23,280.—Frederick Sigismund Salberg, 333, High Holborn, London.—Improvements in, or relating to, apparatus for applying disinfectant to w.c.'s, dustbins and other places. November 30, 1894.

No. 23,330.—William Henderson Walker, 6, Lord Street, Liverpool.—Improvements in, or relating to, the treatment or manufacture of extracts of malted grain or the like. December 1, 1894.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, JANUARY 26.

Pharmaceutical Football Club v. Stormont, at Wormholt Farm, Shepherd's Bush, commencing at 8.15 p.m.

MONDAY, JANUARY 28.

Royal Geographical Society, at 9.30 p.m.

"Journeys in South-West Siam," by H. Warington Smyth.

Imperial Institute.

House Dinner, at 6.45 p.m.

"Egypt and the Nile" (Illustrated), by Lieut.-Col.

C. M. Watson, at 8.30 p.m.

London Institution, at 5 p.m.

"Native Life in India" (Illustrated), by R. W. Frazer.

Society of Arts, at 8 p.m.

"The Arc Light" (Third Lecture), by Professor Silvanus P. Thompson.

TUESDAY, JANUARY 29.

Royal Institution of Great Britain, at 8 p.m.

"The Internal Framework of Plants and Animals" (Third Lecture), by Professor C. Stewart.

Central London Throat, Nose, and Ear Hospital, at 4.30 p.m.

"The Antitoxin Treatment" (Fourth Lecture on Diphtheria, Illustrated), by Lennox Browne.

Royal Colonial Institute, at 8 p.m.

"South Africa," by Dr. F. Rutherford Harris.

WEDNESDAY, JANUARY 30.

Imperial Institute.

Concert Dinner, at 6.30 p.m.

Ladies' Concert, at 8.30 p.m.

Society of Arts, at 8 p.m.

"Peking," by Thomas Child.

University College (London) Chemical and Physical Society, at 5 p.m.

Ordinary Meeting.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.

Debate.

THURSDAY, JANUARY 31.

Royal Society, at 4.30 p.m.

"Argon," by Lord Rayleigh and Professor Ramsay.

Imperial Institute, at 4.30 p.m.

"India and Its Women," by S. E. J. Clarke.

Royal Institution of Great Britain, at 8 p.m.

"Four English Humourists of the Nineteenth Century" (Third Lecture), by W. S. Lilly.

London Institution, at 7 p.m.

"Franz Schubert" (Illustrated), by Professor Ernst Pauer.

Society of Arts (Indian Section), at 4.30 p.m.

"India and Its Women," by S. E. J. Clarke. To be read by Sir Alexander Wilson.

Chemists' Assistants' Association, at 8.30 p.m.

Short Papers by Members.

Plymouth, Devonport, Stonehouse and District Chemists' Association, at 8.30 p.m.

"Pharmacy Real and Ideal," by Mr. Hodge.

School of Pharmacy Students' Association, at 7 p.m.

Papers:—"Some Dartmoor Flowers," by D. P. Fuge.

FRIDAY, FEBRUARY 1.

Geologists' Association, at 8 p.m.

Annual General Meeting.

"The Geological History of the Himalayas," by the President (Lieut.-Gen. C. A. McMahon).

Royal Institution of Great Britain, at 8 p.m.

"Acting: An Art," by Henry Irving.

Quekett Microscopical Club, at 7 p.m.

Exhibition of Objects.

SATURDAY, FEBRUARY 2.

Royal Institution of Great Britain, at 8 p.m.

"Stained Glass Windows and Painted Glass" (Third Lecture), by Lewis F. Day.

Exchange.

[Notices of books, apparatus, etc., for exchange, or inserted free but must not exceed thirty words, including name and address, and will not be admitted if of the nature of an ordinary advertisement.]

WANTED.

DRUG MILL, capable of dealing with 14 to 28 lbs. of material.—White, Dispensary, St. Thomas's Hospital, S.W.

CAMERA, Lancaster's or other half-plate, long-extension, to take Lancaster's dark slides.—Greenish, 20, New Street, Dorset Square, W.

'PHARMACEUTICAL JOURNAL,'—April 15, 1893, and May 6, 1893. Full price will be paid for clean copies by the Secretary, 17, Bloomsbury Square, London, W.C.

DRIED PLANTS.—*Cephaelis ipecacuanha* (South America), with flowers and roots; *Pilocarpus* species (South America), with flowers and fruits; *Strophanthus* species (East Africa), with flowers and fruits.—Holmes, 17, Bloomsbury Square, W.C.

OFFERED.

HERBARIUM SPECIMENS of *Ferula narthex*, and East Indian and British medicinal plants.—Holmes, 17, Bloomsbury Square, W.C.

RAPHAEL'S OPSIOMETER, never used, cost 45s.; what cash offers? Also 1 dozen spectacles, cost 36s.; 2 dozen at 30s.; 5 dozen at 24s.; 4 dozen at 18s.—Rudd, Westgate, Ripon.

RECIPES, 130 well-tried, general, remedial, veterinary, toilet, and every-day preparations, neatly copied in book. Post free, 1s. 6d., or exchange patents or books.—Tully, chemist, Hastings.

FORTY-GALLON STEAM JACKETED PAN for sale, £10 nett. Jacket and pan all copper, tinned inside, and good as new.—Moss, chemist, Ilkeston.

TOMLIN'S RECEIPTS, 1s. 2d., new; 'How do I stand?' a complete bookkeeper, 8d., new; Muspratt's 'Chemistry,' 1860 edition, in good condition, 20s., complete.—Wills, 41, Dorset Street, Bolton.

CHEMIST AND DRUGGIST, 1883 to 1894 inclusive; 1s. 6d. per year or exchange.—Moody, 64, Cold Harbour Lane, S.E.

Trade Marks Applied For.

[Compiled from the Trade Marks Journal.]

183,919.—LAPCINE. A chemical preparation in the nature of a varnish.—Robert Ingham, Clark and Co., West Ham Abbey, Essex. November 27, 1894.

183,170.—THIOFORM. Medicines for human use.—Speyer and Grund, 18 and 20, Kaiserhofstrasse, Frankfurt-a-Maine, Germany. October 25, 1894. The essential particulars are the combination of devices and fac-simile signature of the applicants.

183,354.—PNEUMYNE. A medicine for human use, for whooping cough, bronchitis, coughs, colds and other affections of the chest.—James Roberts, 58, Huddersfield Road, Elland. November 2, 1894. The essential particular is the fac-simile of the applicant's signature.

183,823.—DEVICE OF CLAW HOLDING OVAL OBJECT. Goo cure.—Benjamin Hosegood, 6 and 7, Artillery Street, London. November 22, 1894.

184,058.—DEVICE OF A FROG. Medicated confections for human use.—Hance Brothers and White, Marshall Street, Philadelphia, Penn., U.S.A. December 1, 1894. 3,908.—NURIUM. All goods in Class 14.—Reynolds and 18 Branson, 13, Briggate, Leeds, Yorkshire. November 27, 1894.

Unclassified Advertisement.

ENGAGEMENT wanted as IMPROVER. Tall. Time for study. In or near London. E. A. S., 5, Serle St., W.C.

Notes.

HUNTERIAN RELICS.—Portraits of John and William Hunter, John Hunter's clock, and two volumes of valuable autographs have been presented to the Royal College of Surgeons by Mr. William Hunter Ballie.

PROFESSOR PRINGSHEIM'S LIBRARY.—We learn from the *The Athenæum* that the heirs of Prof. Pringsheim, who was President of the Deutsche Botanische Gesellschaft from its foundation in 1883 have made over to that society his extensive library, together with the sum of 25,000 marks for its maintenance. In accordance with the statutes of the Botanical Society no library was to be maintained in connection with it, but the munificent gift was nevertheless gratefully accepted.

SALE OF FOOD AND DRUGS ACT.—At the annual meeting of the London Chamber of Commerce, the following resolution was agreed to:—"That in the opinion of the Chemical Trade Section of this Chamber, the Council of the Chamber should, upon the re-assembling of Parliament, put itself in communication with the Select Committee of the House of Commons, having under its consideration the revision of the Sale of Food and Drugs Act, with the object of urging that a Board of Reference for appeal in cases of disputed analyses should be constituted, such Board of Reference, so far as drugs are concerned, to consist of at least four persons, being the nominees of (1) Inland Revenue Authorities, Somerset House; (2) Society of Public Analysts; (3) Medical Council of Great Britain and Ireland; (4) Pharmaceutical Society of Great Britain."

LEGACY TO THE BENEVOLENT FUND.—We understand that a legacy of £100 has been left to the Benevolent Fund of the Pharmaceutical Society, under the will of the late William Hooper, of Camborn Lodge, Surbiton, and Russell Street, Covent Garden, a Founder of the Society. The total value of the deceased's personal estate amounted to £57,101.

UNIVERSITY EXTENSION MANUALS.—In connection with this series of manuals, "An Introduction to Physical Science," by Professor Cox, of Montreal, is in course of preparation.

A BRITISH PHARMACIST IN AUSTRALIA.—According to the *Australasian Journal of Pharmacy*, Mr. Sidney Plowman, F.R.C.S., has been appointed medical officer for the shires of Frankston, Somerville, and Hastings, Victoria.

CARBOLIC ACID AS A POISON.—We understand that Mr. Sydney Taylor, the Deputy-Coroner for North Derbyshire, has forwarded to the Privy Council a resolution of the jury at an inquest held at Rowsley, on January 21, to the effect that carbolic acid should be scheduled as a poison.

NEW PHARMACY JOURNAL.—A new Belgian publication, the *Annales de Pharmacie*, conducted by Dr. Fernand Ranwez, will deal with practical pharmacy, pharmacognosy, chemistry, toxicology, microscopy, hygiene, and professional interests.

EVENING MEETING IN LONDON.—The next evening meeting of the Pharmaceutical Society will be held on Wednesday, February 13, when Professor Greenish will deliver an illustrated lecture on the histology of ipecacuanha root, and Dr. Paul will exhibit and describe the alkaloids obtained by himself and Mr. Cowley from the same drug. A demonstration will subsequently be given of the method of using Sir George Johnson's "picro-saccharometer."

SOME POPULAR REMEDIES.—An interesting article under this heading appears in *Chamber's Journal* for January 19. Cobweb, matico leaves, boiling tar, herb teas, St. John's wort, the giant puff-ball, carrageen, bladder-wrack, gelsemium, tongs, cocaine, and menthol are amongst the remedies treated of.

ROYAL SOCIETY ELECTIONS.—The *Technical World* remarks that the present method of electing the Fellows of the Royal Society is not ideal. That Oxford and Cambridge expect to get a certain proportion of the vacancies by wire-pulling the Council is said to be notorious. Unless a candidate is either a Don and wealthy, or possesses much patience, his chances are feeble. That patience is a virtue is manifested by the Oxford Don who tried patiently seven times and at last got in, whilst last year another such was successful after half-a-dozen "shots." The quality or even the quantity of a candidate's papers of original work are of very subsidiary importance, the main question being how many 'Varsity friends or friends' friends are on the Council.

A NEW DICTIONARY.—Dr. Fennell of Cambridge is to be the editor and general superintendent of the 'National Dictionary of English Language and Literature,' which will cover the period from the middle of the fourteenth century to the present day. Every quotation will have its date and reference, and the projectors announce that the dictionary will include a great number of authoritative words and phrases not printed in any book of its class.

OPIUM COMMISSION.—The Royal Commission on Opium began its sittings for the final revision of the report, at the India Office, on January 23. Lord Brassey was in the chair, and among others present were Sir James Lyall, G.O.I.E., Sir William Roberts, M.D., F.R.S., Mr. Wilson, M.P.; Mr. Mowbray, M.P., and Messrs. Fanshawe and Pease.

DEGREE FOR PROF. BURDON SANDERSON.—In a congregation held at Oxford, on January 29, the degree of doctor of medicine was conferred upon John Scott Burdon Sanderson, M.A., F.R.S., Fellow of Magdalen College, Regius Professor of Medicine, by decree of the House.

PROCEEDINGS OF THE CHEMICAL SOCIETY.—In *Nature* for last week, Professor Ramsay points out that on the title-page of this periodical now occur the words "Edited by the Secretaries." It appears that the Council of the Chemical Society, to secure rapid publication, has chosen to leave entirely to the discretion of the secretaries—as editors—the condensation or re-writing of abstracts supplied by authors, and Professor Ramsay's letter is apparently intended as a protest against the discontinuance of the practice of supplying proofs of abstracts to the contributors of papers.

THE PHONOGRAPH IN TYPOGRAPHY.—As a matter of interest, Sir B. W. Richardson mentions that the first article in the current issue of the *Asclepiad*, occupying some twelve pages, was dictated by him into Messrs. Hazell, Watson, and Viney's phonograph. The operation occupied rather more time than reading the same article aloud from print, but yet was surprisingly rapid, and the compositor set up the type from the phonographic "echo" with extraordinary correctness.

JUNIOR PHARMACY BALL.—The fourteenth Junior Pharmacy Ball will be held at the Portman Rooms, on Wednesday, February 13, when dancing will commence at 9 p.m. Tickets (7s. 6d. each) may be obtained of the Honorary Secretary, Mr. H. Arliss Robinson, 29, Chapel Street, Belgrave Square, S.W.

ELECTION RESULTS.—In last week's Supplement it was stated in error that Mr. N. H. Martin had been elected a member of the Newcastle-upon-Tyne Board of Guardians. As would be apparent from the newspaper extract quoted on a subsequent page, this should have been Newcastle-upon-Tyne School Board.

Legal and other News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

PRESCRIBING BY A CHEMIST.—Mr. F. W. Powell, of 207, Southampton Street, Camberwell, writes to say that the paragraph quoted from the *Times* on page 18 of last week's Supplement is incorrect in referring to Mr. J. Johnstone, of 218, Kentish Town Road, as also of Southampton Street, Camberwell, since he purchased the Southampton Street business from Mr. Johnstone last February. That business, therefore, has no connection with the case referred to.

ORGANISED SCIENCE SCHOOLS.—The Science and Art Department of the Committee of Council on Education has issued a scheme embodying the new rules for Organised Schools. The work of these may be carried on either in day classes or in evening classes, but no Organised Science School will be recognised as such unless it has at least twenty students at its formation, nor will it continue to be recognised beyond two years after its formation unless it has a fair proportion of students taking the advanced course. An Organised Science School must provide a thorough and progressive course of education in science combined with literary or commercial instruction adapted to students who have received an education equivalent to that set out in Standard VII.

of the English Code for a Public Elementary School. In the Organised Science Day School every student upon whom the variable grant is claimed must be presented in the obligatory subjects of science, in the art subject, in at least one language, and also in some literary or commercial subjects which have been approved in the time-table submitted to the Department. Not less than thirteen hours per week must be allotted to instruction in the science and art subjects, and not less than ten hours for the other subjects, including two hours for manual instruction. This last condition will not come into force till after the year 1898. The most important feature of the new scheme is the introduction of payment on inspection instead of payment on results for by far the larger part of the instruction given in Organised Science Schools. This modification, which applies to 120 Science Schools in the United Kingdom, has only become possible since the appointment of a staff of Science and Art inspectors. It also appears that provision is made for a certain amount of literary instruction being given whilst the student is pursuing his Science curriculum; that greater freedom is given to the teacher as to the syllabus he is to teach in the first two years of a student's course; that a choice of advanced courses is given; and that an alternative programme suitable for women is formulated, and instruction in subjects specially adapted to them is demanded; whilst practical instruction must be given in the subjects of Science simultaneously with the theoretical instruction.—*Standard*.

A SCIENTIFIC AERONAUTIC VOYAGE.—The last and most important scientific aeronautic voyage made by Dr. A. Berson in the balloon "Phoenix," on December 4 last year, is described by that gentleman in the *Journal of Aeronautics and Atmospheric Physics*. The ascent of the balloon took two hours and twenty minutes; the descent full three hours. The most important results were as follows:—1. The arrival at a greater height than was ever reached before—9150 metres; 2. The ascertaining of an unusually low temperature at that height, and a much greater lowering of the temperature between 1500 metres and 9200 metres than was ever before accepted for the winter; 3. A change of temperature mornings and evenings till the height of 1500 metres; 4. Relatively very weak insulation even at the greatest height; 5. Humidity in the highest regions, and fine mist in the sky to the enormous height of more than 10,000 metres; 6. Snow-flake structure of the cirrus-clouds at 9000 metres; 7. Tremendous increase of the swiftness of the wind upwards, for, with almost perfect calm on the surface of the earth, more than 310 kilometres were made in five hours seventeen minutes, which gives a medium swiftness of 16½ metres per second.—*Daily News*.

PHARMACEUTICAL FOOTBALL CLUB.—A match was played on Saturday between the Pharmaceutical team and Stormont, on the ground of the former at Wormholk Farm. The Stormont eleven arrived late, and having won the toss, decided to play with the wind. From the kick-off the ball was passed out to Sawdy, who was playing outside on the right. He promptly took it down, and making a long shot from a very difficult point, scored the first goal for the home team. This seemed to wake up the visitors, who pressed hard, and were dangerous for a while. Stoddart playing in goal conceded a corner, but the ball fell behind. A second corner kick was obtained, but the ball was got away. Soon afterwards, however, Stormont equalised, and the score at half-time was one goal each. During the first part of the second half the Stormont team played well and succeeded in adding another

goal, after which the combination among the Square men became rather loose, and their opponents conceived ideas of winning. The Pharmaceutical captain, however, seeing that Sawdy could do more if well backed up, changed Woodruffe from left half-back to right, when some remarkably well-combined play was shown by all the right wing, consisting of S. Sturton, back; Woodruffe and Surfleet, halves; and P. K. Allen, Smith, and Sawdy, forwards. Allen, playing in the centre, sent the ball down with a long kick, and following it up sharply easily scored, again equalising. Then Sawdy and Smith, by means of some clever passing, worked the ball down, and after some exciting exchanges with the Stormont backs and goal-keeper Sawdy again scored, soon after which Bateson acting as referee blew the whistle, a well-contested game thus ending in the Pharmaceuticals winning by three goals to two.

CITY AND GUILDS OF LONDON INSTITUTE.—The Executive Committee of the City and Guilds of London Institute have awarded the first Salters' Company's Research Fellowship for the encouragement of higher research in chemistry in its relation to manufactures to Martin O. Foster, Ph.D., F.C.S. Dr. M. O. Foster was a student at the City and Guilds Technical College, Finsbury, during three sessions (1888 to 1891), and subsequently graduated Doctor of Philosophy (*magna cum laude*) at the University of Würzburg. For several months he has been engaged in investigating some new derivatives of camphor in the Research Laboratory of the City and Guilds Central Technical College, and by the aid of the Salters' Company's Research Fellowship he proposes to pursue this line of work.—*Daily News*.

SUPPOSED ATTEMPTED SUICIDE AT EXETER.—William Hare, well known as "Dr. Hare," made an attempt, it is supposed, to poison himself on Jan. 24. He went to the Victory Inn, St. Sidwell's, Exeter, at about lunch time, and called for a glass of ale. While sitting at the table he was seen to take out two bottles, one of which was labelled "Poison. Syrup of Poppies." He drank from it, and almost immediately afterwards he became unconscious. One or two in the room endeavoured to rouse him, but without success, and he was taken to the back of the house, and a cab sent for. Sergeant Dymond happened to be passing the house at the time, and was called in. On the arrival of a cab the driver refused to take the fare in consequence of the condition of Hare, who had been vomiting freely. His refusal was severely commented upon by the bystanders. Detective Dymond proceeded to the New North Road stand, and procured another vehicle, in which Hare was conveyed to Dr. Bell's residence, and medically treated. He soon recovered sufficiently to be removed to the Police-station. He will be charged with attempted suicide this morning. The unfortunate man is well known in the city. He formerly kept a chemist's shop in Paris Street, and rendered valuable assistance during the last cholera epidemic. After this he started a printing business, which was not particularly successful. A short time since Mr. Hare was given an almshouse.—*Devon and Exeter Daily Gazette*.

CASE OF ALLEGED IMPERSONATION.—At the Greenock Sheriff Court, on January 24 and 25, John Conner, druggist's assistant, sued William Cairns, medical practitioner, for £500 damages for slander, in that he had made statements to the effect that Conner had not passed the First examination of the Pharmaceutical Society, but had conspired with Francis Lambie, of Greenock, who passed the examination in his stead.—Dr. Cairns first gave evidence to

the effect that he had been told that Conner had not passed the examination, and that Lambie had been heard to say that he had personated Conner.—John Conner denied that he had been personated, and stated that he attended the examination and was successful in passing. Lambie only assisted him in his studies.—Francis Lambie confirmed the evidence of the previous witness in these respects. When he told certain persons that he had passed Conner's examination he meant that he had "coached" him.—Other witnesses then gave evidence as to having seen Lambie in the examination room at Edinburgh on the day in question, though they did not recognise Conner as having been present, and, ultimately, the case was taken in *avizandum*.

BOYS BURNED BY CARBOLIC ACID.—Andrew Scott, aged 13, residing at 6, Mill Road Street, and William Dick, aged 14, residing at 5, Union Street, Calton, were treated at the Royal Infirmary on Wednesday, Jan. 23, for carbolic acid burning. The boys were employed in Wellpark Brewery. While in the place on Wednesday Scott took a capsule off a bottle, filled it with carbolic acid, in the belief that it was ink, and was about to throw it at Dick, when a third boy struck up his hand, scattering the contents of the capsule upon Scott and Dick, both of whom were seriously burned about the face and neck. It seems that the boys had no right to be in the room where they met with the accident.—*North British Daily Mail*.

APPLICATIONS OF ELECTRICITY.—The *Electrician* in its issues of January 4 and 18 gives a mass of statistics concerning the progress of electrical industries—especially in relation to the application of electricity to lighting and power work. A sheet table shows at a glance the gradual introduction of electricity supply works, and a sketch map illustrates the systems adopted by the local authorities and companies who are responsible for the supply of electric current. Curves show the increase in "lampage" (i.e., use of the incandescent electric light) during the past four years, reaching the total of 1,600,000 in 1894, against 1,125,000 in 1893. A coloured map shows the areas allotted to the various metropolitan companies and local authorities, the thoroughfares through which the mains are laid, the position of the supply stations, etc., and letterpress in the same issue shows the capital outlay at present employed in providing electric current. The rapid development of electric lighting enterprise may be said to date from January 1, 1893.

VICTORIA INSTITUTE.—At a meeting of the Victoria Institute, held on January 21, a paper on the Australian Flora, by Dr. Woolls, whose botanical researches in New South Wales have extended over half a century, was read by Surgeon-General Gordon, C.B. In it Dr. Woolls reviewed the history of botanical researches in that colony since the days of Banks, Salander, Flinders, Bauer, Caley, and Cunningham, and lastly the splendid work done by Von Mueller, whose list of the Australian flora extended to nine thousand species. He described the classification of these, and concluded by referring to the debt due to Woods, Stephens, Wilkinson, and Sir W. Macleay. The paper was full of interest, not only to the botanist, but as an historical sketch of the work of the pioneers of civilization in the colonies. An interesting discussion ensued.—*Daily News*.

MR. C. GODDARD CLARKE, J.P.—Mr. C. Goddard Clarke, of Ingleside, Elm Grove, Peckham, who has just been made a J.P., has done good service to Cam-

berwell on its vestry and board of guardians. He is a member of the firm of Potter and Clarke, druggists, who are said to have one of the most varied and extensive stocks of crude botanic drugs in existence. Mr. Clarke will be remembered as the jurymen who questioned the Prince of Wales when he was a witness in the baccarat case. He is in the prime of life, and a tremendous worker. At present he is acting as treasurer of the Peckham Liberal Association, and has successfully fought the Progressive battle in the most Tory part of the constituency. He is a Nonconformist and Sunday School teacher, and has been a member of Mr. Spurgeon's Tabernacle for many years.—*Star*.

EDINBURGH CHEMISTS' BALL.—The twelfth annual ball was held in the Freemason's Hall, George Street, on the evening of Thursday 24th ult. Dancing commenced at 9 p.m. and continued till 3 a.m. on Friday, the music being supplied by Messrs. Dunn and Davidson's band. Messrs. R. Butchart and G. Melvin acted as M.C's., and under their guidance a company of about eighty couples passed a very pleasant and enjoyable evening. At supper Mr. J. Laidlaw Ewing, chairman of the North British Branch Executive, proposed "Success to the Chemists' Ball," and Mr. D. MacLaren, Convener of the Ball Committee, replied. Mr. MacLaren proposed "The Pharmaceutical Society," and Mr. Ewing replied. Mr. Peter Boa, Chairman of the Edinburgh District Chemists' Trade Association was present, and also representatives from each of the wholesale drug houses in Edinburgh and Leith. Among those who, from a distance, gave their countenance and support were Messrs. Alfred Bishop and Sons, Burroughs, Wellcome and Co., Oppenheimer, Sons and Co., E. Rimnel, Johanns Co., Fasset and Johnson, and Blondeau and Cie., London; Evans, Sons and Co., Liverpool; and R. Gibson and Son, Manchester.

IMPURE PRECIPITATED SULPHUR.—Colin Client, trading as a druggist, at 20, Bolton Road, Small Heath, was summoned at the Birmingham Police Court, on Friday, January 25, for selling on December 13, to the prejudice of the purchaser, two ounces of precipitated sulphur containing 47 per cent. of sulphate of lime. The Inspector under the Food and Drugs Act proved purchasing the sulphur which, according to the certificate of Dr. Alfred Hill, city analyst, contained 47 per cent. of sulphate of lime. Defendant said it was the old form of milk of sulphur, and was generally given when milk of sulphur was asked for. He and his brother had only bought the business a short time, and really had had no time to go through the stock, but were assured by their predecessor that everything was according to the British Pharmacopoeia. He had been in the trade thirteen years, but had only traded on his own account about a month. A penalty of 10s. and costs was imposed.

Press Comments.

OXFORD NATURAL HISTORY SOCIETY.—The meeting of the Oxford Natural History Society, held at the University Museum, on January 23, was successful in every way. The Society was first founded in 1880 by Mr. Druce, who came here from a district where one of the most successful societies of the kingdom was in full working order. For years the Oxford club remained in a somewhat dormant condition, but it has now woke up to more active life, and from the humble beginning of half a score of ardent workers it has grown to a large and influential society. It numbers amongst its members many of the professors and distinguished scientists of the University, as well as enthusiastic naturalists, drawn from every section of

Oxford's citizens. At the present moment the Society is considering a means for spreading the knowledge of natural history throughout the county, and with a balance in hand of £60, its financial position is satisfactory. It is, therefore, but a meet reward for his labours as one of the founders that Mr. Druce has now had conferred upon him the highest honour at the disposal of the Society in the office of president for the ensuing year. Mr. Warde Fowler, the outgoing president, was very happy in remarking that as a Roman Historian and a naturalist he ought to know something about augury by birds, and he thought the following incident a good augury for the success of Mr. Druce's year of office: On Sunday, while walking in Christ Church Meadows, he heard the song of the chaffinch, which was ten days earlier than he had ever heard it before.—*Oxford Review*.

'ANNUAL OF THE UNIVERSAL SCIENCES, 1894.'—Dr. Sajons brings out once more his 'Annual of the Universal Sciences,' or yearly report of the progress of the general sanitary sciences throughout the world. (F. A. Davis & Co., New York; F. J. Rebman, London.) As before, he is assisted by seventy associated editors, with two hundred co-responding editors and collaborateurs. Every year it is a pleasing duty to notice this remarkable work, which, hitherto, has had no parallel, and is not likely, in our generation, to find any important rival. The volumes are five in number, and the general index by Dr. D. Braden Kyle, of Philadelphia, and Messrs. Eugene Devereux, A.M., and N. L. Devereux, of Paris, is of itself a most curious study, extending over sixty closely printed pages. Such is the care taken by each editor in his department that the whole of the medical science for the year is introduced; and, as the basis of the information, the reference list of journals from which the information is derived becomes itself a kind of "index medicus" for the year, the value of which is historical.—*Asclepiad*.

THE ELECTRICAL CONDUCTIVITY OF ORGANIC SUBSTANCES.—For the last ten years A. Bartoli has been investigating the electrical conductivity of organic substances and publishing papers at intervals on his results. He now draws the following conclusions respecting the dependency of the conductivity of aliphatic salts on temperature:—At ordinary temperatures, or at the boiling points, the electrical conductivity of aliphatic alkylic salts of small molecular weight is greater than those of their higher homologues. The conductivity of such salts increases with the temperature, the coefficient of increase of conductivity being greater for salts of high molecular weight than for their lower homologues; the temperature coefficient of the conductivity, therefore, increases as the viscosity of the salt increases. In the one or two cases in which the conductivity decreases with rise of temperature, the anomalous behaviour is explained by assuming the presence of a trace of an aliphatic alcohol. By adding such an alcohol the conductivity of a salt may be caused experimentally to decrease with rise of temperature. The electrical conductivity of a salt still increases as the temperature is raised on adding to it aniline, paraldehyde, a phenol, a ketone, or an acid.—*Electrical Review*.

FOOT POWDER IN THE ARMY.—A year or two back a firm of wholesale druggists produced an "Antiseptic Foot Powder," and were so fortunate as to obtain from the Horse Guards a letter signifying H.R.H. the Commander-in-Chief's approval of the article, and recommending to all Commanding Officers that it should be kept on sale in canteens. The foot powder has since become the sole property of a company,

which sends out circulars accompanied by a facsimile of the aforesaid Horse Guards' letter. The puffing of a proprietary article in this way in the name of the Commander-in-Chief is a curious proceeding, and it would be interesting to know who the present proprietors of the article are. Under the circumstances one would have expected that the powder would be supplied to the Army on specially favourable terms, but this does not seem to be the case. — *Truth*.

A NOVEL RAT POISON.—Enormous business has been done lately at French fairs by a man who professed to sell a rat powder that was perfectly harmless, and that struck rats dead on the spot. In order to convince the sceptical, the man first of all powdered a slice of bread with the stuff, and ate a piece of it himself. Then he put the remainder under a glass case, in which a rat was kept in captivity. The rat went to eat the bread and instantly fell dead. At five-pence a box the powder went off like hot rolls, and the lucky proprietor of the specific was in a fair way to make a fortune. But the police, who in France are very active in protecting the people from fraud, looked into the matter, and found that the powder was nothing but ordinary sugar. They also discovered that the case was connected with a powerful electric battery, and that the moment the rat touched the bread the current was turned on, and it was thus his death was brought about. The man was arrested at the fair of Albi, and he has been sentenced to fifteen days' imprisonment. — *Daily News*.

MR. JUSTICE VAUGHAN WILLIAMS.—In spite of the semi-official *démenti* on the subject, the news reaches us that the companies' winding up business is intended to be permanently transferred by the Lord Chancellor from Mr. Justice Williams to Mr. Justice Romer. The unsatisfactory state of business in the Queen's Bench Division is the pretext assigned for this contemplated change. The true reason, however, is very different. It is the annoyance given in high quarters by the firm, fearless, and admirable manner in which Mr. Justice Williams discharged his duty in the New Zealand Loan and Mercantile Agency Company case, and the fear that he may, in other pending matters, act with equal courage and decision. We hope Mr. Justice Williams will feel himself bound to state publicly the whole circumstances connected with his impending removal from the Court over which he has presided with the unanimous approval of the legal profession and the commercial community. If motives of delicacy restrain him from so doing, the task of exposing the deadly blow at the independence of the Bench which is involved in his removal, and of seeing that its would-be authors are called to account, may be foregone or pass into the hands of persons not so well informed. — *Law Journal*.

Obituary.

Notice has been received of the death of the following:

On January 8, Thomas Warburton, Chemist and Druggist, Atherton. (Aged 87.)

On January 13, Arthur Mason, Chemist and Druggist, Rochdale. (Aged 56.)

On January 16, Josiah Beswick Pratt, eldest son of Councillor Josiah Pratt, Chemist and Druggist, Stafford Street, Wolverhampton. (Aged 36.)

On January 20, Edward M. Watson, Pharmaceutical Chemist, Clifton. (Aged 71.) Mr. Watson had been a member of the Pharmaceutical Society since 1847.

On January 20, David Edwards, Chemist and Druggist, Bramhall. (Aged 81.)

On January 21, Charles Green, Chemist and Druggist, Brewood (Staffs.). (Aged 58.)

New Drug Companies Registered.

LONDON CHEMICAL COMPANY, LIMITED.—Registered with a capital of £10,000 in £1 shares, to enter into an agreement with E. J. Ellis, and to carry on the business of chemical manufacturers, druggists, dyers, oil and colourmen, etc. There shall not be less than two nor more than four directors. The first are E. J. Ellis and F. J. Hatchman. Qualification, one share. Remuneration, £156 each per annum. Registered office: Bow Bridge Wharf, Stratford, E.

LUNGILI COMPANY, LIMITED.—Registered with a capital of £5000 in £1 shares, to acquire and carry on the business of collectors, manufacturers, and vendors of a drug or medicine known as "Lungili," now carried on at 35, Ludgate Hill, Birmingham, and to adopt an agreement, dated January 15, 1895, between H. J. McCubbin and others of the one part and G. Holbrook, for the company, of the other part. There shall not be less than two nor more than four directors; the first are to be appointed by the subscribers. Qualification, £100. Remuneration, 7½ per cent. of the net profits, divisible.

JOHANNIS, LIMITED.—Registered with a capital of £141,000, in £1 shares (1000 deferred), to carry on business as owners, lessees, or concessionaires of mineral springs, mineral and aerated water importers, exporters, and manufacturers, licensed victualliers, brewers, and any other business which can be conveniently carried on in connection with the same. The first subscribers each take one share, and are:—Fred. Gordon, Bentley Priory, Stanmore, Middlesex, solicitor; Chas. E. Keyser, Aldermaston Court, Berks, J.P.; Ed. H. Byas, 10, Cambridge Gate, Regent's Park, gentleman; Ed. Ponsoby, 17, Cavendish Square, W., J.P.; John H. Tod, 10, Courtfield Gardens, S.W., gentleman; A. Saumarez, 17, Grosvenor Gardens, S.W., gentleman; C. W. Mann, 1, Southampton Street, Bloomsbury, accountant. There shall not be less than three nor more than eight directors, the first being:—Frederick Gordon, Charles E. Keyser, Edward Ponsoby, Edward H. Byas, J. H. Tod, and the Hon. Arthur Saumarez. Qualification, £500. Remuneration, £300 per annum and 5 per cent. on the net profits, divisible.

ELECTRICAL OIL REFINING COMPANY, LIMITED.—Registered with a capital of £5000 in £1 shares. Object, to adopt an agreement, dated January 21, 1895, between certain parties not named of the first part and H. W. Bradley, for the company, of the second part, and to acquire and develop certain patents relating to the bleaching, refining, sweetening, and purifying of oils and fats by means of electricity or otherwise. Registered without articles.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

A LABORATORY MANUAL OF ORGANIC CHEMISTRY. By W. R. ORNDORFF, A.B., Ph.D. Systematically arranged to accompany Remsen's 'Organic Chemistry.' (Heath and Co., London.)

ELECTRICAL ENGINEERING AS A PROFESSION: How to Enter it and Guide to the Engineering Profession. Official Edition. By A. D. SOUTHAM. (Southam and Co., London.)

A TEXT-BOOK OF HYDROSTATICS AND MECHANICS. By HERBERT HANCOCK, M.A., F.R.A.S. (Sampson Low, Marston and Co., London.)

THERMO-DYNAMICS. By J. PARKER, M.A. (Sampson Low, Marston and Co., London.)

MEASUREMENT OF ELECTRICAL RESISTANCE. By W. A. PRICE. (Clarendon Press, Oxford.)

DICTIONNAIRE D'ANALYSE DES SUBSTANCES ORGANIQUES INDUSTRIELLES ET COMMERCIALES. By Dr. Adolphe Renard. (Baudry et Cie., Paris.)

COLOUR VISION. Being the Tyndall Lectures for 1894. By Captain W. DE D. ABNEY, C.B., D.C.L., F.R.S. (Sampson Low, Marston and Co., London.)

Notes and Queries.

[The Editor will be glad to receive for publication notes of practical interest to pharmacists, and will also endeavour to furnish suitable replies to any queries that may be sent by readers.]

SYRUP OF IODIDE OF IRON AND ORANGE.

[802.] The following formula for syrup of ferrous iodide is suggested by O. Girard (*Bull. com.*, 1894, 562):—Iodine, 4·10 Gm.; iron filings, 2 Gm.; distilled water, 10 Gm. The solution having been prepared as directed in the Codex—by placing the iron filings and water in a flask, and adding the iodine in small quantities at a time, and agitating after each addition until the solution finally acquires a green colour—it is then mixed with 1 Kilo. of the following:—Citric acid, 5 Gm.; distilled water, 10 Gm.; tincture of orange peel, 10 Gm.; simple syrup, q.s., to make 1 Kilo. Twenty grammes of the finished syrup will contain 0·10 Ggm. of ferrous iodide.

NEW HAIR DYES.

[803.] According to M. Fréhes (*Journ. de Pharm.* [6], I., 59), hair dyes containing salts of lead, silver, etc., are being replaced by preparations containing metaphenylenediamine, diamidophenol, or other amine derivatives. Some of them require to be brought into contact with air, and contain sodium bisulphite to prevent oxidation in the bottle; others require the subsequent application of hydrogen peroxide to develop the black colour; and several of them contain glycerin. In certain cases skin eruptions have been traced to their use.

RESORCIN AS AN ANTISEPTIC.

[804.] For rendering rooms antiseptic M. Meillère (*Journ. de Pharm.* [6], I., 82) recommends the dissipation of phenols, etc., by heat. Naphthalin, anthracene, xylol, ordinary phenol, cresols, naphthols, benzoic acid, oxybenzoic acid, salol, betol, benzonaphthol, chloral, formal, and mercury sulphides and chlorides are indicated as useful for this purpose, but resorcin is particularly recommended. It is best mixed with a little hydrochloric acid, and the mixture should be heated in an open dish. Afterwards, it is well to evaporate rapidly 100 Gm. of water, either pure or acidulated with acetic or hydrochloric acid.

COLD CREAM.

[805.] This preparation can be improved in appearance and keeping properties by the addition of a small proportion of the white variety of soft paraffin. White wax, 20 Gm., is gently heated with almond oil, 80 Gm., until dissolved; and, simultaneously, borax, 1 Gm., is dissolved by the aid of heat in rose water, 40 Gm. The aqueous solution is then gradually added to the mixture of oil and wax, the whole being stirred continually, and stirring is then continued until the product is almost set. Now add white soft paraffin, 20 Gm., again stir until thoroughly incorporated, and add otto of roses, q.s. A beautifully smooth product should be obtained, which will keep unaltered for an indefinite period.

COMPOUND SYRUP OF THE HYPOPHOSPHITES.

[806.] The following formula is said by a writer in the *Western Druggist* to yield a non-precipitating syrup of fine appearance:—Calcium hypophosphite, 256 gr.; sodium hypophosphite, 128 gr.; potassium hypophosphite, 128 gr.; manganese hypophosphite, 16 gr.; tinct. citro-chloride of iron, N.F., 1 oz.; tinct. nux vomica, 160 m.; quinine hydrochlorate, 8 gr.; sugar, 12 oz.; water to make 16 fl. oz. Dissolve the hypophosphites by trituration in 6 oz. of previously boiled water, dissolve the quinine salts in $\frac{1}{2}$ oz. of warm water, mix the two solutions and pour over the sugar. Shake well, add the tinctures and enough water to make 16 fl. oz. Again shake, until the sugar is dissolved, stand for 24 hours and filter.

Poisoning Cases and Inquests.

Carbolic Acid.—Joseph Hanson, aged 44, died on Friday, January 18, at Rowsley, from the effects of carbolic acid, self-administered. Verdict: "Deceased took carbolic acid whilst temporarily insane." The jury also added a recommendation that carbolic acid should be scheduled as a poison.—*Liverpool Mercury*.

Rubini's Tincture of Camphor.—At an inquest at Exmouth, on Monday, January 21, the deceased, Marie Smerdon was shown to have taken a large dose of Rubini's tincture of camphor. Verdict: "Death was caused by fatty degeneration of the heart, accelerated by taking a large dose of Rubini's tincture of camphor." The jury also added a rider calling the attention of the public to the care which should be exercised in using the tincture of camphor, as there seemed to be an erroneous impression with regard to its strength.—*Devon and Exeter Daily Gazette*.

Laudanum.—John Patterson died on Tuesday, January 22, at Burrow, from the effects of an overdose of laudanum, self-administered.—*Manchester Courier*.

Laudanum.—Jane Holmes, aged 19, died on Wednesday, January 23, in the Infirmary at Doncaster, apparently as the result of drinking laudanum and some form of vermin killer.—*Sheffield Independent*.

Carbolic Acid.—Charles Cartwright, aged 43, died on Wednesday, January 23, in the Northern Hospital, Liverpool, from the effects of carbolic acid taken in mistake for medicine. Verdict: "Death from misadventure."—*Liverpool Daily Courier*.

Poisonous Liniment.—Thomas Arthur Rowe, aged 39, died on Saturday, January 26, at Worcester, from the effects of a poisonous liniment, which deceased used for varicose veins in the legs.—*Birmingham Daily Post*.

Carbolic Acid.—Charles Allen, aged 58, died on Saturday, January 19, at Fanshaw Street, Southampton, apparently as the result of drinking carbolic acid.—*Southampton Echo*.

Publications received.

HAM'S INLAND REVENUE YEAR BOOK, 1895. Edited by E. GRANT HOOPER, F.I.C., F.C.S., JOHN MACDONALD, MICHAEL SIEYES, VICTOR MASLIN, and W. H. WILLS, of H.M. Revenue Stamps. Pp. 374. Price 3s. London: Eppingham Wilson and Co. From the Editors.

ZUR KENNNTNIS DER TOVARIACEEN. By G. LAGENHEIM. From the Author. Reprinted from the 'Berichten der Deutschen Botanischen Gesellschaft.'

TABLES AND DIRECTIONS FOR THE QUALITATIVE CHEMICAL ANALYSIS OF MODERATELY COMPLEX MIXTURES OF SALTS. By M. M. PATTISON MUIR, M.A. Pp. 44. Price 1s. 6d. London: Longmans, Green and Co. From the Publishers.

A MANUAL OF VETERINARY THERAPEUTICS AND PHARMACOLOGY. By E. WALLIS HOARE, F.R.C.V.S. Pp. 560. Price 10s. 6d. London: Ballière, Tindall and Cox. From the Author.

RESOLUTIONS PASSED AT THE EIGHTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY. Pp. 33. From the Secretary General. E. MERCK, Darmstadt. BERICHT ÜBER DAS JAHR 1894. From the Firm.

Trade Notes.

MARROL.—Under this name the Liquor Carnis Company, 28A, Farringdon Street, E.C., has introduced a preparation which is described as consisting of the yellow marrow (96 per cent. of fat) of ox-bone to which hopped extract of malt has been added in physiological proportion. It is not so sweet as "Virol," prepared from red marrow, which contains hæmoglobin and organic compounds of iron and phosphorus, and is more especially designed to serve as a fat food for adults. As such it should prove a distinctly useful preparation, and will probably be preferred to cod-liver oil, for it is decidedly palatable and not likely to be rejected by children or invalids. It is supplied in six-ounce wide-mouth bottles.

SOLAZZI.—The agents for this well-known brand of stick liquorice, in submitting a sample of it, call attention to a recent examination, the result of which proved it to be pure extract of liquorice, free from any admixture of foreign matter.

LYNCH & Co.'s NEW CATALOGUE.—Like the business of the firm publishing it, this catalogue increases year by year. It now contains nearly 450 large quarto pages, and is freely illustrated throughout. To save trouble in ordering goods the latter bear distinctive numbers, reference to which is sufficient to ensure correctness of execution, and the index to the sections most frequently referred to is placed in the most convenient place for a catalogue, i.e., in front of the volume.

POCKET THERAPEUTIC NOTES.—This little work, published by Messrs. Ferris & Co., of Bristol, has now reached its second edition. It now contains more than 200 pages of notes on new drugs and remedies, and improved pharmaceutical preparations. As a price-list it is perhaps more likely to attract attention than many larger, though less attractive, publications.

CHANGE OF TRAVELLERS.—Messrs. Burroughs, Wellcome and Co. desire to notify the trade that Mr. C. Stanley Richards, who recently travelled for the firm in the South of England, has not been employed in that capacity since January 17 last.

ENEMA RACK.—Messrs. Reynold and Branson, of Leeds, have just brought out a useful and simple enema rack, an illustrated description of which will appear later.

ACCIDENT TO MR. THONGER.—Mr. W. H. Thonger (representative of Mr. J. F. Wilkinson, Manchester), who is making satisfactory progress towards recovery from his recent accident, has left the Birmingham General Hospital, and is now being attended at his home, Bearwood, by Dr. Middleton, of Harborne.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*.]

Where complete Specification accompanies Application, an asterisk is suffixed.

No. 23,446.—Isidore Joseph Gudendag, 52, Chancery Lane, London.—A carrier or holder for material for taking the impression or mould of jaws for dental purposes.* December 3, 1894.

No. 23,451.—Johannes Tabel, Vellahn, Mecklenburg-Schwerin, Germany.—Improvements in apparatus for measuring liquids. December 3, 1894.

No. 23,456.—John Alfred Whittard, 45, Southampton Buildings, Chancery Lane, London.—Improvements in respirators. December 3, 1894.

No. 23,493.—Frederick Trinder, 1, Fumival Street, Holborn, London.—A rectal dilator and irrigator.* December 4, 1894.

No. 23,500.—James Burwell, Abbey Grove, Lawson Road Colwyn Bay.—An improved pincers for dentists' use in lifting cases out of acid. December 4, 1894.

No. 23,511.—Roderick McLean Sanger and John Scott Sanger, 70, Wellington Street, Glasgow.—Apparatus for applying tooth-powder, December 4, 1894.

No. 23,577.—William Phillips Thompson, 6, Lord Street, Liverpool.—Improvements in, or connected with, the heating of fluids to a given temperature (*Albert Doemens, Germany*). December 4, 1894.

No. 23,588.—Thomas John William Lott, 340, Leytonstone Road, London.—Furniture Polish. December 4, 1894.

No. 23,623.—John Frankland, 21, Prospect Hill, Walthamstow, London.—Liquid Measures with funnel combined. December 5, 1894.

No. 23,635.—William Phillips Thompson, 6, Lord Street, Liverpool.—Improvements in massage apparatus. (*Martin Goetze and Heinrich Simons, Germany*). December 5, 1894.

No. 23,686.—Ferdinand Kraus, 37, Chancery Lane, London.—Machine for packing powdered materials.* December 5, 1894.

No. 23,711.—Claude William Parnell, Queen's College, Cambridge.—Adjustable combinations of lenses for optical instruments. December 6, 1894.

No. 23,738.—Clarence Fenton Slater, 20, Baker Street, Portman Square, London.—An improvement in sprays. December 6, 1894.

No. 23,759.—William Beverley and J. Scott Riddell, 115, St. Vincent Street, Glasgow.—An improved safety-pin for surgical and other uses. December 7, 1894.

No. 23,769.—Philip Benjamin Laskey, 70, Wellington Street, Glasgow.—An improved hypodermic syringe for dentists. December 7, 1894.

SPECIFICATIONS PUBLISHED DURING JANUARY.

Magnesium Hydrate (M. N. D'Andria).—Magnesia is produced by treating the mixture of lime and magnesia obtained by calcining dolomite with saline solutions, in which lime is said to be much more soluble than in fresh water. No. 24,563 of 1893.

Embrocation (W. H. Simmons).—An embrocation or liniment, suitable also for inhalation when added to boiling water, is prepared by admixture in a stated manner, of eggs, olive oil, oleum terebinthinæ, malt vinegar, tinctura opii, spirits of hartshorn, lin. saponis, oleum origani, and spirit of camphor. No. 1241 of 1894.

Preparations of Coffee and Cocoa (A. Lebre).—Mixtures of condensed milk with coffee extract and chocolate respectively. No. 4049 and 4050 of 1894.

Supplying Liquids from Bottles (J. Maggi).—The bottle stopper or cap is fitted with a tube shaped somewhat like a teapot spout and fitted with a side tube by which air enters the bottle as the liquid is poured out at the spout. The flow may be stopped or controlled by wholly or partly closing the end of the side tube with the finger. No. 3230 of 1894.

Hair-dye (A. Lumière).—The hydrochlorate or other salt of diamido-phenol is dissolved in dilute alcohol, with the addition of sodium sulphite to prevent too rapid oxidation when applied to the hair. By varying the strength of the solution, various shades from suburn to black may be obtained. No. 21,336 of 1894.

Vermis Killer (A. B. F. Wegemund).—A composition for destroying vermin on fowls, animals, &c., is prepared by mixing stated quantities of alcohol, aniseed oil, olive oil, rape-seed oil treated with chopped onion, castor oil, linseed oil, and almond oil. No. 31,815 of 1894.

Bed-urinal for Females (R. A. Grosse).—A specially-shaped bed-pan is described and illustrated by a drawing. No. 2943 of 1894.

Distributing Antiseptics and Disinfectants (H. P. Morin).—The liquid is volatilised in a closed vessel, and the vapour passes through inclined nozzles against a pivoted vane which is thereby rapidly revolved and distributes it. Solutions of corrosive sublimate, etc., are forced by a pump through a groove or passage between two metal plates which are heated by a burner; both antiseptic and solvent are thus simultaneously volatilised, and issue together at a nozzle. No. 3927 of 1894.

Funnel (R. A. Brown and F. S. Bond).—The funnel has a gravitation valve which automatically closes when the bottle or other vessel to which it is applied becomes full. The valve prevents passage of liquid on removing the funnel, but again allows it to flow when applied to another bottle. No. 23,462 of 1894.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SUNDAY, FEBRUARY 3.

Sunday Lecture Society, at 4 p.m.

"The Restoration of Extinct Animals," by Arthur Smith Woodward.

MONDAY, FEBRUARY 4.

Royal Institution of Great Britain, at 5 p.m.

General Monthly Meeting.

London Institution, at 5 p.m.

"The Evolution of an Historical Picture" (Illustrated), by Seymour Lucas.

Victoria Institute, at 4.30 p.m.

"Insect Anatomy" (Illustrated), by Dr. Gerard Smith.

Society of Chemical Industry (London Section), at 8 p.m.

"Some Matters of Interest in the Manufacture of Coal Gas," by Lewis T. Wright.

TUESDAY, FEBRUARY 5.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

Royal Institution of Great Britain, at 8 p.m.

"The Internal Framework of Plants and Animals" (Fourth Lecture), by Professor C. Stewart.

Central London Throat, Nose, and Ear Hospital, at 4.30 p.m.

"The Methodical Diagnosis of Diseases causing Discharge from the Ear," by Dr. Dundas Grant.

Aberdeen Chemists' and Druggists', Assistants', and Apprentices' Association, at 9.30 p.m.

Paper by Mr. Pennie.

Society of Arts (Applied Art Section), at 8 p.m.

"Drawing for Process Reproduction," by Gleeson White.

WEDNESDAY, FEBRUARY 6.

Pharmaceutical Society of Great Britain, at 11 a.m.

Meeting of the Council.

Society of Arts, at 8 p.m.

"The Labour Question in the Colonies and Foreign Countries," by Geoffrey Drage.

Geological Society of London.

"On Bones of a Sauropodous Dinosaur from Madagascar," by E. Lydekker.

"On the Physical Conditions of the Mediterranean Basin which have resulted in a Community of some species of Freshwater Fishes in the Nile and the Jordan Waters," by Professor E. Hull.

"On the Loess and other Superficial Deposits of Shantung (North China)," by S. B. J. Skertchly and T. W. Kingsmill. Communicated by Sir John Evans.

THURSDAY, FEBRUARY 7.

Linnean Society of London, at 8 p.m.

"The Comparative Morphology of the Galeodids," by H. M. Bernard.

"New Marine Algae from Japan," by E. M. Holmes.

Royal Institution of Great Britain, at 8 p.m.

"George Eliot, the Humourist, as Poet," by W. S. Lilly.

London Institution, at 6 p.m.

"The Germination of Barley" (Illustrated), by A. Gordon Salamon.

Chemists' Assistants' Association, at 8.30 p.m.

Musical and Social Evening.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

"Forest Trees," by Miss E. M. Wood.

Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.

"Notes on Revision of the Pharmacopœia," by G. Lunan.

Chemical Society, at 8 p.m.

"The Electromotive Force of an Iodine Cell," by A. P. Laurie.

"The Action of Heat on Ethylic β -amidocrotonate," by Dr. Collie.

"The Acidimetry of Hydrofluoric Acid," by Professor Haga.

FRIDAY, FEBRUARY 8.

Royal Institution of Great Britain, at 9 p.m.

"The Anti-toxin Serum Treatment of Diphtheria," by Dr. G. Sims Woodhead.

Royal Astronomical Society, at 8 p.m.

Annual General Meeting.

Sheffield Microscopical Society, at 8.30 p.m.

"Foraminifera," by Dr. Gordon.

SATURDAY, FEBRUARY 9.

Royal Institution of Great Britain, at 3 p.m.

"Hansel and Gretel" (with Musical Illustrations), by Sir A. C. Mackenzie.

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words, including name and address, are inserted free, but must not partake of the nature of ordinary advertisements.]

OFFERED.

BOOKS.—Squire, 14th edition; Valentin's 'Analysis,' 7th edition; good as new; sell cheap or exchange.—H. Smith, St. Luke's Grove, Southport.

'PHARMACEUTICAL JOURNAL.'—From 1878 to present time. Clean and in good condition; two years bound. What offers in cash or exchange?—W., 5, Sidney Road, Bowes Park, N.

HERBARIUM SPECIMENS of *Ferula narther*, and East Indian and British medicinal plants.—Holmes, 17, Bloomsbury Square, W.C.

LANCASTER'S $\frac{1}{4}$ -PLATE CAMERA, lens, two double-dark slides, and tripod. New condition. 29s. or exchange.—Tully, Chemist, Hastings.

DARTON'S MEDICAL BATTERY and accessories in case. Quite new. Cost £3 10s., take 25s. J. E. Whitaker, 148, Sutherland Street, Barrow-in-Furness.

WANTED.

'PHARMACEUTICAL JOURNAL.'—April 15, 1893, and May 6, 1893. Full price will be paid for clean copies by the Secretary, 17, Bloomsbury Square, London, W.C.

DRIED PLANTS.—*Cephaelis ipecacuanha* (South America), with flowers and roots; *Pilocarpus* species (South America), with flowers and fruits; *Strophanthus* species (East Africa), with flowers and fruits.—Holmes, 17, Bloomsbury Square, W.C.

BENTHAM'S 'BRITISH FLORA.'—Second-hand.—Johnston, Chemist, 69, Loughborough Road, Brixton, S.W.

TOOTH-STOPPING INSTRUMENTS.—Modern, by good maker. Cheap.—Approval to W. Hindle, Chemist, Gorleston, Great Yarmouth.

BOOKS.—Maish's 'Materia Medica,' and 'Principles of Pharmacognosy,' by Flückiger and Tschirch, in good order and latest editions.—O. T. Elliott, Belgrave, Leicester.

Trade Marks Applied For.

[Compiled from the *Trade Marks Journal*.]

182,142.—THREE STARS SUPERPOSED. Caustic soda.—Jaff Bros. and Co., 48, West Regent Street, Glasgow, September 11, 1894.

182,860.—DEVICE OF AN OBLONG CIRCLE-ENGRAVED LABEL, BEARING FAC-SIMILE SIGNATURE OF THE APPLICANTS. Chemical substances used in manufactures of philosophical research, and anti-corrosives.—Thomas Tyrer and Co., Stirling Chemical Works, Abbey Lane, Stratford, London. October 12, 1894. The essential particulars are the combination of devices, and the fac simile signature.

Weekly Drug and Chemical Report.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between these prices and those of the wholesale drug trade.]

ACID, CITRIC.—Remains neglected at unchanged prices, but the market is very weak in tone. Offered at from 1s. 1½d. to 1s. 2d.

ACID OXALIC.—A fraction easier; still the prices are very fairly maintained. Manufacturers quote at 8½d. ex rails.

ACID, TARTARIC.—Both English and foreign makes are steady, but in very quiet demand. Returns:—English, 10½d. to 11d. Foreign, crystals, 10½d.; powder, 10½d.

ALOES.—Firm. There is a fair demand for good grades of Curaçao aloes at firm rates, which also applies to clean Capey varieties; rough, dark livery parcels are, however, entirely neglected. Prices:—Curaçao in gourds, 52s. 6d. to 62s. 6d., good livery; Cape, 20s. to 21s., medium quality.

AMMONIA SALTS.—**SULPHATE.** The market still continues very steady, the prices being somewhat in advance of last week. Present quotation: grey, 24 per cent., £11 8s. 9d. Carbonate very steady, prices advancing somewhat in accordance with those of sulphate. Quotation, 8½d. to 4d.

ASHER.—Pearl are very steady at a slight advance, quotations now being 40s. for American, with pots at 38s.

ARSENIC.—Quiet, but steady. Powdered white is still worth from 14s. 9d. to 15s.

BALSAM CAPAIBA.—Steady at last week's rates, varying from 1s. to 1s. 7½d., the latter being readily obtainable for good Maranhão.

BALSAM, PERU.—In small demand at 6s. 6d.

BALSAM, TOLU.—Flat. A good grade commands 1s. 2d. inferior, 8d. to 6d.

BLEACHING POWDER.—Steady at unchanged prices in a quiet market. Quotation, 8s. 3d. to 8s. 6d.

BORAX.—A fairly brisk market, but prices remain unchanged at 20s. for crystals and 21s. powdered.

CASCABILLA.—Very steady, the advanced prices being maintained. Bold, part silvery bark is quoted at 52s. to 53s.

COCHINEAL.—Brisk market, attributable to speculative buying. The supply was poor, but wherever obtainable was readily bought up, the prices given being 1s. 2d. to 1s. 4d. for black, and 1s. 3d. to 1s. 4d. for silver.

COPPER SULPHATE.—Although last week's tendency to a further advance has not been continued, the prices remain very steady, varying from £14 15s. to £15 10s., according to brand.

CREAM OF TARTAR.—In good demand with strong upward tendency. Fine white crystals command 64s. ditto powdered, 66s. 6d. to 67s.

GUAIAKUM.—Very quiet, due to the poor quality of that offered, which is mostly drossy block, fetching from 3½d. to 3½d.

HONEY (Jamaica).—In small demand only at somewhat easier prices.

IPÉCACUANHA.—Prices are still low, Carthagena root fetching from 2s. 9d. to 3s. 2d.

JALAP.—Quiet, but little root of fair quality offered. Quotation, 1s. 3½d. for fair Vera Cruz.

KOLA NUTS.—Steady. South American nuts of good bold quality are worth 1s. 4d. to 1s. 6d.

MERCURIALS.—An advance of 1d., the amended prices being: Calomel, 2s. 9d.; red precipitate, 3s.; white do., 2s.; corrosive sublimate, 2s. 5d.

OILS (fixed).—*Linseed* is steady at £19 17s. 6d. landed. *Cotton*; A trifle easier, refined, £17 5s. to £18 10s. *Cocconut*: Steady; Ceylon, £23; Cochin, £25. *Rape*: Firm, unchanged; refined being still worth £23. *Turpentine*: Quiet, a trifle easier; American spirit being offered at 20s. 10½d. *Petroleum*: Unchanged; American, 4½d. to 4½d.;

Russian, 3½d. to 4d.; petroleum spirit, ordinary, 7d.; deodorised, 7½d. to 7½d.

OPIUM.—The market is quiet; still the prices are well maintained and in some cases higher. Holders of Persian are firm, and there is considerable demand for it, although sales are only small. Turkey, best selected, 12s. 6d.; best seconds, 11s.; "druggists," 10s. to 11s.; Persian, 11s. to 12s.

PIMENTO.—Very steady, although business done is but moderate. Quotations for fair quality average 2½d.

POTASH COMPOUNDS.—*Prussiate*. Prices show that last week's decline has been maintained, although it has touched 10½d. Closing quotations, 10d. to 10½d. The remaining compounds are mostly at the old rates. *Chlorate*, 5d.; *Bichromate*, 4½ to 4½d.

QUASSIA.—Very steady. Business moderate at increased prices up to 24 17s. 6d.

QUICKSILVER.—Prices very fairly maintained. In first hands prices rule 28 12s. 6d.; in second hands 26 11s.

QUININE SULPHATE.—Market very dull and little doing. Holders of German makes at second hand quote at 11d.

SHELLAC.—In slow demand privately, and sales are but small, the basis being 107s. for TN orange, whilst Garnet is quoted at 108s. At Tuesday's sales the supply was small and competition good. No Garnet was offered. The prices realised show an advance of 1s. to 2s. on the last sales.

SODA COMPOUNDS.—*Caustic* is in improved demand, prices ruling from 28 to 28 10s. for 70 per cent. white, with 21 less for 60 per cent. *Crystals* are stationary at 88s. *Bicarbonate* 27 5s. London.

CHILLIES.—Very quiet. 135 bales of medium Zanzibar were all bought in at 25s.

CLOVES.—Very little doing, no Zanzibar offered. Picked Penang bought in at 7d. Some sales of low pickings 1893 import at 2½d.

GINGER.—*Cochin*: Supplies only small, and sales but slow. Quotations:—Shrivelled pickings, 25s. 6d.; good bright medium, and small washed, 36s.; good bright washed, 70s. *Japan*: 25 bags of limed offered without reserve fetched 20s. *African*: Without reserve, 23s. 6d. to 28s. 6d.

GALLS.—Market very steady, with a tendency to advance. Spot sale, 50s., with good business in arrival sales.

INDIGO.—The first quarterly auction of the year was held on the 28th and 29th inst., when 8,500 chests were offered, the bulk consisting of lots bought in at the October sale. Prices varied considerably, but closed very firm, the quotations generally showing an advance on those obtained at the last auction.

Amount and result of January sales:—

	Declared.	Sold.
1895.....	chests 8500	2050
1894.....	6850	2000
1893.....	5300	2300
1892.....	4100	1600

Cinchona Shipments in 1894-95.

During the seasons 1894-95, the total shipments of cinchona bark from Ceylon have been as follows, the figures representing pounds:—

	1894.	1895.
January	311,885	440,661
February.....	55,557	479,198
March.....	246,261	536,183
April.....	184,000	263,701
May.....	79,697	291,142
June.....	265,334	485,996
July.....	590,000	113,654
August.....	412,373	200,000
September.....	90,620	132,435
October.....	89,373	239,663
November.....	34,544	152,831
December.....	182,778	332,923

Total..... 2,444,317 lbs. 3,571,335 lbs.

Late News.

EDINBURGH DISTRICT CHEMISTS' TRADE ASSOCIATION.—A meeting of the Association was held in the Pharmaceutical Society's House, 36, York Place, Edinburgh, on Tuesday, January 29, at 9 p.m., Mr. Peter Boa, President, in the chair.

The minutes of last meeting were read and approved. The Association went into committee to consider the question of the illegal sale of poisons in the form of photographic chemicals and antiseptic preparations, and it was remitted to the Committee with powers to make enquiry and take any action that might be considered necessary.

A discussion then took place as to the desirability of communicating with medical men in reference to the prescribing of stamped medicines, and it was remitted to the Committee to draft a circular to be submitted for approval at next meeting.

Mr. Henry, the Secretary, then drew attention to the sale of crushed linseed cake for linseed meal. Recently a professional nurse in his district had complained that he did not supply the best linseed meal. He found she had been accustomed to see the crushed linseed cake employed in connection with a public institution where she had been trained. What he supplied was the finest ground linseed containing the oil. He was requested to procure some of the correct (?) article, and on applying to an ordinary tradesman (not a chemist) for linseed meal he was supplied with the ordinary crushed linseed cake, minus the oil, without any hesitation. He had had a similar complaint made by a medical practitioner, who said the linseed meal he supplied was not the best. He had looked up the cases and found that recently a person had been convicted in Perth for selling crushed linseed cake as linseed meal, the prosecutor maintaining that the ground linseed of the Pharmacopœia alone could be sold as linseed meal. They could not supply crushed linseed cake as linseed meal without becoming liable to a penalty under the Food and Drugs Act. Crushed linseed cake appeared to be very extensively sold as linseed meal, and even doctors and nurses seemed to think it was the best article. It was annoying to find that such persons were saying one did not sell the best linseed meal when the direct contrary was the fact.

After discussion it was agreed that the report of what had been said should be communicated to the journals and newspapers, so that attention might be called to the subject.

The meeting then closed.

INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND.—The following are the names of the candidates who passed the examination of the Institute held in January, 1895:—

A. E. Bell, Owen's College, Manchester, and Royal College of Science, South Kensington;

C. S. Ellis, Owen's College, Manchester, and University College, Aberystwith;

M. O. Forster (Ph.D., Wurzburg), Finsbury Technical College;

J. Lones, Mason College, Birmingham, and registered student under A. E. Tucker, F.I.C.;

G. H. Russell, Yorkshire College, Leeds;

W. H. Sodeau, King's College, London;

W. L. Sutton, University College, London;

W. G. Young, University College, London, and registered student under W. C. Young, F.I.C.

Technical Notes.

[From the *Technical World*.]

The following is a proposed solder for use with aluminium or aluminium alloys, invented by Mr. B. J. Roman. Silver, nickel, aluminium, tin, and zinc are mixed in the following proportions: silver, 2 per cent.; nickel, 5 per cent.; aluminium, 9 per cent.; tin, 34 per cent.; zinc, 50 per cent. No flux is necessary, and any soldering iron or tool may be used, though one of aluminium is said to be preferable.

A new process of extracting gold from auriferous ores, by means of bromine, has been elaborated by Herr C. Lørsen. He electrolyses a solution of potassium bromide, and obtains an alkaline solution which contains hypobromide and bromate, which is capable of dissolving gold. The ore is treated with excess of this solution by rotating cylinders; the solution is then filtered, the gold precipitated by passage over a mixture of iron and coal, and the solution, which now mainly contains potassium bromide, is electrolysed once more, and again used for extraction.

Ferrous sulphate and lime are again coming to the front in the treatment of sewage. Manganate of soda has held the pre-eminence for a considerable time now, but, as the result of recent experiments, it is likely that a larger trial will be made of the former, and that they will be found to yield more satisfactory results than are obtained at present.

The process of manufacturing calcium carbide by heating in an electric furnace a mixture of coal dust and lime is now well known. The appearance of this material in masses resembles the mineral serpentine, being of greenish-grey colour, with a lustre like feldspar. If a few drops of water are thrown on this seaming rock, gas is given off, which, if ignited, burns with a brilliant flame, and will continue to blaze, if supplied with water, until the mineral is exhausted. It is proposed to use the gas thus produced for local gas-engines. A charge of the mineral is placed in a closed vessel, in which a regulated supply of water is admitted. A little water entering evolves a quantity of gas, whose pressure shuts off the water, and as the gas is exhausted more water is admitted to renew the supply. Whether the cost of producing this compound in the electric furnace would be such as to allow of its industrial application remains to be proved; but it would be of use in certain cases where the economic question was not controlling, and it is certainly a very curious compound.

Unclassified Advertisements.

WANTED, ASSISTANT with Minor qualification, about 25 years of age, for a Mixed business. Please send photo and all particulars as to age, height, salary required, and references, to THOS. KNOWLES HEY, Chemist, Hebden Bridge, Yorkshire.

AS ASSISTANT. Good class country: 2 years' last 14 years' previous situations. Age 33. Height 6ft. 1in. B., Woldridge, Billingham.

WANTED immediately, Part-time ASSISTANT. Full board and comfortable home, for principally morning duties. Good experience required. No salary. F. C. F., 10, Shrewsbury Rd., Bayswater.

AS JUNIOR OF IMPROVER. Age 21. 5 years' experience. Good reference. WYNDHAM, 13, Elmstone Rd., Fulham, S.W.

Notes.

EVENING MEETING IN LONDON.—At the evening meeting of the Pharmaceutical Society, on Wednesday next, February 13, Professor Greenish will contribute a paper on "The Histology of Ipecacuanha," which will be profusely illustrated by lantern slides. Afterwards Dr. B. H. Paul will deal with "The Chemistry of Ipecacuanha," and exhibit specimens of the three alkaloids extracted from the drug by Mr. A. J. Cownley and himself. The makers of Sir George Johnson's "Picro-Saccharometer" have also promised to provide a practical demonstration of the method of employing the instrument. The President will take the chair at eight o'clock.

EVENING MEETING IN EDINBURGH.—At an evening meeting of the Society to be held in the Society's House, 36, York Place, Edinburgh, on Friday, February 15, Dr. Ralph Stockman and Mr. D. B. Dott, will contribute a paper on "Ricinoleate of Magnesium," and Mr. Dott will also read one on "The New British Pharmacopœia." Mr. J. Laidlaw Ewing, Chairman of the Executive of the North British Branch, will take the chair at 8.30 p.m.

CHEMISTS' ASSISTANTS' ASSOCIATION.—The seventeenth annual dinner of this Association will be held at the Cannon Street Hotel, on Thursday, March 7, at 8 p.m. Mr. Walter Hills, of the firm of John Bell and Co., will act as chairman on the occasion.

JUNIOR PHARMACY BALL.—Readers are reminded that this ball will be held at the Portman Rooms, on Wednesday next, February 13, at 9 p.m., and that application for tickets should at once be made to Mr. H. Arliss Robinson, 29, Chapel Street, Belgrave Square, S.W.

ANTIDOTE TO CHLORAL.—In the *Glasgow Medical Journal* for February, Dr. J. Dougall suggests that if potassium hydrate in sufficient quantity could be safely administered in cases of poisoning by chloral, there are strong *à priori* grounds for assuming that in about fifteen minutes the chloral would be entirely decomposed into potassium formate and chloroform. He is of opinion also that 7 grains of KHO, equal to 112 minims of liquor potassæ, might be given without fear of causing untoward symptoms, if highly diluted, and by this means 20 grains of chloral would soon be decomposed.

THE OPIUM COMMISSION.—Extra sittings of the Opium Commission are being held with a view to issuing the official report by the end of the present month.

NEW EDITION OF THOMPSON'S 'ELECTRICITY.'—This week Messrs. Macmillan and Co. issue a new edition of Professor Silvanus Thompson's 'Elementary Lessons on Electricity and Magnetism.' The work has been almost wholly re-written, and many new illustrations have been added,

DEATH OF MR. S. M. BURROUGHS.—We learn with regret, from Mr. Henry S. Wellcome, that Mr. S. M. Burroughs, of the firm of Burroughs, Wellcome and Co., died at Monte Carlo on Wednesday morning from pneumonia.

'CANADIAN DRUGGIST.'—The office of the *Canadian Druggist* has been removed from Strathroy to Toronto, Ontario, simultaneously with the commencement of its seventh volume.

SUPPLEMENT TO THE CODEX.—The last edition of the French Pharmacopœia—the 'Codex Medicamentarius'—was published in 1884, and a supplement to the volume, which has just been issued, comes none too early. It contains a table of the densities of mixtures of water and absolute alcohol at 15°C., together with additions to the four parts of the Codex—crude vegetable drugs, chemicals, galenicals, and veterinary preparations.

RUMFORD PRIZE FUND.—The special thanks of the members of the Royal Institution were voted to Professor Dewar, at the monthly meeting on Monday last, for his donation of the Rumford Prize Money to the fund for the promotion of experimental research at low temperatures.

SHOULD DOCTORS DISPENSE?—A somewhat heated controversy on this subject has recently engaged the attention of medical men, pharmacists, and the general public in the Birmingham daily papers. One of the letters published is reprinted at page 36 of the Supplement, and part of a very pertinent editorial note appears at page 38.

'KERNER'S NATURAL HISTORY OF PLANTS.'—The tenth part of Oliver's translation of this comprehensive work deals with the structure of the flowers and the numerous devices found in plants for self-protection, distribution of pollen, and fertilisation. It is prefaced by a handsome coloured plate representing the *Victoria regia* in the River Amazon.

PEAS WITH HONOUR.—Under this heading a Clifton correspondent sends information that the case in which a grocer was charged with adding copper to green peas, originally heard at the Bristol Police Court on Friday, January 11, was dismissed (see Supplement, p. 18).

APPOINTMENTS.—Mr. W. Baker, of Lewisham High Road, has been appointed Divisional Secretary of the Pharmaceutical Society for Deptford, in succession to Mr. Dymott, who is retiring from business, and Mr. Frederick Carter, of Carshalton, has been appointed Local Secretary for the Carshalton district.

CASE OF ALLEGED PERSONATION AT GLASGOW.—Judgment was given in the Greenock Sheriff Court on February 6 in favour of the defender, in the case of Conner v. Cairns, with expenses against the pursuer,

Legal and other News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

COLLECTIVE INVESTIGATION CONCERNING ANTITOXIN.—An official investigation of the results of sero-therapy will be made by the German Imperial Government. The hospitals of any importance throughout the Empire are invited to take part. They must give a minute account of every case treated; if bacteriological examination was performed they must say if only Löffler's or other bacilli have been found; also they are asked if the curative effect of antitoxin was certain, probable, or not at all remarked. The answers are to be sent to the German Imperial Health Office, where they will be collected and published. Another collective investigation will be made by the *Deutsche Medicinische Wochenschrift*, but this is not confined to hospitals only, but extends to all practitioners in Germany. Cards have already been sent to them with the following questions:—How many of your patients were treated with, and how many without, antitoxin? How many in both these categories recovered, and how many died? There are subdivisions for the ages of the patients, and the complications are also to be reported. The scientific and statistical work will be done afterwards by a committee, whose principal members are Professors Behring, Leyden, Heubner, and Ehrlich, and some other leading men.—*Lancet*.

SOCIETY OF CHEMICAL INDUSTRY.—A meeting of this Society was held at the Victoria Hotel, Manchester, on February 1, the President (Mr. P. F. Carpenter) presiding.—Mr. J. Carter Bell, the secretary, read a paper on "Fractional Distillation and its Results," in the absence through illness of Professor Wanklyn, the author. Mr. Bell exhibited a specimen of debased rubber tubing, which, he said, contained only 10 to 15 per cent. of india-rubber. He remarked upon the possible danger to human life from gas leakage through such tubing, as adulterated rubber was easily fractured. Mr. Soudder exhibited a specimen of calcic carbide, which, on the addition of water, evolves acetylene gas. Some discussion ensued as to the possibility of using acetylene thus prepared as an illuminant.—*Manchester Guardian*.

ADULTERATED TINCTURE OF RHUBARB.—At Halifax on Saturday, Feb. 2, Henry Johnson, grocer, Elland, was summoned under the Adulteration of Food and Drugs Act for selling adulterated tincture of rhubarb. Mr. Brutton, on behalf of the West Riding County Council, said this article more than any other was sold in an adulterated state in the West Riding. A sample obtained at the defendant's shop was found on analysis to be very deficient in alcoholic strength, to contain less than two-thirds of the spirit directed by the British Pharmacopœia, and to be entirely destitute of saffron. The label on the bottle from which the sample was taken said: "Best compound tincture of rhubarb, made from the genuine root. Buy only from recognised chemists, and so avoid cheap and nasty imitations." Mr. W. Storey, for the defence, contended that the inspector who got the sample was told that the defendant had only the compound tincture, and he asked him to read the label on the bottle. The contents of the bottle were obtained three years ago from Mr. Waterworth, of Preston, who had written offering to pay half the expense of a solicitor to defend the case, and expressing his sorrow that the defendant had been put to such annoyance "through no fault of his own." The

Bench said the Act was passed to protect those who could not help themselves, and the defendant would have to pay £2 fine, with 18s. costs, and the analyst's fee.—*Manchester Guardian*.

PROPOSED MEMORIAL TO THE INVENTOR OF FRICTION MATCHES.—Mr. Registrar Crosby recently presided at a meeting in the Town Hall, Stockton, convened to take steps to promote a memorial to the late Mr. John Walker, chemist, Stockton, who invented the friction match. Ald. Saunderson, J.P., was appointed president of a committee, and a number of influential gentlemen were appointed vice-presidents, an executive being also appointed. As a recommendation to the latter committee, the following resolution, moved by Mr. Joseph Parrot, to whose efforts the movement is due, was adopted—"That the proposed monument consist of a temple, after the design of the Roman temple of Vesta, in which, among other things, there shall be a series of representations on the outside, in bas-relief, illustrating the history of the methods of obtaining fire and light by different peoples in ancient and later times; that the detailed elaboration of such a design be left to the Executive Committee, acting on the advice of such competent persons as they may think fit to consult; that estimates be procured and subscriptions invited."—*Yorkshire Herald*.

CHEMISTRY OF THE ATMOSPHERE.—Mr. J. A. Wanklyn writes as follows in the *Daily Telegraph*: "It is not the first time that, within my own experience, the organisation of our Royal Society has been employed to give currency to a myth. On a former occasion it was a so-called calculus, wherein the symbols of mathematics were used so as to stimulate the application of mathematical operations to chemical questions. Now we are informed that about 1 per cent. of the volume of the air, or that about 1½ per cent. of its weight, consists of a new substance. The experimental result, however, is that only about one-twentieth of 1 per cent. is exhibited. As I was not one of the invited, I could not attend in person at the meeting on Thursday last; but I have read the published reports, and I see no reason to alter my opinion as to the part which nitrous oxide bears in the chemistry of the atmosphere."

SHOULD DOCTORS DISPENSE?—Under this heading a correspondent of the *Birmingham Daily Mail* says:—"Such a monstrous state of things is not for a moment allowed on the Continent, and why the English Government should allow a man the privilege of writing out death certificates, and yet at the same time sanction his dispensing the medicine for his patients, is beyond all conception. I would submit three important suggestions why doctors should not dispense, and these, I think, must appeal to any intelligent person as reasonable:—(1) Their right to give certificates of death and dispense medicine at the same time. (2) Their insufficient knowledge of dispensing; the knowledge of pharmacy and practical dispensing required for their examinations not being a tenth part of that required by the Pharmaceutical Board of Examiners from their candidates. (3) Their liability to substitute cheaper medicines than those which would be of greatest value to the patient in order that their drug account may be kept down. Now, these are not fanciful ideas but bare facts, which my own impartial experience indicates, and of which I have constantly seen the result. Of course, the patient is the sufferer, and I, for one, always take great care that my medicine is never dispensed in the slobbery manner carried out in so many of our doctors' surgeries."

VICTORIA INSTITUTE.—A meeting of this Institute took place on February 4, when Dr. Gerard Smith delivered a lecture on the structure of insects, in which he described the various species and their nervous systems, from the most highly organised to the lesser organised, the lecturer taking occasion to indicate those lines which seemed to separate the various species, and his remarks were illustrated by numerous microphotographs shown by oxyhydrogen light.—*Daily News*.

NATURAL HISTORY IN THE CITY.—The annual conversazione of the City of London Entomological and Natural History Society, held on February 5 at the London Institution, was a brilliant success. The Society began its career about forty years ago in a very humble way, holding its meetings, with less than a dozen members, in a tavern room in Haggerston; but it has advanced steadily until it is now flourishing on a firm foundation, and housed in the well-known institution in Finsbury Circus. It has for its objects the diffusion of natural history by means of papers, discussions, exhibitions, and the formation of collections for reference, and at the fortnightly meetings a special feature is the systematic discussion and exhibition of interesting genera of insects. Mr. J. A. Clark is again both President and treasurer, and the hon. secretaries are Mr. C. Nicholson and Mr. A. U. Battley. Amongst the company at the conversazione were some of the naturalists who have recently maintained the interesting correspondence in *The Daily News* upon the Camberwell Beauty, some fine specimens of which were exhibited. Amongst the Lepidoptera were a splendid collection of the great Copper butterfly, which used to be taken in the fens, but for some reason or other, probably not a little on account of new systems of drainage and the merciless zeal of the collector, the species as a British butterfly became extinct about fifty years ago. The exhibitor of these butterflies, Mr. T. Hanbury, a member of the committee, brought from Italy, for the express purpose of the soiree, a number of recently-gathered fruits and flowers, including almost every variety of the citron family. They covered a large round table, and were one of the most popular attractions of the evening. In one recess of the library were three perfect specimens of wasp's nests (*Vespa britannica*), one of them presenting the curious form of being built in Scotch heather. The classified and large collection of dried specimens of rare or extinct British plants were worthy of much better study than the members and visitors could bestow upon them in a hall where there were so many interesting objects, to say nothing of the music and conversation, to divide attention. Perhaps to entomological students the most priceless exhibits were found in the cabinet drawers in which Mr. Elisha treasures his tiny moths, the micro-lepidoptera, insects which are the widest contrast that could be pitted against the three great Goliath beetles of Africa. There were cases of birds, reptiles, and small mammalia on view, and a great variety of shells and geological curiosities. The London Institution had kindly lent the Society for the night the most interesting and rare books on natural history from the library shelves, and a new invention of his own in connection with micro-photography was shown and explained by Dr. W. A. Kibbler.—*Daily News*.

SILVER MEDAL FOR MR. W. L. HOWIE.—In the Edinburgh Photographic Society's Exhibition at

present being held in the Society's Rooms, 38, Castle Street, Edinburgh, the silver medal for landscapes, half-plate and under, has been awarded to Mr. W. Lamond Howie, our local secretary at Eccles. Among the pictures not entered for competition is a cleverly-executed enlargement from two quarter-plate negatives by Mr. Howie, showing an extensive view of Balmoral deer forest from Lochnagar.

SALE OF DEFICIENT SPIRIT OF NITROUS ETHER.—At the Bridgnorth County Petty Sessions on Saturday, February 2, Richard Wilson, chemist, Claverley, was summoned for an infringement of the Food and Drugs Act by selling to Police-constable Roberts six ounces of spiritus ætheris nitrosi (spirits of nitre) which was not composed of ingredients in accordance with the demand of the purchaser. On the 9th ult. the constable, under the direction of the Chief Constable of Shropshire (Captain Freeman), visited the defendant's shop, at Claverley, and purchased from him 6 oz. of spiritus ætheris nitrosi, for which he paid eighteenpence. On analysis, the sample was found deficient in nitrous ether to the extent of about 50 per cent., the alcohol being deficient by 24 per cent. The defendant admitted that the drug supplied was not in accordance with what was demanded, but urged that the constable did not take proper precaution to retain the strength of the sample in its transmission to the analyst.—The Bench fined the defendant £1, including costs.—*Midland Evening News*.

ABERDEEN AND NORTH OF SCOTLAND SOCIETY OF CHEMISTS AND DRUGGISTS.—The annual dinner of the Aberdeen and North of Scotland Society of Chemists and Druggists was held in the Douglas Hotel, Market Street, on Thursday evening, January 31, Mr. John Johnston (President) in the chair, Messrs. James Paterson and N. Davidson croupiers. After doing ample justice to a dinner purveyed in Mr. Stott's very best style, the following toasts were submitted and duly honoured:—"The Queen and the Prince and Princess of Wales, etc.," from the Chair; "The Pharmaceutical Society," proposed by Mr. John Cruickshank, responded to by Mr. Johnston. "The Aberdeen and North of Scotland Society" was proposed by Mr. Tocher, Peterhead; Mr. James Paterson responded. Mr. Andrew Craig gave "The East Aberdeenshire Association," and Mr. Tocher replied. "Town and Trade of Aberdeen" got ample justice in the hands of Mr. Giles and Mr. Ritchie. Mr. William Davidson proposed "The Health of our Chairman," and Mr. Johnston suitably replied.

SEQUEL TO THE KEATING CASE.—In the *Scotsman* of Saturday, February 2, the following advertisement appeared under the heading "Keating v. McCallum":—"I, Thomas Keating, Insect Powder Manufacturer, London, hereby withdraw the charges of fraudulently selling as and for Keating's Powder, powder not manufactured by me, and other charges preferred against Alexander Inglis McCallum, chemist and veterinary surgeon, 19, Grassmarket, Edinburgh, in the Record in the action of suspension and interdict recently raised by me against him in the Court of Session, and I regret that said charges should have been made.—Thomas Keating, January 22, 1895. We are informed that Keating has, in addition, paid £50 to MacCallum, the sum awarded in the case Foster v. Keating, recently decided.

Press Comments.

A LOCALISED HOT-AIR BATH.—A new method of treating sprains, stiff and inflamed joints, and similar affections by means of a localised hot-air bath has been adopted at St. Bartholomew's Hospital, after prolonged trial in the wards by Mr. Alfred Willett, F.R.C.S., and has also been successfully tested by Mr. Mayo Collier at the North-west London Hospital. These credentials leave little doubt that Mr. Tallerman's ingenious appliance constitutes a really valuable addition to our present very imperfect means of dealing with a peculiarly troublesome and unsatisfactory class of cases. There is nothing in the least mysterious about this hot-air bath; it is merely a novel and legitimate development, with some particular advantages, of that familiar method of treatment by means of the local application of heat, which forms one of the fundamental principles of professional and domestic surgery. In other words, it acts like a poultice or a hot-water fomentation, but more powerfully, and with some special effects in addition which are not obtainable by means of moist heat. The use of dry air permits of the application of a far higher temperature, and, at the same time, effects the removal of morbid products by profuse exudation and evaporation through the skin. The apparatus consists of a copper cylinder about 3 feet long and 18 inches in diameter, which comfortably accommodates an arm up to the shoulder, or a leg up to the middle of the thigh. It stands on an iron frame, and is heated by gas burners placed underneath, so that the temperature can be gradually raised up to 300° or even 400° Fahr. The patient sits in an armchair opposite one end of the cylinder, which is placed at a convenient height, and inserts the limb to be treated through an india-rubber curtain attached to the aperture. The limb rests comfortably on felt pads inside the cylinder, and the position can be maintained with ease for an indefinite time. It is found that patients usually prefer a temperature of about 150° to begin with, and a gradual rise up to 250°. No discomfort is felt at this temperature until perspiration occurs, when the moisture has a scalding effect, which is at once removed by opening the further extremity of the cylinder and allowing the moisture to escape by evaporation. A sitting usually lasts for forty minutes or more, and its immediate effects are an enormously increased circulation in the part, which becomes bright red, a profuse local perspiration and a slight rise in the general temperature of the body, also accompanied by free perspiration. The treatment has been applied with striking success to cases of both chronic and acute inflammation of the joints, whether due to gout, rheumatism, or injury. In acute cases the first effect, and in the patient's eyes the most important, is the immediate relief from pain.—*Standard*.

ARGON.—The jealousy of the chemists at the achievement of the spectroscopists in discovering a new constituent in the atmosphere was perhaps very natural, as it seemed hardly credible that the mere physicist should have accomplished what whole generations of chemists had failed to do. It was undoubtedly humiliating and galling for the chemists, but they did the only thing possible—they accepted the position yesterday with magnanimity and even generosity. Since chemistry does not hold a monopoly of discovery, and since science is theoretically supposed to move in a sphere far removed above such petty conflicts as afflict the politicians, the chemists should have hailed the discovery by the physicians with open arms. But

the revelation convicted them of having jumped at their conclusions and accepted the elemental character of nitrogen on an incomplete induction, and that, too, in a generation in which chemistry claims to have been almost completely reconstructed. And the discovery suggests that many other conclusions of the chemists should be tested; for if an error lurked in their conceptions of so common a thing as nitrogen, where may other fallacies not lurk?—*Liverpool Mercury*.

THE BELGIAN POISONING MYSTERY.—The great Belgian trial is over, and Madame Joniaux has been found guilty on all the counts, and condemned to death. A more extraordinary trial has rarely taken place. The sex, age, and social position of the prisoner, and the enormity of the crimes imputed to her, all tend to give it exceptional importance. She has been convicted of poisoning—first, her sister, Mdlle. Léonie Ablay; then her uncle, M. Van der Kerckhove, an ex-Senator and a wealthy manufacturer; lastly her brother, M. Alfred Ablay. The brother and sister, according to the theory of the prosecution, were poisoned after she had effected insurances on their lives; the uncle because she expected to inherit his large fortune. There was a dim perspective of other charges of the same sort against her. Her first husband, for instance, was said to have died under very suspicious circumstances.—*Daily News*.

THE GREAT PHYSIC QUESTION.—The correspondence which is now going on in our columns between the doctors and the druggists must be highly suggestive to the general reader. It is a case of hammer and tongs. It is very curious this venomous hostility between two occupations so closely allied. Yet, when we get at the root of the animosity it is all very plain. Each accuses the other of encroaching on his peculiar domain. The doctor objects to the druggist, or chemist, or pharmacist, as he prefers to be called, diagnosing and prescribing for patients, and he in his turn has like views on the doctor who makes up his own prescriptions. If the public are to believe all that the one charges against the other because of this confusion in their respective spheres of duty, the only inference that can be drawn is that they both do a great deal more harm than they do good. Some of the experiences given by the writers of the various letters are enough to make a man forswear doctors and drugs for ever. . . . Just as the chemist has to meet the public demand for prescribing, so the doctor has to respond to the call made upon him to dispense. It is the public who are to blame for the one branch of medicine encroaching on the other in places where convenience does not require their being combined, and so long as the public do not cry out against the drawbacks and the dangers thereby created, the doctors and the chemists are beating the air in railing at each other.—*Birmingham Daily Mail*.

Publications Received.

- KERNER AND OLIVER'S NATURAL HISTORY OF PLANTS.** Part 10. Pp. 209-320. Price 2s. 6d. net. London: Blackie and Son. From the Publishers.
- THE RELATION OF STATIC DISTURBANCES OF THE ABDOMINAL VISCERA TO DISPLACEMENT OF THE PELVIC ORGANS.** By J. H. KELLOGG, M.D. Pp. 30. Battle Creek, Mich.: Modern Medicine Publishing Co. From the Author.
- THE GALENIC PREPARATIONS OF THE BRITISH PHARMACOPEIA.** A Handbook for Medical and Pharmaceutical Students. By C. O. HAWTHORNE, M.B. Pp. 118. Price 4s. 6d. London: J. and A. Churchill. From the Publishers.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

- HOME BOOK OF MEDICAL TREATMENT.** By ROBERT BELL, M.D. 6s. (David Bryce and Son, Glasgow.)
- PRACTICAL URANALYSIS AND URINARY DIAGNOSIS.** By Dr. CHARLES W. RINDY. (F. A. Davis, Philadelphia; F. J. Rebman, London.)
- COMMENTAR ZUR PHARMACOPOEIA HELVETICA.** Editio tertia. By Dr. CARL DÜNNENBERGER, Art. Institut Orrell Füssli. To be published by subscription at 12 francs. Orders to be addressed to Dr. C. Dünneberger, Apotheker in Zürich.
- CLINICAL LECTURES AND ESSAYS ON RICKETS, TUBERCULOSIS, ABDOMINAL TUMOURS, AND OTHER SUBJECTS.** By Sir WILLIAM JENNER, Bart., G.C.B. (Livington, Percival and Co., London.)
- LENS WORK FOR AMATEURS.** By HENRY ORFORD. (Whittaker and Co., London.)
- ELEMENTARY PRACTICAL CHEMISTRY.** By J. T. HEWITT, M.A., and F. G. POPE. 9d. (Whittaker and Co., London.)
- HINTS ON SNOW PHOTOGRAPHY.** By Mrs. MAIN. Price 1s. 6d. (Sampson Low, Marston, and Co., London.)
- POPULAR TREATISE ON THE PHYSIOLOGY OF PLANTS, FOR THE USE OF GARDENERS, ETC.** By Dr. P. BORAUER. Translated by F. E. WEISS, B.Sc., F.L.S. 8vo., 9s. net. (Longmans, Green and Co., London.)
- SWEET-SCENTED FLOWERS AND FRAGRANT LEAVES.** By D. McDONALD. With introduction by W. Robinson. With sixteen coloured plates. Cr. 8vo., 5s. (Sampson Low and Co., London.)
- THE PHOTOGRAPHER'S STUDIO APPOINTMENT BOOK.** (Hiffe and Sons, London.)
- PROGRESS OF SCIENCE. ITS ORIGIN, COURSE, PROMOTERS, AND RESULTS.** By J. VILLIN MARMERY. With an introduction by SAMUEL LAING. (Chapman and Hall, London.)
- BREAD, BAKEHOUSES, AND BACTERIA.** By F. J. WALDO, M.D., and D. WALSH. (London: Baillière, Tindall, and Cox.)
- NOTES ON MEDICAL SERVICES IN WAR.** By W. H. MCNAMARA. 1s. (Gale and Polden, London.)

New Company Registered.

YEATMAN AND CO., LIMITED.—Registered by Lewis Davis, 19, Moorgate Street, E.C., with a capital of £25,000 in 25,000 preference, 50,000 ordinary, and 10,000 management shares of £1 each. Object, to acquire and take over as a going concern the business of Yeatman and Co.; to adopt and carry into effect an agreement, dated January 29, 1895, between Albert M. Woolf and Mortimer Woolf of the one part and Alfred T. Davey for the company, of the other part, and to carry on the business of purveyors, manufacturers, brewers, distillers, packers, bottlers, and dealers of and in food stuffs, provisions, confectionery, perfumery, edible, drinkable, and consumable commodities, condiments, preparations, essences, and articles dealt in by grocers, Italian warehousemen, chemists, druggists, druggists' sundriesmen, and drysalers. The first signatories are:—

Shares.

J. Woolf, manufacturing chemist, 1, Marlborough Place, St. John's Wood, N.W.	1
A. Woolf, traveller, 1, Marlborough Place, St. John's Wood, N.W.	1
A. T. Davey, accountant, 86, Kimberley Road, Clapham Rise, S.W.	1
J. E. Flynn, clerk, 1, Cloudeley Square, N.	1
E. Copland, brewer, 143, Albany Street, N.W.	1
W. Andrew, foreman, 7, Denmark Street, E.	1
N. G. Gray, clerk, 8, Brackham Street, S.E.	1
There shall not be less than two nor more than four directors; the first are to be appointed by the signatories to the memorandum of association. Qualification, 500 ordinary shares. Remuneration, 5 per cent. of the net profits after the dividend has been paid on the preference shares.— <i>Financial News.</i>	

Poisoning Cases and Inquests.

Liquid Ammonia.—Elizabeth Murphy, aged 4, died on Saturday, January 26, in the Royal Infirmary, Liverpool, from the effects of liquid ammonia. Verdict: "Death from misadventure."—*Liverpool Post.*

White Precipitate.—Arthur Watson, aged 40, died in the Nottingham General Hospital on Sunday, January 27, from the effects of white precipitate, taken in mistake for lemon kaff. Verdict: "Death from misadventure."—*Nottingham Guardian.*

Laudanum.—William Bramley, aged 32, died on Friday, January 25, in the Infirmary at Sheffield, from the effects of laudanum self-administered. Verdict: "Suicide whilst of unsound mind."—*Sheffield Telegraph.*

Aqua Fortis.—Robert Jordan Mann, aged 59, died on Thursday, January 24, in the Tottenham Hospital, from the effects of aqua fortis, self-administered. Verdict: "Suicide whilst temporarily insane."—*Midweek Gazette.*

Laudanum.—On Wednesday, January 23, the infant child of Moses Heap, of Oxloade, died from the effects of laudanum, administered in mistake for Godfrey's cordial. Verdict: "Death by misadventure."—*Wisbech Standard.*

Strychnine.—Bertha Attwood, aged 16, died at 338, Monument Road, Birmingham, on Tuesday, January 29, from the effects of rat poison containing strychnine, self-administered. Verdict: "Suicide whilst temporarily insane."—*Birmingham Daily Post.*

Laudanum.—Elizabeth Mayes, aged 60, died at Martham, on Wednesday, January 30, from the effects of an overdose of laudanum, taken to relieve pain. Verdict: "Deceased died from misadventure through her having taken an overdose of laudanum to relieve pain."—*Norfolk Standard.*

Chloral.—John Russell Henson, aged 35, died on Saturday, February 2, at the Grosvenor Hotel, Manchester, from the effects of chloral, taken to produce sleep. Verdict: "Deceased died from an accidental overdose of chloral."—*Manchester Evening News.*

Technical Notes.

[From the *Technical World.*]

According to the *Moniteur Scientifique*, half the aluminium at present manufactured is used up in the iron industry. The remainder is largely used in refining nickel and copper. When added to these metals the reduction of the last traces of oxide is completed, the metals become more perfectly fluid, and after cooling can be worked easily. Any alumina formed in this action is completely insoluble in the nickel or copper, and rises to the surface, and thus eliminates itself. The action of aluminium in steel is referred to by the same journal. Rammelsberg found that all the aluminium was used up in deoxidizing, not trace being found in the ingot obtained. At first it was thought that aluminium lowered the melting-point of steel 200° to 300° C., and that its presence caused the great fluidity of the steel. Now the ingots are shown to contain no aluminium. The oxide of iron dissolved in steel renders it less fluid and more brittle, and this

causes it to give off carbon dioxide, hydrogen, and nitrogen.—*Technical World.*

A French technical paper, the *Journal de l'Horlogerie*, declares that a new amalgam has been discovered which is a wonderful substitute for gold. It consists of 94 parts of copper to 6 parts of antimony. The copper is melted and the antimony is then added. Once the two metals are sufficiently fused together, a little magnesium and carbonate of lime are added to increase the density of the material. The product can be drawn, wrought, and soldered, just like gold, which it almost exactly resembles on being polished. Even when exposed to the action of ammoniacal salts or nitrous vapours it preserves its colour. The cost of making it is about a shilling a pound avoirdupois.—*Daily News.*

Fortschritte der Industrie describes an invention of Albert Post, of Halbstadt, Germany, for silvering glass so that it reflects the image when looked at from one side, and when looked at from the other is transparent as ordinary glass. If this be glazed in a dwelling window, for instance, anyone inside can see all that is going on in the street, while anyone looking at the window will see only a mirror light, and nothing inside of it.—*Technical World.*

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*.]
Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 23,853.—Gustav Gaertner, 28, Southampton Buildings, Chancery Lane, London.—Process and appliance for sterilising or pasteurising liquids without any contact with the atmospheric air, and for preserving these liquids in sterilised condition and preventing their motion within the vessels in which they are kept. December 7, 1894.
- No. 23,918.—Thomas James Randolph Clarkson, 23, Coleman Street, London.—Improvements in infants' feeding bottles. December 8, 1894.
- No. 23,914.—Walter Stanley Woodmancy, 23, Coleman Street, London.—A new or improved holder or protector for infants' feeding bottles. December 8, 1894.
- No. 23,931.—James McEwen, 8, Quality Court, Chancery Lane, London.—Improvements in machines for syringing and filling bottles with aerated liquids. December 10, 1894.
- No. 24,020.—Arthur Henry Beckless and William Davenport, Imperial Chambers, Albert Street, Derby.—Improvements in apparatus for measuring liquids. December 11, 1894.
- No. 24,037.—Daniel Livingston Holden, and Lemuel Wright Serrell, 33, Chancery Lane, London.—Improved method of and apparatus for manufacturing ice. December 11, 1894.
- No. 24,049.—James Moore, Joseph Sampson, and Edward Turner Whitelow, 70, Deansgate, Manchester.—Improved substitute for india-rubber and improvements in the process of producing the same. December 11, 1894.
- No. 24,153.—Peter Watson, 56, Low Street, Keighley.—Improvements in liquid strainers. December 12, 1894.
- No. 24,242.—Archibald Welsh and William Muir, 96, Buchanan Street, Glasgow.—A new or improved machine for affixing stamps, labels, and the like. December 13, 1894.
- No. 24,278.—Charles Denton Abel, 28, Southampton Buildings, Chancery Lane, London.—Method and apparatus for the production of metals and other fusible materials in pulverulent form (*Electricitäts-Gesellschaft Gelnhausen mit beschränkter Haftung, Germany*).^{*} December 13, 1894.
- No. 24,284.—James Eskdale, 11, Southampton Buildings, Chancery Lane, London.—An improved device for pre-

venting the unauthorized withdrawal of the corks or stoppers of bottles, decanters, and other receptacles.^{*} December 13, 1894.

- No. 24,291.—Frans August von Alimonda and Nino von Alimonda, 11, Southampton Buildings, Chancery Lane, London.—Improved means for securing the terminal wires to carbon and other electrodes. December 13, 1894.
- No. 24,297.—William McChleary, 154, St. Vincent Street, Glasgow.—An improved porous cell for an electric generator or battery. December 14, 1894.
- No. 24,308.—Thomas Chamings, 7, Hillsborough Avenue, Exeter.—Germ extract. December 14, 1894.
- No. 24,310.—Emile Andreoli, 18, Somerleyton Road, Brixton, London.—Producing disinfectants and antiseptics by ozone.^{*} December 14, 1894.
- No. 24,317.—Peter Stuart Brown and Henry James Stuart Brown, 62, St. Vincent Street, Glasgow.—Improvements in bottles. December 14, 1894.
- No. 24,322.—James Smith, 96, Buchanan Street, Glasgow.—A new or improved compound powder for curing sores or wounds on animals. December 14, 1894.
- No. 24,329.—Frederick Thomas, 169, Piccadilly, London.—A sanitary domestic filter. December 14, 1894.
- No. 24,338.—Fred Taylor Fletcher, 1, Furnival Street, Holborn, London.—Improvements relating to tests. December 14, 1894.

SPECIFICATIONS PUBLISHED DURING JANUARY.

Ergot of rye (J. Y. Johnson, for C. F. Böhringer und Söhne).—The active principle of ergot of rye is obtained as a dull yellow powder of weak acid properties, soluble in ether, acetic ether, chloroform, benzole, and like liquids (sic); almost insoluble in water and insoluble in petroleum ether, "benzine," ligroine, petroleum, and other like liquids, by removing the oil which the ergot of rye contains with petroleum ether, and extracting the active principle from the residue by means of "ether," or the ergot is first treated with "ether," and the evaporated extract treated with petroleum ether until no further precipitation occurs, or dilute alkali is added to the etheral solution, and the aqueous solution so obtained treated with sulphuric, carbonic, or other acid. No. 4097 of 1894.

Hydrogen peroxide (B. Wolfenstein).—Concentrated hydrogen peroxide is prepared from commercial hydroxyl (3 per cent.) by evaporation, either in the open or under reduced pressure, and then distilling the liquid, which contains about 60 per cent. of peroxide, in *vacuo*. At 84° C., and under a pressure of 68 millimetres, hydrogen peroxide of 99 per cent. distils over (see Ph. J., Dec. 29, p. 542). "Chemically pure" peroxide may also be prepared from the above-mentioned 60 per cent. solution by pouring it into ether or other solvent which does not combine with water, and separating the substance thus purified from the ether by subsequent addition of water, or the ether may also be evaporated off and the peroxide distilled in *vacuo*. No. 4423 of 1894.

Bismuth Oxyiodide Gallate (F. Ludy).—This compound is described as a greyish-green amorphous substance, insoluble in water and "ordinary solvents," easily soluble in potash and soda, and slowly decomposed by moist air. It is prepared by digesting freshly precipitated bismuth oxyiodide with gallic acid and water on a water bath or by heating bismuth gallate (*dermatol*) with hydriodic acid, and which is said to be good for treating wounds on account of its "antiseptic and drying properties." No. 22,902 of 1894.

Ammonia Soap (H. Heaton).—A "dry soap" is prepared by mixing petroleum or other mineral oil with ordinary dry soap, and then adding a suitable quantity of ammonium sulphate. No. 23,052 of 1894.

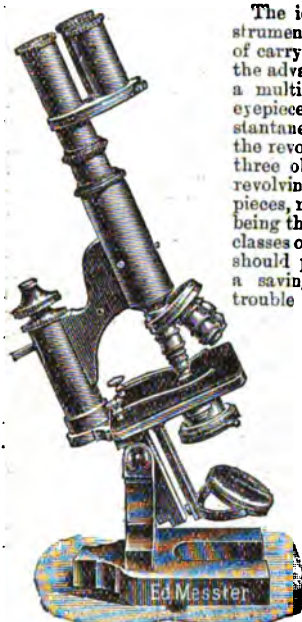
Cellulose and bye-products from wood (C. F. Cross).—Cellulose acetates and oxalates are prepared from wood by treating it with 10 per cent. nitric acid at 80° C., pressing it to expel the liquid, and then treating with weak alkali. No. 409 of 1894.

Condensed milk (H. E. Hansen).—The casein is precipitated from skimmed milk by acid, treated with dilute alkalies, and the previously separated cream gradually added. The resultant mixture is sealed in tins after heating to 118° to 124° C. for an hour. No. 2,626 of 1894.

Novelties.

[Under this heading it is proposed to publish, from time to time, descriptions of new appliances and apparatus, and other novelties of interest to pharmacists. In submitting such articles for notice, full particulars should be sent accompanied, if possible, by a block of suitable size for the Journal columns.]

UNIVERSAL BACTERIA MICROSCOPE.

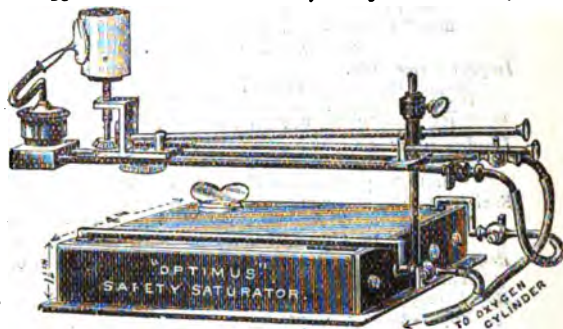


The idea upon which this instrument is constructed is that of carrying to the utmost extent the advantage secured by having a multiplicity of objectives and eyepieces ready to hand for instantaneous use. In addition to the revolving nosepiece, carrying three objectives, there is also a revolving adapter for three eyepieces, nine distinct combinations being thus secured. For certain classes of work this arrangement should prove advantageous, and a saving of much time and trouble be effected. The objectives supplied with the instrument are so adjusted that when once an object is focussed it remains in focus with each of the nine powers. Moreover, by means of the lever behind the micrometer screw, the whole tube can be raised or lowered, and the exact focus is restored directly the lever is released. The instrument is supplied complete with three objectives (Nos. 4 and 7, and

oil-immersion), and three eyepieces for the exceedingly low price of ten pounds. An Abbe condenser and iris diaphragm are supplied if required at a small additional cost.

"OPTIMUS" ETHER SATURATOR.

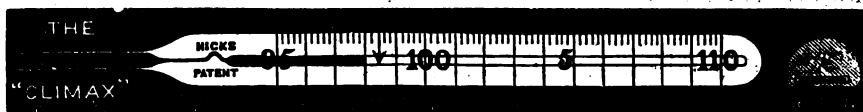
The "Optimus" Safety Ether Saturator for optical lantern illumination, here figured, in which ether takes the place of hydrogen, seems to supply a distinct want. When these ether saturators were first introduced they got rather a bad reputation, on account of the chances of explosion which they presented, but all danger seems here to be avoided. In this apparatus no heat is necessary to vaporise the ether,



nor is there any chance of accumulation of mixed vapour, the gas passing through a narrow canal which is filled with some absorbent material, and being delivered direct to the burner. The pure oxygen tube is entirely distinct from the rest of the apparatus, hence there is no danger from leakage. Complete isolation of the mixed vapour chamber from the burner is effected not only by the ordinary jet taps, but also by one to control the inlet of oxygen and another the outlet of mixed gas. The Saturator is made by Messrs. Perkin, Son, and Rayment, of 99, Hatton Garden.

"CLIMAX" THERMOMETERS.

The principle, adopted by Mr. James J. Hicks, 8, 9, and 10, Hatton Garden, E.C., in the manufacture of the "Climax" Clinical and Chemical Thermometer is a decided improvement. The divisions and figures, instead of being cut on the glass are placed on a separate transparent scale, which is inserted in the body of the thermometer. By this means the readings are always clear and distinct, and the possible accumulation of infectious matter when using the clinical thermometer is avoided. The application of this idea to chemical thermometers does away with the annoyance caused by the black markings on the outer surface of the glass being liable to erasure at high temperatures. The Chemical "Climax" Thermometer can be had graduated on either the Centigrade or Fahrenheit scale.



THE "CLIMAX" CLINICAL AND CHEMICAL THERMOMETER.

THE ENEMA RACK.

This simple and ingenious device has been suggested by the almost universal adoption of india-rubber enema syringes by the medical profession and the public, which makes an improved method of storage a matter of considerable importance. It is introduced by Messrs. Reynolds and Branson, of Leeds, who point out that if syringes are folded and shut up in their boxes, they will suffer more from the tubes remaining bent than from any wear when in use. The Enema Rack, however, suspends Enemas in the only position in which they should be stored, i.e., as represented in the illustration, and provides that proper place for them which is consistent with forethought and good order. The small phial saves any mess from drip, whilst the Rack is made of tinned wire and, being hinged in the middle, folds up for portability. The cost (9d. each) is so small that it is saved in the longer preservation of the Enemas. The agents to the trade in London are Messrs. Hatrick and Co., Snow Hill, E.C.

"OPTIMUS" HAND CAMERA.

A very popular film camera is the one known as the "Optimus" 94, which is also, as the name indicates, made by Perkin, Son, and Rayment, 99, Hatton Garden, E.C. This carries 36 films on celluloid, which are the same as used by all manufacturers, hence no preparation of films before



recharging, is required. The use of aluminium has been adopted to a considerable extent for mounting the "Optimus" cameras, and whilst the weight is of course much lessened, means have been taken to prevent the stability being lessened.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SUNDAY, FEBRUARY 10.

Sunday Lecture Society, at 4 p.m.
"Deep Sea Explorations in their Geological Bearings" (Illustrated), by E. D. Roberts.

MONDAY, FEBRUARY 11.

Imperial Institute.
House Dinner at 6.45 p.m.
"Across Iceland on Horseback" (Illustrated), by the Rev. W. T. McCormick at 8.30 p.m.
London Institution, at 5 p.m.
"Truth and Falsehood as to Electric Currents in the Body," by Professor Vistor Horsley.
Society of Arts, at 4 p.m.
"Means of Verifying Ancient Embroideries and Laces," by Alan S. Cole.
Royal Photographic Society, at 8 p.m.
Annual General Meeting.
Royal Geographical Society, at 8.30 p.m.
Papers to be read:—
"North-west British Guiana," by G. G. Dixon.
"A Journey in German New Guinea," by Capt. Cayley Webster.

TUESDAY, FEBRUARY 12.

Royal Institution of Great Britain, at 8 p.m.
"The Internal Framework of Plants and Animals" (Fifth Lecture), by Professor Charles Stewart.
Royal Colonial Institute, at 8 p.m.
"The Position of British Trade with Oriental Countries," by the Hon. T. H. Whitehead.

WEDNESDAY, FEBRUARY 13.

Pharmaceutical Society of Great Britain.
Library, Museum, School and House Committee.
Evening Meeting at 8.
Junior Pharmacy Ball
Dancing at 9 p.m. at the Portman Rooms.
Imperial Institute.
Concert Dinner at 6.30 p.m.
Smoking Concert at 8.30 p.m.
Concert at 10.15 p.m.
University College (London) Chemical and Physical Society at 5 p.m.
Ordinary Meeting.
Society of Arts at 8 p.m.
"Light Railways," by W. M. Acworth.
Sheffield Pharmaceutical and Chemical Society at 8.30 p.m.
Students' Night.
Manchester Pharmaceutical Association, at 7.30 p.m.
Discussion on the "Pharmacists' Education," opened by W. Kirkby.

THURSDAY, FEBRUARY 14.

Royal Institution of Great Britain, at 8 p.m.
"Meteorites," by L. Fletcher.
Society of Arts (Indian Section), at 4.30 p.m.
"Village Communities in Southern India," by O. Krishna Menon, at the Imperial Institute.
London Institution, at 6 p.m.
"Glass, Antique and Artistic" (Illustrated), by C. F. Binns.
School of Pharmacy Students' Association, at 7 p.m.
"Photography as a Hobby for Chemists," by G. S. Durrant.
"Chemistry in Relation to Agriculture," by S. Bastow.
Chemists' Assistants' Association, at 8.30 p.m.
"Nostrums," by F. C. Long.
Midland Pharmaceutical Association at 8.30 p.m.
"Laboratory Notes," by J. Barclay.
"The Analysis of Sal Volatile," by J. F. Liversedge.

FRIDAY, FEBRUARY 15.

Pharmaceutical Society of Great Britain.
Evening Meeting in Edinburgh, at 8.30.
Royal Institution of Great Britain, at 9 p.m.
"Mountaineering," by Clinton T. Dent.
Geological Society of London.
Annual General Meeting, at 8 p.m.

Annual Dinner at 7.30 p.m.
Quekett Microscopical Club, at 8 p.m.
Annual General Meeting.

SATURDAY, FEBRUARY 16.

Royal Institution of Great Britain, at 3 p.m.
"English Country Songs" (with musical illustrations), by Sir A. C. Mackenzie.

Obituary.

We regret to announce the death from pneumonia and pleurisy, at his home in the Royal Infirmary, Edinburgh, on the 2nd inst., of Charles Arthur Chemist to the Institution and an Associate of the Pharmaceutical Society. Mr. Arthur served his apprenticeship with the late Mr. Gavin Steel, Dunfermline, and came to Edinburgh about twenty-four years ago, when he entered the service of Messrs. Sang and Barker. He was afterwards with Messrs. John Mackay and Co., Edinburgh, then with Messrs. Rankin and Borland, Kilmarnock, subsequently returning to Edinburgh when he entered the employment of Messrs. James Robertson and Co. In 1882 he was appointed Chief Dispenser to the Royal Infirmary, Edinburgh, and held that office until his death. Under his supervision great improvements have been made in the Dispensing Department of the Infirmary, and only very recently extensive alterations and additions have been carried out to admit of aerated waters and various galenic preparations being manufactured on a large scale in the Institution. He had an extensive experience, and was well known as an accomplished practical pharmacist, his assistance and advice having been frequently publicly acknowledged by members of the Infirmary Medical Staff. He contributed useful practical papers on several occasions to evening meetings of the Society in Edinburgh. In 1892 Mr. Arthur compiled a Pharmacopoeia of the Royal Infirmary of Edinburgh, which contained many recipes devised by him at the request of the Medical Staff. He leaves a widow, but no family. He was at the Chemists' Ball on 24th ult., and even on Monday week last was apparently in good health and spirits.

Notice has been received of the death of the following:—

On January 3, William Price, Chemist and Druggist, Hull. (Aged 61).

On January 13, Thomas Pearce, Chemist and Druggist, Gloucester. (Aged 87).

On January 20, Thomas Oates, Chemist and Druggist, South Shields. (Aged 64).

Trade Marks Applied For.

[Compiled from the *Trade Marks Journal*.]

182,188.—BÉRAUDINE, AND DEVICE IN CIRCLE. Preparation of peat for veterinary dressings and for sanitary purposes.—The Peat Industries Syndicate, Limited, 33, Queen Victoria Street, London. November 15, 1894. The essential particular is the device.

182,361.—DEVICE OF AN OBLONG CIRCLE-ENGRAVED LABEL, BEARING FAC-SIMILE SIGNATURE OF THE APPLICANTS. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes.—Thomas Tyrer and Co., Stirling Chemical Works, Abbey Lane, Stratford, London. October 13, 1894. The essential particulars are the combination of devices and the fac-simile signature.

182,189.—BÉRAUDINE, AND DEVICE IN CIRCLE. Medicated preparations of peat for human use.—The Peat Industries Syndicate, Limited, 33, Queen Victoria Street, London. November 15, 1894. The essential particular is the device.

Weekly Drug and Chemical Report.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between these prices and those of the wholesale drug trade.]

THURSDAY, FEBRUARY 7, 1894.

There have been but few changes in the chemical market, since our last issue, prices for most part remaining unaltered. The amount of business done has been very small, and variations have been mostly on the down line. Both citric and tartaric acids remain unchanged at last week's prices, but are in poor demand. Some ammonia compounds are rather easier, the small reduction in sulphate being in company with a fractional one in carbonate, whilst sal ammoniac remains unchanged. Arsenic is quiet at the old rates. A somewhat pronounced change has occurred in cream of tartar, which is very easy at reduced quotations. Mercurials are unchanged, and this applies as well to borax, bleaching powder, and sulphate of copper. Of the potash compounds, yellow prussiate has been very variable. After touching 10½d. last week, it gradually declined until it is fractionally less than last week's closing price. The remaining compounds are steady at last week's rates. Quicksilver is slightly easier. Quinine is steadier at a fractional advance, whilst the previous quotations still hold good for soda compounds. Details—

ACID, BORACIC.—Quotations are: Crystal, 30s.; powdered, 32s.

ACID, CITRIC.—The market is dull at unchanged prices. Still offered at from 1s. 1½d. to 1s. 2d.

ACID, OXALIC.—In fair demand at unchanged rates. Manufacturers quote at 8½d. ex rails.

ACID, TARTARIC.—Although last week's prices are maintained, it can only be taken as indicating that a further decline is unlikely, as the limit would appear to have been reached. Returns:—English, 10½d. to 11d. Foreign, crystals, 10½d.; powder, 10½d.

AMMONIA SALTS.—*Sulphate*: The market is very quiet, prices being a trifle easier. Present quotations: Grey, 24 per cent., £11 7s. 6d. *Carbonate*: Here prices are fractionally reduced, in sympathy with those of sulphate. It is now quoted at 8½d.-8½d. *Sal Ammoniac*: In steady demand at 39s. for first, and 37s. for second quality.

ASHES.—Unaltered. Returns still place *American* at 40s., with pots at 23s.

ARSENIC.—Unchanged. The market is rather quiet still, as the supply is not large, and the quotation, 14s. 9d. to 15s., remains unaltered.

BLEACHING POWDER.—A quiet but steady market, quotations remaining unchanged at 8s. 3d. to 8s. 6d.

BORAX.—The demand continues steady, but the price is unaltered. Crystals are returned at 20s., powder at 21s.

COPPER SULPHATE.—Last week's steady demand has been continued, without, however, causing a rise in prices. It is still worth from £14 15s. to £15 10s., the second quotation being returned for special brands.

CREAM OF TARTAR.—The brisk demand which was noted last week has not been maintained, the supplies being more than equal to the enquiries for it. Fine white crystals are now worth 63s., whilst 65s. is quoted for powdered, in which a depreciation of 1s. 6d. to 2s. is noticeable.

MERCURIALS.—There have been no alterations in the prices here. In quantities up to 28 lbs., calomel is offered at 2s. 9d.; red precipitate, 3s.; white do., 8s.; corrosive sublimate, 2s. 5d.

POTASH COMPOUNDS.—With one exception prices are steady. *Prussiate* has still further declined, and is very quiet in tone. Closing price, 9½d. to 10d. *Chlorate* is quiet but steady at 5d.; *Bichromate*, 4½d. to 4¾d.

QUICKSILVER is quiet at a somewhat lessened quotation, but the reduction is not very material. In first hands the

price is returned as £6 10s.; in second hands it is offered at £6 9s. 6d. to £6 10s.

QUININE SULPHATE.—Although the amount of business done in the best German makes is not of any great amount, still the tone of the market is considerably improved, and quotations are fractionally higher, now reading 11½d. per os. for B. & S. and Brunswick in second hands.

SODA COMPOUNDS.—Steady, at unchanged quotations. *Caustic* is still worth from £3 to £3 10s. for 70 per cent. white, 60 per cent. being quoted at £1 less. *Crystals* unaltered at 38s. *Bicarbonate* also remains at £7 5s. (London).

THURSDAY'S DRUG SALES.

The usual fortnightly sales were held on Thursday. The amount of drugs offered was above the average, but business proved slack, a large proportion being bought in. There were no marked changes in prices, this, however, affording but little indication as to the tone of the market. Details are given below:—

ACACIA.—Only a small amount was offered at the sales, the majority of which was bought in, the reserve in few cases being reached.

ACONITE ROOT.—Three bales of ordinary root were offered, and 36 bags of the Japanese variety, but there were few enquiries for it.

ÆSCULAP WATER.—Twenty cases were offered, containing fifty pint and twenty-five quart bottles, respectively, but were bought in, a solitary bid of 6s. being rejected.

ALOES (Curaçoa).—A parcel of thirty pounds was bought in at 45s. to 55s. Sixteen boxes fetched 40s. to 55s. Another parcel of 200 pounds was bought in at 40s., after a bid of 28s. had been rejected. Five kegs of Socotrine sold at 72s. 6d.

AMBERGRIS.—Only a small amount was offered, the majority of which was withdrawn.

ANACA NUTS.—Thirty-one bags were offered, all of which was withdrawn.

BENZON GUM.—Two cases of Siamese gum sold without reserve; fetched 57s. A large proportion, however, was bought in, prices ranging from 75s. upwards.

BUCHU.—A moderate amount was offered of the long and short variety. A bale of long buchu was bought in at 7d.

CANNABIS INDICA.—All bought in at 3d. to 3½d.

CANTHARIDES.—Eight cases were bought in at 1s.

CARDAMOMS.—A large amount offered and proved in brisk demand. Fine bold white was worth 3s. to 3s. 1d.; medium, 2s. to 2s. 4d.; small, 1s. 9d. to 2s.; poor shrivelled, 1s. 5d.

CASCARA.—Two hundred and fourteen bags were offered. Of these 183 were bought in at 20s. The remainder, consisting of small bark, somewhat broken, was sold to a bid of 20s.

CHIRETTA.—Twenty-four bales offered, which were all disposed of at 1½d. to 1¾d.

CINCHONA.—Four serons gray quill bark sold at 7d. A parcel of forty-eight serons crown bark were all bought in at 8d. to 1s. 2d. Of a parcel of 175 packages yellow bark, mostly damaged, the majority was bought in at prices varying from 4½d. to 10d.

COCA LEAVES.—Fourteen bales were all bought in at 1s. to 1s. 3d.

COPAIBA.—There is but a poor supply. Good quality maranham is worth 1s. 6d. to 1s. 7½d. *Bahia*: Dark to fair, 1s. to 1s. 4d.

CORIANDER.—Of a parcel of 76 bags offered, all were bought in at 15s. 6d. to 17s. 6d. Twenty-five bags of East Indian were also withdrawn at 19s. 6d.

CROTON.—Ten bags were all disposed of at 27s. to 29s.

DRAGON'S BLOOD.—Twenty-four cases offered. Of these nine cases were sold at £6 10s., one block at £5 10s. The majority of the rest was bought in at £5 10s.

ERGOT.—9 bags, sold without reserve at 7d. to 8½d. The majority of that offered was bought in at 10d. to 11d.

EUPHORBUM.—Not asked after at all; 14 serons were bought in at 21s. to 25s.

GAMBOGE.—6 cases were bought in at £10, and another consignment at £10 10s., with pickings at £3 5s., no bid being forthcoming.

GUAIACUM.—All bought in, best quality at 1s. to 1s. 2d.; seconds, 6d.

HONEY.—Fifty cases Californian honey were bought in at 41s.; nine barrels Jamaica. offered without reserve, fetched 20s. 6d. to 41s.; Australian was bought in at 36s.; with Riviera at 40s.

IRISH MOSS.—Two bales bought in at 15s.

IPÊCACUANHA.—Prices are firm, although there is but little doing. Of a parcel of 20 bales offered at to-day's sale the majority were sold at 4s. 1d. to 4s. 4d., the rest being at 4s. 6d. to 4s. 9d. Another lot, partly damaged, fetched 3s. 6d.

JABORANDI.—Two bales of mixed leaves were withdrawn at 10d.

JALAP.—Firmly held, all being bought in at 1s. 4d.

KOLA.—In brisk demand. Three bags medium were bought at 1s. 3d. A case of slightly mouldy nuts fetched 11d.

LIQUORICE.—A parcel of ninety-three bags were bought in at 9s. to 9s. 6d.

MANNA.—Four cases of good bold sold at 2s. 1d.

MENTHOL.—Five cases Cocking's Japan, bought in at 20s.

MORPHINE.—A novelty in the shape of 700 ounces of Indian morphine was offered, but failed to attract a bid.

MUSK.—Ten caddies Tonquin musk were bought in at prices ranging from 35s. to 80s.

OILS (essential).—*Cinnamon*: Four cases offered without reserve, sold at 4½d. to 7½d. The majority offered was bought in at 6d. to 8d. *Bergamot* without reserve, 3s. 1d. *Lemon* without reserve, 3s. 1d. *Orange* without reserve, 2s. 2d. *Eucalyptus*: ten cases (native bean brand), without reserve, sold at 11d.; another lot at 1s. 1d. The majority was brought in peppermint. Five cases Cocking's Japan oil were bought in 8s., after a bid of 6s. 6d.

OILS (fixed) *Castor*.—Thirty cases Italian oil were bought in at 3½d.

ORANGE-Peel.—No demand. All taken out, from 4½d. for dark Maltese to 1s. for bright.

ORRIS ROOT.—Fourteen bags sold without reserve, fetched 66s. to 69s. best quality.

PERU BALSAM.—Bought in at 8s. 3d.

RHEUM.—A large amount offered but no demand, the majority having been bought in.

SAFFRON.—Bought in at 25s.

SANDAL WOOD.—No inquiries.

SARSAPARILLA.—Few inquiries. Three bales *Lima* sold at 10d. to 10½d.; twenty serons *Honduras* bought in at 1s. 2d. to 1s. 4d.

SENNA.—A brisk market for Tinnivelly leaves, of which a good quantity was offered, realising prices from 1½d. to 5½d.

TOLU BALSAM.—Worth 1s. 2d. All bought in at that figure.

VANILLA.—The market was rather slow in tone. Prices ruled from 15s. to 17s. 6d.

WAX.—Largely offered, but only poor business results. White East India was bought in at £8; yellow at £8 15s. to £7; Jamaica at £8 5s.

Photographic Notes.*

Mounting Difficulties.

A few days ago I stepped into an amateur's work-room, and found him sweating over mounting difficulties. The mount laid on the table, carefully pencilled to indicate where the print should come, and my friend was busy at work applying glue to the edges of the print, "so that it would stay where it was placed." Now, there are several reasons why this is a bad procedure. Glue is hard to spread, and sets very quickly, but it also often contains substances injurious to the print, to say nothing of the fact that it soon decomposes and degrades the print. As a mountant, nothing that I know of is better than thick starch for albumen prints, and starch and fine flour for aristo. In making it up I use an aluminium cup, which does not rust, however long the starch may be left in it. A few drops of oil of cloves will preserve it for a week. I always strain the starch through a salt bag, and it should be thick enough to require considerable pres-

* From *Photography*.

sure to force it through. Now the prints are drawn out of the last wash water on to a large pane of glass, and allowed to drain for a few moments. I then take a towel and roll it up compactly, and roll it over my prints, forcing the moisture out, which is absorbed by the towel. This provides a squeegee which is so flexible that it enters every indenture of the uneven pile of prints. It also dries the prints so that they readily take the paste. My paste brush has the bristles set in hard rubber, which holds them securely. The mountant must be thoroughly rubbed into the pores of the paper. Now comes the rub of placing them on the mount. If it is cabinets, you soon accustom yourself to place them just so far from the sides and top, and you mount so near the edge that little difficulty is experienced. In case of plain mounts, 10 × 12 or larger, greater care is needed, as, for the best effects, you must have plenty of margin around your prints. I will mention two methods. Instead of a glass plate place your pin's on oilcloth to receive the paste. This can be readily washed off and rolled up, and laid away when not in use. Now cut a piece of stiff brown paper the size of the mounts to be used, and draw on it in pencil mark an outline the exact size of the print, and just where you will want it on the mount. Now lay the print, face down, on the brown paper inside this outline. The pasted side is up. Stand the mount exactly on the upper edge of the paper, and gradually lower it, and gently press over the print. Now lift up your mount, and the print is in its place. But the better way is to train the eye to the exact measurement of distance. Take up your pasted print and hold it in both hands, being careful not to touch the corners nor the edges. Hold it before you over the mount, about an inch from its surface, note carefully; is it the proper distance from the upper edge, is it parallel with the upper edge, is it equal distance from the two outer edges? If so, gently lower. Should you find a slight mistake, slip the print into place without delay. In the final rubbing down I use a brown, bibulous paper, which can be used over and over again, and does not wrinkle nor curl up. That's all there is of it. Above all, let me say to the amateur, train the eye, fight clear of makeshifts. Photography should become more and more a thing of yourself. A trained eye, a trained hand, and brain and soul even, for I believe that is where the feeling of art resides. Your photography will bless you in proportion as it makes you more perfect.—J. H. BATES.

Exchange.

OFFERED.

BOOKS.—'Edinburgh Dispensary,' 1810; 'London Dispensary,' 1826; 'Cooper's Dictionary,' 1812; 'Culpeper's Herbal,' coloured plates (soiled); 'Milton's Spermatorrhoea,' 3s. 6d. each (postage extra); Twelve yards corrugated paper. 2s.—Chalmers, Clifton Dispensary, Bristol.

RECIPES, 180 well-tryed, general, remedial, veterinary, toilet, and every-day preparations, neatly copied in book. Post free, 1s. 6d., or exchange patents or books.—Tully, chemist, Hastings.

MATERIA MEDICA CABINET (Evans, Leecher and Webb's), good as new. Cost £3 2s., take £1 1s.—Wood, 151, Westbourne Terrace, Hyde Park, W.

UNDERWOOD'S SPHINX HAND CAMERA, cost £3 15s., fitted with all latest improvements; sell £3 10s., or part exchange taken in books suitable for "Minor."—Louis Wells, Armsley, Leeds.

WANTED.

BOTANICAL INSTRUMENTS AND APPARATUS, also good microscope.—Radix, Louth, Lincs.

TOOTH-STOPPING INSTRUMENTS.—Modern, by good maker. Cheap.—Approval to W. Hindle, Chemist, Gorleston, Great Yarmouth.

Notes.

THE LATE S. M. BURROUGHS.—At a meeting of the Council of the British and Foreign Arbitration Association held on February 8, the following resolution was adopted:—"The Council of this Association desires to record its sincere regret at the premature death in the prime of his usefulness of Mr. S. M. Burroughs (of the firm of Messrs. Burroughs and Wellcome), whose interest in, and increasing devotion to, the cause of international arbitration and peace for many years, and in many directions, merits from this and other kindred associations a cordial recognition." Mr. Henry S. Wellcome desires, on behalf of himself and the employees of his firm, to express to the trade generally their warmest thanks for the numerous letters of sympathy received on the occasion of Mr. Burroughs' decease.

PRACTICAL MANUAL ON PHARMACY AND OTHER ACTS.—Mr. F. J. Rebman, 11, Adam Street, Strand, announces the early publication of a book on 'The Law and Chemistry of Food and Drugs,' by H. Mansfield Robinson, LL.D. (Lond.), Solicitor and Clerk to the Shoreditch Sanitary Authority, etc., and Cecil H. Cribb, B.Sc. (Lond.), F.I.C., Public Analyst to the Strand District Board of Works, etc. The work is described as a practical manual on the Sale of Food and Drugs Acts, 1875 and 1879; the Margarine Act, 1887; the Pharmacy Acts, 1852 and 1868; the Bread Act, 1836; the Fertilisers and Feeding Stuffs Act, 1893; the Inland Revenue Acts, and other Statutes relating to Adulteration. It will also treat of so much of the Public Health Acts as relates to unsound food. All recent decisions on the Acts will be dealt with, and practical hints will be given to traders and inspectors as to the execution of the Acts, with so much of the chemistry of articles of food and drugs as is requisite in conducting or defending prosecutions. Crown 8vo. 6s. About 400 pp.

PERSONATION CASE AT GLASGOW.—In the report of the decision in this case (see p. 47) it will be noted that the Sheriff commented on what he characterised as "the mistaken and unfair policy of the officials of the Pharmaceutical Society" in withholding certain "facilities." The only matters which the Society's officials were asked to produce were the examination papers supposed to be written by Conner, and the visitors' book from York Place. The former had been destroyed long ago, and information was given to that effect, whilst Mr. Rutherford Hill was present in court with the visitors' book. It is difficult, therefore, to understand what Sheriff Henderson Begg could have referred to.

THE OXFORD BOTANIC GARDEN.—The income, by which hitherto the Botanic Garden at Oxford has been maintained by the curators from endowments, has recently fallen off, owing to agricultural depression; and it is proposed that the deficit shall be made up out of the university chest.

PHARMACOPŒIA COMMITTEE IN EDINBURGH.—Dr. W. Inglis Clark has been asked by the College of Physicians, Edinburgh, to join Professor Fraser and Dr. Ralph Stockman in constituting a Committee on the proposed revision of the British Pharmacopœia.

DIPHTHERIA ANTITOXIN.—Messrs. Allen and Hanburys (Limited), London, have been appointed special agents for the supply of diphtheria antitoxin prepared by the British Institute of Preventive Medicine. They also manufacture a syringe for injecting the serum, which has been approved by Dr. Ruffer, Director of the Institute.

UNIVERSITY OF LONDON.—In the House of Commons on Tuesday, Mr. Acland informed Sir A. Rollit that the Government proposed shortly to introduce the Bill with reference to the University of London in the House of Lords.

COD LIVER OIL AND CHEMISTRY.—This is the title of a handsome work by Dr. F. Peckel Möller, who has endeavoured to bring before pharmacists and medical men the main facts concerning cod liver oil. It is shown how the fats of this oil differ from other fats, and light is thrown on the pharmacological action and therapeutic possibilities of the former. The pharmacy of cod liver oil is also treated of, and a summary given of the literature of the subject, besides descriptive sketches of the places where it is made, the people who make it, the methods of manufacture, etc., etc.

LONDON MEDICAL DIRECTORY.—The volume for the current year is the seventh issue of this useful work. It contains twenty-four pages more than last year, the increase in bulk being due, as formerly, to the constant addition of fresh societies, publications, and institutions, as well as to greater accuracy of detail in the information given. As an efficient and useful guide and handbook, therefore, the Directory ought to be in greater demand than ever.

PHARMACEUTICAL SOCIETY OF IRELAND.—In the new Calendar of this Society, corrected up to December 31, 1894, the number of Irish Pharmaceutical Chemists is given as 468, members of the Society 188, Chemists and Druggists 309, Registered Druggists 351, Associate Druggists 125.

NAVAL DISPENSERS.—On Tuesday last Lord Spencer received a deputation of Irish members of Parliament on the subject of the appointment of pharmacutists by the naval authorities. It was complained that the authorities refuse to recognise the certificate or licence of the Irish Pharmaceutical Society, and the First Lord of the Admiralty undertook to endeavour to bring about the rescinding of the Order in Council regulating the matter, in favour of one which would meet the wishes of the deputation.

THE METRIC SYSTEM.—On the motion of Sir A. Rollit, a Select Committee was appointed by the House of Commons, on Wednesday, to inquire whether any and what changes in the present system of weights and measures should be adopted

Miscellaneous News.

FUNERAL OF MR. S. M. BURROUGHS.—The funeral of the late S. M. Burroughs took place at Monte Carlo on Friday, the 8th inst. A special memorial service was held the same afternoon at the parish church, Dartford, and was attended by Mr. H. S. Wellcome, the partner of the deceased gentlemen, and by Mr. Sudloe, Mr. Kirby, and the various members of the staff from Snow Hill Buildings and Dartford. The church was crowded in every part, and the congregation included many well-known members of the trade and personal friends who were anxious to render a last tribute of esteem and respect to the memory of this widely-known and popular man, who, on account of his many sterling qualities, will not easily be forgotten. The Vicar of Dartford, in the course of an eloquent address, alluded to the Dartford Cottage Hospital, which owes its existence to Mr. Burroughs' philanthropy, and to which he had contributed another large donation a short time before his death.

THE LATE S. M. BURROUGHS.—A meeting was held at the Cannon Street Hotel, on Tuesday, the 12th inst., to consider the question of raising a memorial to the late Mr. Burroughs. There was a large and representative attendance of those interested in the subject, including, besides several prominent pharmacists, members of the medical and literary professions. Mr. Michael Carteighe was voted to the chair, and in the course of a few sympathetic remarks explained the object of the meeting. He called upon Mr. H. Helbing to read the preliminary list of subscribers and state his views in respect to a suitable form for the memorial to take. Mr. Helbing announced that over £300 had been already promised, and he did not doubt that £1000 or even £2000 could be subscribed. Bearing in mind how Mr. Burroughs' sympathies had always been on the side of pharmaceutical education, he was of opinion that the most appropriate form of memorial would be the endowment of a scholarship to be called the "Burroughs' Memorial Scholarship" on the lines of the Jacob Bell Memorial Scholarship.

Mr. A. C. Wootton, who followed, made a suggestion to the effect that if the interest arising from the sum were distributed each year amongst the five oldest annuitants of the Pharmaceutical Society's Benevolent Fund, it would be perpetuating the deceased's memory in a manner most in accordance with his charitable instincts.

Mr. Radford thought it would be best to defer for the present any final decision as to the form which the memorial should take. For the present the main point was to get as many subscriptions as possible, it would then be time enough to determine the use it should be put to.

Messrs. P. MacEwan and H. W. Idris, L.C.C., were also in favour of leaving over for the present the manner in which the fund raised was to be employed. In the course of a lengthy discussion, in which Messrs. J. Moss, Frank Smith, Wallace, Fletcher, Gerrard, Somerville, and Drs. Passmore and Gubdt took part, abundant evidence was afforded of the esteem and affection in which Mr. Burroughs was held by all who came in contact with him, and it was finally decided to appoint an Executive Committee, with all those present at the meeting as a general committee. The Executive Committee was appointed as follows: Messrs. Carteighe, Frank Smith, L.C.C., Radford, Wootton, Helbing (Secretary), and J. Moss (Treasurer). Subscriptions may be sent to the Treasurer, 39, Tressillian Road, St. Johns, S.E.

Letters and telegrams of apology and sympathy were

read from Messrs. T. P. O'Connor, M.P., Wellcome, and Richards. In the course of the discussion it transpired that the employés of Messrs. Burroughs, Wellcome and Company were themselves raising a fund having a similar object. The general meeting was concluded by a vote of thanks to Mr. Carteighe.

CHEMIST AND DRUGGIST SOCIETY OF IRELAND.—The committee meeting of this Society was held on Feb. 4, at eleven o'clock, in the offices, North St., Belfast.—Mr. John H. Shaw in the chair, and subsequently Sir James H. Haslett, J.P., President. Present also:—John Campbell, Jacob Walsh, A. R. Hogg, John Cairns, S. Gibson (hon. treasurer), and W. J. Rankin (hon. secretary). The minutes of the previous evening were read and adopted. Mr. Gibson reported that nineteen members had sent their subscriptions since previous meeting, and submitted a list of members and other druggists not connected with the Society. After consideration of same it was resolved to divide the list into districts, and the Committee to wait on the various travellers and endeavour to enlist their co-operation. The President reported having received a letter from Mr. Turkington Cookstown (one of the vice-presidents of the Society, who is also a member of the Pharmaceutical Council). The writer asked their views on the question of limited companies dispensing prescriptions, as that question was to come before the Council at their meeting to-morrow (Wednesday). Mr. Gibson reported that he hoped to attend the meeting on Wednesday also. The President fully explained the points at issue; and after considerable discussion Mr. Gibson was asked to represent their views, and endeavour to have a conference between representatives of the Pharmaceutical Council and members of their Committee to discuss this question and others of great importance to both bodies. The President intimated he was glad to see the members taking an interest in these matters, and thanked them for their attendance, after which the Committee adjourned.—*Northern Whig.*

ALLEGED ILLEGAL SALE OF PRUSSIC ACID.—At the recent Chesterfield County Petty Sessions, Thomas Henry Bradley,* chemist, was charged with unlawfully selling at Whittington Moor, on January 13, to Albert Wallace Belfitt, grocer's assistant, prussic acid, the said Albert Wallace Belfitt being a person unknown to him, and not being introduced by some person known to him.—Mr. Walker, of Chesterfield, appeared for the defendant.—Daisy Lowndes, a girl 16 years of age, living at Whittington, said she was in the shop when Belfitt was in. She signed her name in the poison book, and the signature produced was hers. She was asked by Mr. Bradley to sign her name, and Belfitt was there at the time buying the poison, which he said was for a dog. She had never seen Belfitt before. She could have read what was over her signature, but did not. She had known Mr. Bradley some time, and he would know her name. She heard part of the conversation in the shop. She did not tell Mr. Bradley whether she knew Belfitt or not.—The Magistrate's Clerk (Mr. Humble): I don't think you need cross-examine her on that; the Act says "known to the seller."—Witness, continuing, said she lived within three minutes' walk of Belfitt's house.—James Dunn said he went into the shop while Belfitt was there. Belfitt asked for some poison to destroy a dog with. Mr. Bradley objected, saying they did not like to let that stuff go out of their presence; indeed they preferred in all cases to administer

* This name does not appear on the Register of Chemists and Druggists for 1895.

it themselves. Mr. Bradley asked him if he knew Mr. Walker, and he replied "Do you mean Lawyer Walker," and when Mr. Bradley said "No, his father?" Belfitt said he did. Mr. Bradley then said Mr. Walker would be coming down the following day and Belfitt must come down then and bring the dog. Belfitt said it was a long way to come again, and threw down a shilling on the counter, remarking "You need not be afraid of me having this poison; don't think I want to take it myself, as I am too fond of having a drop of booze."—Mr. Walker rose to cross-examine the witness, but the Chairman of the Bench (Mr. E. W. Barnes) said he did not think he need cross-examine the witness as the Bench were of opinion there was no case under the Act. They wished also to say the police had done perfectly right in bringing the case into court, as cases of that kind required to be very carefully dealt with.—*Derbyshire Courier*.

LEGUMINOUS PLANTS IN ABERDEENSHIRE.—A correspondent of *Science Gossip* remarks that it is of value to notice that the sulphur-coloured trefoil (*Trifolium ochroleucum*), has acclimatised itself in Monymusk, in the Don Valley. This has evidently been the result of being introduced among agricultural seeds. When I saw plants of it there several years ago, they were in flower in the month of July, and had evidently thoroughly established themselves. While hop trefoil (*Trifolium procumbens*) at one time only occurred at the outside of its limits, when its seeds were introduced among agricultural seeds, it is now supporting itself in some parts by the seeds of the local-grown plants, producing plants, being an advance from the time when the seeds did not mature sufficiently to germinate or at least strong enough to produce plants. The common vetch (*Vicia sativa*), which has always been occasionally met with here on agricultural fields, has of recent years established itself in manner similar to the last-mentioned, along various tracts of the Valley of the Don, where its attractive flowers adorn the landscape among the other flowering plants. He has been unable to find large birds-foot trefoil (*Lotus major*, Scop.), in Alford, where it was once found, although he has seen it in Midmar, nearer the sea coast, growing on damp pasture. Birds-foot trefoil (*Lotus corniculatus*) has not been so abundant here for some years as it once was, but perhaps the increase of any particular class of animals might cause this for some seasons, which might just revert to the former quantity during the next few years, or there might be a permanent decrease.

PRACTICAL CHEMISTRY SYNOPSIS OF THE CONJOINT EXAMINING BOARD.—The Examining Board in England of the Royal College of Physicians of London and the Royal College of Surgeons of England gives notice that the following revised synopsis of the Examination in Practical Chemistry will come into force and will apply to all Candidates on and after October, 1894:—

Identification of substances included in the following lists:—

INORGANIC.

Metals.—Sodium, potassium, ammonium, calcium, barium, magnesium, zinc, iron, aluminium, copper, silver, lead, mercury, bismuth, antimony, arsenic.

Acids.—Hydrochloric, hydrobromic, hydriodic, nitric, carbonic, sulphuric, phosphoric.

The metals may be present as metal, oxide, sulphide, or as a simple salt. The acids hydrochloric, nitric, sulphuric may be present in the free state.

ORGANIC.

Acetic, oxalic, tartaric and hydrocyanic acids, and their salts with potassium, sodium, and ammonium. Cane and grape sugars. Urea.

Candidates will be required to give equations illustrating the chemical reactions involved in testing for the above substances, and, if requested, to explain the same.

Preparation of one of the following compounds:—

Chloride of sodium, of ammonium, or of lead.

Iodide of lead or of mercury.

Oxide of copper or of mercury.

Hydroxide of sodium or of copper.

Carbonate of sodium, of calcium, of magnesium, or of bismuth.

Oxalate of ammonium.

Oxalate of urea.

Nitrate of potassium, of barium, or of lead.

Phosphate of calcium or of iron.

Sulphate of sodium, of calcium, of magnesium, of zinc, or of copper.

Candidates will be required to exhibit to the Examiners the preparations which they have made, and to represent by equations the reactions involved.

PROTYLIC PHARMACY.—Mr. J. J. Brown, chemist and druggist, Glasgow, writes stating that "the feeling is abroad amongst philosophic scientists that all the chemical elements, the luminiferous ether, etc., are but different densities of one essential substance. That is, that substance (or *protyle*, as Crookes calls it) is diluted in space into different densities, which different densities are the elements. That, then being so, essential substance must be that which is conscious, for there is nothing else to be conscious." To this communication he appends a printed card as follows:—

POISON.

IN LARGE DOZES.

THE ETERNAL NEWS.

Edition for (1st January, 1901) the 20th Century
NOW READY.

Highly Recommended by Dr. ALFRED RUSSEL WALLACE
LL.D., F.R.S., etc., the Father of Darwinism, and One of the
Foremost Scientists of the Age.

"THE ETERNAL NEWS" proves that SUBSTANCE is actually CONSCIOUS and is therefore SPIRIT; and that SUBSTANCE by its WILL-action creates FORCE and MOTION; and that the various forms in nature, such as stars, clouds, hills, stones, wood, atoms, etc., are but mere SHAPES into which the EVERLASTING, CONSCIOUS SUBSTANCE throws itself. "THE ETERNAL NEWS" sets forth in simple words (as complex words give opportunity for mental jugglery) that BEING actually is; that outside TIME, SPACE, SUBSTANCE, MOTION, and SHAPES nought is; that TIME, SPACE and SUBSTANCE could never have begun to be and can never cease to be; but that MOTION and SHAPES may begin to be and may cease to be. That SUBSTANCE is the THAT that is CONSCIOUS; that AT WILL, SUBSTANCE moves itself thus and creates MOTION; and that AT WILL, SUBSTANCE holds itself together in multitudinous, various SHAPES, which SHAPES constitute the CREATION. And the argument is that BEING or EXISTENCE is unthinkable otherwise.

"THE ETERNAL NEWS" is to be had by post, for 12 penny stamps from the author, J. J. BROWN, 300, Cathcart Road, Glasgow, Scotland.

Please preserve this Post Card for further consideration, the hand is on to your Scientific and Philosophic Neighbours.

J. J. B.

CASE OF ALLEGED PERSONATION.—At Greenock Sheriff Court on February 6, Sheriff Henderson Begg gave decision in an action in which John Conner, druggist's assistant, 39, Bank Street, Greenock, sued Dr. William Cairns, Greenock, for £500 damages as slander. Pursuer stated in his condescendence that he was 23 years of age, and was assistant in the shop at 38, East Hamilton Street, belonging to Dr. Lawrie,

where messages were received for defender, who had also the use of a room in said shop for consultation. Defender had accused him of having got a young man, named Frank Lambie, to personate him and sit for him at his Preliminary examination of the Pharmaceutical Society at Edinburgh in January, 1892. Pursuer maintained that he passed the examination in question, and as his employer had threatened to dismiss him unless the matter was satisfactorily cleared up, he had brought the action for the purpose of vindicating his character. Defender pleaded *veritas*. His lordship heard evidence at great length a few days ago, and yesterday issued an interlocutor, in which he finds for defender, with expenses. In a note, his lordship says the defender has certainly laid upon himself a heavy *onus* in undertaking to prove the truth of the ill report which for personal reasons he took up against the pursuer three months ago, and which he has repeated in his defences, and the *onus* had in his opinion been augmented by what he must characterise as the mistaken and unfair policy of the officials of the Pharmaceutical Society in withholding from the pursuer's agent facilities which they granted to the defender's agent for ascertaining facts affecting a right decision of their case. Moreover, to the pursuer an adverse decision must be fraught with such serious consequences that the Sheriff would willingly give him the benefit of any reasonable doubt, but he was constrained by the evidence to return a verdict in favour of defender. It was admitted by Lambie that, having quarrelled with the pursuer some months after the Preliminary examination, he told some of his companions that he passed the pursuer's examination, and notwithstanding the gloss which he now seeks to put upon these words it was proved that his companions understood them in their natural sense—namely, as meaning that he had passed the examination instead of the pursuer. Indeed, the details given by one of those companions (Archibald Taylor) showed that Lambie revealed to him the whole plot, and corroborated the evidence of Alexander N. Bowman ("the fellow from Kirkcaldy"). One passage in Lambie's testimony seemed to afford some ground for believing that he would have made a clean breast of the matter in the witness-box if he could only have got a sufficient guarantee against subsequent proceedings against him. Unless the witnesses for the defence had, without any intelligible motive, conspired to say what was not true, it was clear that Lambie and not the pursuer passed the examination in question.—*North British Daily Mail*.

Press Comments.

REVOCATIONS OF PATENTS.—More patents have been revoked this year than in any year since the new Act came into force. A batch of four patents was revoked at the instance of the Pharmaceutical Society on the ground of no subject-matter. These patents were for medicinal compounds, and were in the names of Rendell, Vaisey, Kay, and Wilkinson. It is needless to add that the mere compounding or mixing of known ingredients stands on a totally different footing from a new chemical process or a new chemical product.—*Commerce*.

WEIGHTS AND MEASURES ACT.—The verification and stamping of weights and measures have become under the officials of the Council a very comprehensive business. Offices have been provided in suitable London districts, and more than seventy officials have been employed to carry out this testing work. The number seems large in the aggregate, but spread over London it is relatively small. It aids, however, to

swell the total of County Council officials against which the Reactionaries, or Moderates, have been crying out. But look at what the men employed in this testing department have done. Last year they tested more than a million instruments used for weighing and measuring, and found nearly a quarter of a million to be unjust. They paid many thousand surprise visits to such places as markets, stalls, shops, and stores, testing the scales, weights, and measures used in the sale of food and other commodities. As a result of these visits, to say nothing of the work above spoken of, they discovered nearly a thousand "unjust" cases. Of the offenders the greater number were cautioned, but three hundred were prosecuted, and nearly all these were convicted. That is work in which all London is interested, and though it is often unseen, it means an ultimate and substantial gain to the ratepayer.—*Daily News*.

'TRUTH' ABOUT ANTISEPTIC FOOT POWDER.—I have to thank a great many chemists in different parts of the Kingdom, who, having seen a reference in *Truth* to an "antiseptic foot-powder" (see Supp., p. 28), have sent me recipes for the manufacture of such an article. Several of them assure me that their compositions are more or less identical with the one to which I referred, and one or two give me formulas for powders—foot-powders, of course—in use in Continental Armies. As they all seem to be as nearly as possible identical with one another, I can readily believe these statements, but why they have not all received testimonials as gratifying as the one already noticed from the Adjutant-General I am quite unable to comprehend.—*Truth*.

PROPOSED MEMORIAL TO SIR HENRY ACLAND.—A decidedly ungracious controversy has arisen at Oxford over the contemplated memorial to Sir Henry Acland. The extension of the Acland House was generally regarded as the best testimonial to the late Regius Professor of Medicine, and that was the form most acceptable to himself. Now, however, Professor Ray Lankester has come forward with a proposal that the memorial shall be for the benefit of the Museum. Whatever may be the ultimate issue of the dispute it is sure to exercise a prejudicial effect on whichever scheme is selected.—*Truth*.

SPECIFIC FOR DROPSY.—A certain Hans Weber, of Stettin, sells and advertises largely a powder which, it is claimed, will cure dropsy. This marvellous specific, offered with medical recommendations and numerous testimonials of cures, is sold at a price which amounts to £5 a pound. Dr. Hoffman, of Stettin, bought some of this secret remedy, and had it analysed by the director of the laboratory of analysis at Darmstadt. The director found that the powder was composed, chemically, one-half of carbonate of lime, 12 per cent. of carbonate of potash, with variable portions of coal, clay, phosphate of lime, magnesia, and some other things, the whole from a chemical point of view being simply cigar ashes.—*Mascot*.

PHYSIC IN INDIA AND AT HOME.—Poor physicked Humanity! Dr. George Watt is quite concerned because the native Indian Hakims use at least double as many drugs as their English bolus-bearing brethren, and he wants more of them brought here for the benefit of Indian trade and the English valetudinarian. What happy times are before us for the medical papers and the testimonial-giving doctors! When Mrs. Besant has persuaded us to adopt Hinduism as a religion, and Dr. Watt, like another busy bee, has induced us to gather nastiness from every Indian flower, our souls and bodies will doubtless be all the better here and hereafter.—*Weekly Times and Echo*.

Poisoning Cases and Inquests.

Arsenic.—Lydia Antill Goodall, aged 22, died on Sunday, January 27, at South Hayling, from the effects of arsenic contained in rat poison, self-administered. Verdict: "Suicide whilst of unsound mind."—*Portsmouth Times*.

Chloral Hydrate.—Thomas Stanley, aged 53, died at his residence in Hylton Road, Worcester, on Tuesday, January 29, from the effects of chloral hydrate, self-administered. Verdict: "Suicide whilst temporarily insane."—*Worcester Advertiser*.

Opium.—On Monday, February 4, an inquest was held at the Crown Inn, Wootton Bassett, on the body of an unknown man, who died on Sunday, February 3, evidently from the effects of opium, a bottle containing opium from which a dose had apparently been taken being found near. The coroner adjourned the inquiry.—*Western Daily Press*.

Nitric Acid and Quicksilver.—A shocking death through accidental poisoning was reported to the Bolton coroner on Friday, February 8. Isabella Madden, aged 44, wife of an umbrella hawker, took up a bottle which she thought contained whisky, and drank the contents. The liquid proved to be a mixture of nitric acid and quicksilver, and, notwithstanding medical skill, deceased died from the effects of the draught.—*Manchester Evening News*.

Oxalic Acid.—Edward Stares, a lance-corporal and tailor of the Hants Depôt, died on Wednesday, February 6, at Winchester, from the effects of oxalic acid, self-administered. Verdict: "Suicide whilst temporarily insane."—*Southampton Echo*.

Carbolic Acid.—Alexandrina Clive, aged 26, died on Wednesday, February 6, in the Royal Infirmary, Manchester, from the effects of carbolic acid, self-administered. Verdict: "Deceased committed suicide whilst insane."—*Manchester Evening News*.

Poisonous Liniment.—John Clarke, aged 48, died on Friday, February 8, at his residence, 2, Preston's Avenue, Gilda Brook, Eccles, from the effects of a poisonous liniment administered by his wife in mistake for his medicine. Verdict: "Death from misadventure, and the jury also recommended that poisonous liniments should be put up in bottles having a shape distinct from those containing non-poisonous medicines, and approved of a new poison alarm signal, to be attached to poison bottles shown to them by the coroner."—*Manchester Evening News*.

Strychnine.—Gilbert Hughes Davies, aged 24, clerk in holy orders, died on Friday, February 8, at Spencer Road, Wandsworth Common, from the effects of strychnine, self-administered. Verdict: "Suicide whilst of unsound mind."—*Echo*.

Prussic Acid.—Alfred Clifton James, chemist's assistant, aged 20, died on Friday, February 8, at Dover, from the effects of prussic acid, self-administered. Verdict: "Suicide while temporarily insane."—*Dover Telegraph*.

Obituary.

S. M. BURROUGHS.

In our last issue we announced with regret the death of Mr. S. M. Burroughs, of the firm of Burroughs, Wellcome and Co., at Monte Carlo. It seems that Mr. Burroughs caught a severe cold in December last, and in order to recruit his health, and at the same time to visit his sister, Mrs. Rix, went to the Riviera. He had practically recovered from his cold, and was apparently in excellent health, when, whilst out cycling in the neighbourhood with his sister on the 2nd inst., he contracted a severe chill, on account of not being sufficiently clothed. The chill developed into pleurisy, which was followed on the Monday evening by pneumonia. Still, it was not until the Tuesday afternoon that Dr. Fagge, who attended him, apprehended any danger; even then, although Mrs. Burroughs was advised by cable to come from their home at Surbiton, it was not thought that there was any immediate danger. However, the progress of the malady was so rapid that he passed away early on Wednesday morning. He was perfectly conscious until the last, and although in some pain at first, the end was quite painless. Mrs. Burroughs arrived too late to see him before his death, but was met at Marseilles by Mrs. Naftel, who broke the sad news to her. The burial service took place on the 8th inst., in the Protestant part of the Monte Carlo cemetery. The relatives of the deceased acknowledge the kindness they received on all hands at Monte Carlo, and especially from Mr. Crucelle and Mr. Naftel, pharmacists of Monte Carlo; Mrs. Calle, of Monte Carlo, and Mr. and Mrs. Squire, of San Remo. Mr. Burroughs' great generosity was well known to pharmacists. He was a liberal contributor to the Benevolent Fund of the Pharmaceutical Society, and recently he endowed the Dartford Cottage Hospital with £1000. Educational movements always had his sympathies, many associations throughout the country having benefited by prizes offered by the firm of which he was a member, and at social gatherings connected with pharmacy he was a regular patron and frequent attendant.

Notice has also been received of the death of the following:—

On December 31, Andrew Fraser, Chemist and Druggist, Durban, South Africa. (Aged 44.) Mr. Fraser had been an Associate of the Pharmaceutical Society since 1870.

On January 19, James Binnie, Chemist and Druggist, Edinburgh. (Aged 51.)

On January 28, George Edmonds, Chemist and Druggist, late of Kensington. (Aged 52.)

On February 4, Henry V. Baker, Chemist and Druggist, late of Wimborne. (Aged 54.)

On February 9, John Stanley Ormandy, Chemist and Druggist, Walton. (Aged 54.) Mr. Ormandy had been a Member of the Pharmaceutical Society since 1875. He was also Justice of the Peace and Councillor for the borough of Barrow-in-Furness.

Publications Received.

COD LIVER OIL AND CHEMISTRY. By F. P. MÖLLER, Ph.D. Pp. 508. London: Peter Möller, 43, Snow Hill, E.C. From the Author.

KELLY'S LONDON MEDICAL DIRECTORY FOR 1895. Pp. 496. 6s. 6d. London: Kelly and Co., Limited. From the Publishers.

CALENDAR OF THE PHARMACEUTICAL SOCIETY OF IRELAND FOR 1895. Pp. 197. 1s. 6d. Dublin: Charles Chambers. From the Society.

Novelties.

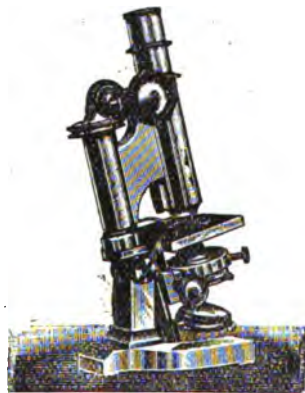
[Under this heading it is proposed to publish, from time to time, descriptions of new appliances and apparatus, and other novelties of interest to pharmacists. In submitting such articles for notice, full particulars should be sent accompanied, if possible, by a block of suitable size for the Journal columns.]

NEW MICROSCOPES.

The "Star" Microscopes of Messrs. R. and J. Beck, Ltd., 68, Cornhill, have recently been considerably improved in style, and received a very neat addition in the shape of a focussing and swinging substage, carrying an Abbe form of condenser with an Iris diaphragm, as figured below. The price of this piece of apparatus is 30s. The other illustration shows the "Improved Continental" Model



Microscope, by the same makers. This seems to be a very compact and serviceable instrument. It is built perfectly solid, thus avoiding the use of packing pieces to keep it rigid. The large square stage allows of the examination of culture plates and dishes, and upon removing



the stage clips, the new form of mechanical stage can be attached in a few seconds. The fine adjustment of this instrument is exceedingly delicate in action. Further particulars can be obtained from Messrs. Beck's new 60 pp. catalogue, which appears to justify its description, as being a complete dictionary up to date of instruments and apparatus used in microscopy.

UNIVERSAL BACTERIA MICROSCOPE.

In describing this new instrument last week (Supp. p. 41), it should have been stated that the available magnifying power ranged from 40 to 1500 diameters, and a cylinder diaphragm, an Abbe condenser, and a mahogany case for the microscope were included in the price—£10. An Iris diaphragm or a larger Abbe condenser can be fitted at extra cost, if required. The inventor and

maker of the instrument, Ed. Meester, Westend bei Berlin, Germany, has endeavoured to specially adapt it to the needs of physicians, pharmacists, and others who may have frequent occasion to use a microscope for the examination of urine, sputum, etc., and only a limited time to devote to the purpose.

NEW VIEW FINDER AND LEVEL.

The two illustrations show combinations of the View Finder and Level for use with Camera, made by M.



J. J. Hicks, Hatton Garden, E.C. They are supplied in different sizes, and variously modified to suit different cameras. They appear to effect a saving of time, and ensure greater accuracy.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*. Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 163.—George Edward Heyl, 23, Southampton Buildings, Chancery Lane, London.—An improved preparation for antiseptic and antifermentive purposes for medical and other use. January 2, 1895.
- No. 164.—George Edward Heyl, 23, Southampton Buildings, Chancery Lane, London.—A preparation for the cure or prevention of sea sickness. January 2, 1895.
- No. 210.—Frederic O'Connor Prince, 37, Cursitor Street, Chancery Lane, London.—An improved medicinal compound. (R. Chambers, New Zealand.) January 1, 1895.
- No. 417.—William Mallmann, 45, Southampton Buildings, Chancery Lane, London.*—An improved manufacture of musk-like substances. January 7, 1895.
- No. 420.—Birt Acres, Clovelly Cottage, Barnet, Herts.—Improved form of photographic plate-holder and camera for same. January 7, 1895.
- No. 458.—Frederick William Fames and Hubert Cressy, 30, Perth Road, Finsbury Park, London.—A new apparatus for rapidly cooling sugar or analogous material in a liquid form. January 8, 1895.
- No. 518.—Wenzel Teddlitzky, 77, Chancery Lane, London.—Medicinal tablets or cakes for addition to bath. January 8, 1895.
- No. 553.—Humphrey Humphreys, 4, Corporation Street, Manchester.—Improvements in sanitary towels. January 9, 1895.
- No. 593.—Bruno Mennig and Max Jahn, 5, Hatton Garden, London.—A spray-producer or atomiser for perfumes and other liquids. January 9, 1895.
- No. 629.—John Fred Davies, 23, Coleman Street, London.—Improved distributor for insecticide, disinfectant, and other powders.* January 10, 1895.
- No. 720.—Arthur Clifford Granville, 37, Cursitor Street, Chancery Lane, London.—Improved cattle and poultry food. January 11, 1895.
- No. 748.—Marius Otto, 28, Southampton Buildings, Chancery Lane, London.—Apparatus for transforming oxygen into ozone. January 11, 1895.
- No. 788.—Samuel Archibald Vasey, Kingsthorpe, Lower Park, Loughton, Essex.—Improved compound forming an antiseptic, disinfectant, and deodorant. January 12, 1895.

- No. 834.—Mary Anne Hicks, 57, Chancery Lane, London.—A curative or antiseptic compound, applicable for use as a salve or as a plaster or the like. January 12, 1895.
- No. 834.—Richard William Hill, 97, Newgate Street, London.—Production of liquid ammonia by electricity. January 14, 1895.
- No. 895.—Victor Bélanger, 45, Southampton Buildings, Chancery Lane, London.—Improvements in devices for preventing the refilling of bottles.* January 14, 1895.
- No. 932.—Henry Ward Powis and John Ellis, 101, Leadenhall Street, London.—Improvement in liquid filters.* January 15, 1895.
- No. 938.—Frederick Booth Thatcher, 11, Southampton Buildings, Chancery Lane, London.—Improvements in bottle stoppers.* January 15, 1895.
- No. 950.—Henri Weymersch, 47, Lincoln's Inn Fields, London.—The manufacture and production of a new material for use in obtaining oxygen from atmospheric air. January 15, 1895.
- No. 976.—Henry Edward Newton, 6, Bream's Buildings, Chancery Lane, London.—The manufacture or production of chemical compounds. (*The Farberfabriken vormals Friedrich Bayer and Co., Germany.*) January 15, 1895.
- No. 998.—Alwin Goldberg and Wilhelm Siepermann, 4, South Street, Finsbury, London.—An improved process for the preparation of sulpho-cyanides. January 15, 1895.
- No. 994.—Ernest George Scott, 4, South Street, Finsbury, London.—Improved process for the manufacture of acetic acid. January 15, 1895.
- No. 1168.—Ulrich Frederic Benker, 46, Lincoln's Inn Fields, London.—Improvements in the manufacture of sulphuric acid. January 17, 1895.
- No. 1190.—George Thompson and William Thompson, 2, Market Street, Bradford.—A new or improved instrument or appliance for administering medicine to horses, cattle, sheep, dogs, or other like animals. January 18, 1895.

SPECIFICATIONS PUBLISHED DURING FEBRUARY.

Double Soda Salt (Johnson, G. S.).—Comprises the preparation of a double salt consisting of two molecules of sodium sulphite, one molecule of sodium carbonate, and twenty-one molecules of water. The salt is said to be stable in air, and to be only slowly oxidised when in strong solution, but the solution behaves as a mixture of sulphite and carbonate when the compound is dissolved in four parts of water. No. 1449 of 1894.

Petroleum Compounds.—Two patents have been published, one by C. Weygang (No. 3025 of 1894) and the other by the same in conjunction with the Petroleum Syndicate (No. 23,995 of 1894). The inventions are very similar, and comprise the production of petroleum compounds suitable for soap, fuel, lubricant, varnish, vehicle for paint, insecticide, etc. The procedure varies according to the proposed use, but consists in the admixture, under stated conditions, of petroleum with one or more of the following substances:—caustic alkali, palm, cocconut, linseed, cottonseed, castor or other oil, resin, naphthalene, turpentine, sodium carbonate, borax, calcium chloride, zinc sulphate, and salts of iron. For use as fuel, powdered coal, with or without calcined gypsum, is used. Nos. 3025 and 23,995 of 1894.

Filter (Lipscombe, F. R.).—The filter is so constructed that the water passes through perforated pipes or round baffle plates in such manner as to expose it to the maximum surface of the filtering medium. The filter may work by gravitation, suction, or pressure. No. 3867 of 1894.

Bronchitis or Vapour-bath Kettle (Coles, C. H.).—The kettle has removable legs and handle. It has no spout, and its lid is replaced by a chamber having a perforated bottom on which a "medicated preparation or camphor bag" is placed. The steam is thus medicated while escaping at the perforations. No. 4528 of 1894.

Caps for Collapsible Tubes, &c.—The cap of a collapsible metal tube, perfume bottle, etc., is fitted to a pivoted piece swinging on the neck. It has a plug which is caused to close the vessel by a spring or screw, and the

vessel is opened by raising the plug and turning the pivoted piece aside. No. 4833 of 1894.

Ozone (Schneller, A., and Wisse, W. J.).—A modification of the ordinary silent-discharge apparatus is used, a transformer or other source of high-tension electricity being employed. The invention consists mainly in inserting a resistance between the transformer and one or both of the discharge surfaces to prevent production of voltaic arcs and to ensure a sparkless discharge. No. 5656 of 1894.

Areometer (Lohnstein, T.).—The invention is intended to obviate the error commonly introduced by rise of the liquid on the areometer spindle from capillarity. It comprises the use of a bulb which floats with its upper surface, which is ground at right angles to the axis, level with the surface of a liquid having a specific gravity of 0.7000 at 15° C. The upper end of the bulb carries a spindle on which hangs a frame carrying a pan. In testing liquids heavier than 0.7, weights are placed on the pan as usual. No. 5686 of 1894.

Ferrocyanide of Potassium or Sodium (Hetherington, A. E., and Muspratt, E. K.).—Iron in the form of filings, etc., is mixed with melted pitch and heated to reduce any iron oxide to metal. The mass is then mixed with sulphocyanate of potassium or sodium and heated to 700° or 800° F. The product is lixiviated, and carbonic acid is blown through the filtered solution to convert the potassium or sodium sulphide which has been formed, into carbonate. The ferrocyanide is finally crystallised out. No. 5680 of 1894.

Alloys of Potassium or Sodium with Lead (Hetherington, A. E., and Hurter, F.).—Comprises the production of alloys of potassium or sodium and lead, rich in the alkali metal, by the electrolysis of fused caustic alkali, using a cathode of molten lead and an anode of iron. No. 5631 of 1894.

Making Compressed Tablets and Pills (Thomas, L.).—A machine is used in which both the dies and punches are alternately withdrawn from the mould, thus preventing clogging and facilitating cleaning. No. 51,294 of 1894.

Electrolysis (Richardson, J. C.).—In the electrolysis of fused alkaline salts, etc., a second cathode of copper oxide is added to the commonly-used mercury cathode. The hydrogen which is liberated by the action, reduces the copper oxide to metal, and is thus prevented from polarising the cathode. No. 22,613 of 1894.

Personal and Trade Notes.

The new price-list just published by Mr. C. Baker, of High Holborn, W.C., shows evidence of very thorough revision, and serves as a useful guide in comparing the different makes of foreign microscopes, objectives, etc., with those of home manufacture.

Mr. James Eggo, manufacturing chemist, Birmingham and London, submits a sample of Dr. Tibble's "Vi-Cocoa," which is described as being prepared from malt, hops, kola, and cocoa. The malt is added to assist in digesting starchy matter, hops for their soothing and tonic effect, and kola and cocoa for their sustaining properties.

Messrs. W. Phillips and Co., chemists, Lewisham High Road, London, S.E., have dissolved partnership.

Messrs. Idris and Co., Limited, London, have acquired the aerated-water business of Messrs. Handel and Co., Teddington.

A surgical instrument shop has been opened by Messrs. Allen and Hanbury, Limited, in Wigmore Street, W.

Mr. J. O. Stringer has purchased the business carried on by Mr. C. J. Griffiths, at Kingston-on-Thames.

Messrs. A. and M. Zimmermann, Cross Lane, St. Mary-at-Hill, E.C., have been appointed agents for Leerbeck and Holm's "Albumin Maltose," a new food for invalids. This preparation is also supplied in combination with iron in a soluble form, the product being free from astringency.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SUNDAY, FEBRUARY 17.

Sunday Lecture Society, at 4 p.m.

"How Discoveries are Made—a Study in Scientific Method" (Illustrated), by Professor Henry E. Armstrong.

MONDAY, FEBRUARY 18.

Imperial Institute.

House Dinner at 6.45 p.m.

"The Eye and Photography" (Illustrated), by Capt. W. de W. Abney.

Society of Arts, at 4 p.m.

"Means for Verifying Ancient Embroideries and Laces" (Second lecture), by Alan S. Cole.

London Institution, at 5 p.m.

"Dickens's London," by the Rev. Canon Benham.

Victoria Institute, at 4.30 p.m.

"The Evolution of the Natural and the Artificial," by Alfred Taylor Schofield.

TUESDAY, FEBRUARY 19.

Royal Institution of Great Britain, at 3 p.m.

"The Internal Framework of Plants and Animals" (Sixth Lecture), by Professor Charles Stewart.

Society of Arts (Foreign and Colonial Section), at 8 p.m.

"Paraguay," by A. F. Baillie.

Central London Throat, Nose, and Ear Hospital, at 4.30 p.m.

"The Treatment of Disease causing discharge from the Ears," by Dr. Dundas Grant.

Aberdeen Chemists' and Druggists', Assistants', and Apprentices' Association, at 9.30 p.m.

Short papers.

WEDNESDAY, FEBRUARY 20.

Imperial Institute.

Concert Dinner at 6.30 p.m.

Ladies' Concert at 8.30 p.m.

Society of Arts, at 8 p.m.

"Rule of the Road at Sea," by Admiral P. H. Colomb.

Royal Microscopical Society, at 8 p.m.

Ordinary Meeting.

Geological Society of London.

"Contributions to the Palaeontology and Physical Geology of the West Indies," by J. W. Gregory.

"The Whitehaven Sandstone Series," by J. D. Kendall.

"Notes on the Genus *Murchisonia* and its Allies, with a Revision of the British Carboniferous Species and Descriptions of some new Forms," by Miss Jane Donald. Communicated by J. G. Goodchild.

Western Chemists' Association (of London), at 9 p.m.

Discussion on "Prescribing by Chemists," introduced by J. C. Hyslop.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.

Apprentices' Night. Conducted by Alex. J. Dey.

THURSDAY, FEBRUARY 21.

Imperial Institute, at 8.30 p.m.

"Photography as Applied to the Production and Reproduction of Pictures" (Illustrated), by George Davison.

Royal Institution of Great Britain, at 3 p.m.

"Meteorites" (Second Lecture), by L. Fletcher.

London Institution, at 7 p.m.

"National Song" (Illustrated), by Professor W. H. Cummings.

Linnean Society of London, at 8 p.m.

"On *Chionanthus ghaertii*, Gaertner," by J. J. Boerlage.

"New Marine Algae from Japan," by E. M. Holmes.

Chemical Society, at 8 p.m.

Ballot for the Election of Fellows.

"The Electromotive Force of an Iodine Cell," by A. P. Laurie.

"Contributions to the Chemistry of Cellulose," by Messrs. Cross, Bevan, and Beadle.

"The Melting Points of Mixtures," by H. Crompton and Miss M. A. Whiteley.

"The Volumetric Determination of Manganese," by J. Reddrop and H. Ramage.

Chemists' Assistants' Association, at 8.30 p.m.

"Diatoms," by F. Ransom.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

"Some Recent Developments of Bacteriology," by J. B. Logan.

Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.

"Mental Hygiene," by Dr. John Carswell.

FRIDAY, FEBRUARY 22.

Royal Institution of Great Britain, at 9 p.m.

"Atmospheric Electricity," by Professor A. Schuster.

Sheffield Microscopical Society, 8.30 p.m.

"A Practical Demonstration in Grinding and Preparing Sections from Hard Tissue," by W. B. Tolpatt.

SATURDAY, FEBRUARY 23.

Royal Institution of Great Britain, at 3 p.m.

"Moore's Irish Melodies" (with Musical Illustrations), by Sir A. C. Mackenzie.

Exchange.

WANTED.

'JOURNAL OF BOTANY,' 1891, 1892, 1893, and 1894.—Librarian, 17, Bloomsbury Square, London, W.C.

'THE ANALYST.'—Volumes of numbers from 1886 to 1891 inclusive. State price, which must be moderate. Johnson, care of J. Robinson, 125, South Lambeth Road, S.W.

OFFERED.

MAHOGANY COPYING CAMERA—14 by 14, single slide, carries to 5 by 4, Harrison's Head Rest, exchange for 12 by 10 or 15 by 12 camera (Field), with 2 or 3 slides. McMurray, Chemist, Helensburgh.

'REVIEW OF REVIEWS,' 1894, unbound, clean. Offers, cash or exchange, to A. H. Hinde, Chemist, Lowestoft.

Trade Marks Applied For.

[Compiled from the Trade Marks Journal.]

182,862.—DEVICE OF AN OBLONG, CIRCLE-ENGRAVED LABEL, BEARING FAC-SIMILE SIGNATURE OF THE APPLICANTS. Chemical substances prepared for use in medicine and pharmacy.—Thomas Tyrer and Co., Stirling Chemical Works, Abbey Lane, Stratford, London. October 12, 1894. The essential particulars are the combination of devices and the fac-simile signature.

183,707.—ARGONINE. Chemical substances prepared for use in medicine and pharmacy.—Die Farbwerke vorm. Meister Lucius and Brüning, Hoechst a. Main, Germany. November 16, 1894.

183,855.—QUINELLA. A medicine for inflammation of the bowels in canaries, poultry, and pigeons.—Frederic Tibbs, 80, Parkhurst Road, Holloway, London. November 23, 1894.

No. 183,653.—ANTHION. Two crossed triangles with double oval crossed by the word "Anthion." The essential particular is the device. Chemical substances used in photography.—The Chemische Fabrik auf Aktien (vormals E. Schering), 170, Müller Strasse, Berlin, Germany. November 14, 1894.

No. 181,144.—EUREKA. Devices on a shield with the word "Eureka" above. The essential particular is the device. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes, except sanitary soap and goods of a like kind.—Tomlinson and Howard, Mint Street Chemical Works, Lincoln. July 1894.

No. 183,786.—ZENINE. Ointment for human use. Alexander Jamieson, 1, York Place, Stirling, North Britain. November 19, 1894.

No. 183,846.—VIDONE. A compound of hypophosphite being a medicinal preparation for human use.—Edmund Jones, Medical Hall, 60, Miles Bank, Hanley. November 23, 1894.

Weekly Drug and Chemical Report.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between these prices and those of the wholesale drug trade.]

THURSDAY, FEBRUARY 14, 1895.

We are unable to record any improvement in the Chemical Market this week. It is, in fact, hopeless to look for any until the frost breaks up, as it has proved a great impediment to the delivery of consignments. The prices are for the most part unaltered, yet the tone of the market is very weak, and where changes have taken place they have been on the down line. Citric and tartaric acids remain neglected at last week's prices. Oxalic acid is very steady, without any alteration in price. With respect to ammonia compounds, sulphate is decidedly easier. This is, however, unaccompanied by any reduction in carbonate or sal ammoniac, which are quoted at the old rates. Arsenic is unchanged, without being in large supply. The weak tone of the cream of tartar markets has been maintained; it was, in fact, at the early part of the week fractionally easier, but closes unchanged. Bleaching powder is unchanged, as are also mercurials and quicksilver. Copper sulphate is very steady at unchanged rates. With respect to quinine, a decidedly firmer tone prevails for the German article, and a corresponding rise has ensued. Soda and potash compounds are practically unchanged. Details:—

ACID, BORACIC.—Prices still reported are: Crystal, 80s.; powdered, 82s.

ACID, CITRIC.—No movement of interest is to be noted, the market being very dull. Still offered at from 1s. 1½d. to 1s. 3d.

ACID, OXALIC.—Supply and demand are very fairly balanced, and prices remain unchanged at 8½d. ex rails.

ACID SALICYLIC AND THE SALICYLATES.—The quotations remain unchanged, being to a great extent controlled by the syndicate manufacturers.

ACID, TARTARIC.—Nothing of interest has transpired, and the low quotations which were noted last week have not been improved on. English makers still quote 10½d. to 11d. Foreign ditto, crystals, 10½d.; powder, 10½d.

AMMONIA SALTS.—Sulphate: The probability of further decline which was in evidence last week, has been fulfilled, prices being 5s. lower. Quotations: Grey, 24 per cent., £11 2s. 6d. Carbonate: No change; the market is very steady, being quite uninfluenced by the variations in sulphate. It is still quoted at 8½d. to 3½d. Sal Ammoniac: Business continues steady at unchanged prices. Quotations: first quality, 89s.; second ditto, 87s.

ASHES.—Steady at unchanged rates. American is still quoted at 40s. with pots at 28s.

ARSENIC.—The market remains quiet, yet supplies are limited. The quotations stand 14s. 9d. to 15s.

BLEACHING POWDER.—Business fairly brisk, with no sign of reduction. Prices 8s. 8d. to 8s. 6d.

BORAX.—In steady demand at last week's prices. Quotations: Crystals, 20s.; powder, 21s.

COPPER SULPHATE.—The prices still remain high. In fact for cheaper brands a fractional advance has occurred. Quotations: Ordinary brands, £14 17s. 6d.; special ditto, £15 10s.

CREAM OF TARTAR.—No improvement on last week's fall is to be noted, the market remaining very quiet. Fine white crystals are still quoted at 63s., whilst powdered is worth 65s.

MERCURIALS.—Unchanged. Quantities up to 28 lbs. are quoted:—Calomel, 2s. 9d.; red precipitate, 3s.; white do., 3s.; corrosive sublimate 2s. 5d.

POTASH COMPOUNDS.—The market is quiet, but fairly steady. Prussiate has not declined further, but remains quiet at 9½d. to 10d. Chlorate is weaker at 4½d. Bichromate remains at 4½d. to 4½d.

QUICKSILVER.—Unchanged; the uniformity between the quotations of first and second-hand holders continues, the

two being practically identical. First hands, £6 10s.; second ditto, £6 9s. 6d. to £6 10s.

QUININE SULPHATE.—The market has afforded a market contrast to that of the previous week, and indicates a firmer tone for the German article with a considerable rise in price, and probability of further advance. The sales include items of 5000 oss. Brunswick at 11½d., and 25000 oss. B and S and Brunswick at 11½d. to 11½d. The demand has been very brisk, and 12d. has been paid. This is fully ½d. to 1d. higher than ten days since.

SODA COMPOUNDS.—Quiet at unchanged rates. Caustic is quoted at £8 to £8 10s. for 70 per cent. white, with 60 per cent. at £1 less. Crystals unaltered at 88s. Bicarbonate also remains at £7 5s. (London.)

THE DRUG MARKET.

ALOES.—The market is quiet, but steady. At last week's sales the quotations for Cape were higher, with East Indian steady. Of a parcel of 296 packages Curaçao offered, 16 sold fair lively 40s. to 55s. Forty-four gourds of Barbados, offered without reserve, fetched 6s. 6d. dull lively.

BENZON.—Steady. Fine Sumatra fetched high prices. Bold first quality as much as £15 10s. Fair clean seconds £7 to £7 2s. 6d. Sumatra seconds, fine, £11; fair, £9 5s. Penang seconds, glassy yellow, 75s.

BUCHU.—Dull. At the sales two bales of good short green leaves were sold out of a parcel of 13 bales at 8½d.

CASCARILLA.—Of 59 bales offered, 24 sold, fair small to bold silvery, 52s. to 53s.; damaged bark, 29s. to 47s.

CINCHONA.—Remains quiet. Loxa sold at 1s. to 1s. 2d.; fair flat Calisaya, 10d., with damaged bark, 1½d. to 7½d.

COPAIBA.—Steady; is quoted 1s. 2d. to 1s. 8d., the latter being obtainable for good quality Maranham.

CAMPHOR.—The demand is very firm. After declining in the market for some time, has now advanced in price. English refiners notify an advance of 1½d. For half-ton quantities of camphor in bells, quotations are 1s. 4½d.

IPCACUANHA.—The market is very firm, and prices are dearer. It is now sold without tret. Good Rio (Brazilian) root is worth 5s., with inferior 4s. 8d. to 4s. 6d. Carthage (New Grenada) is quoted at 4s. for good quality; seconds, 3s. 8d. to 3s. 6d.

JALAP.—Is very steady. At the sale a parcel of seventeen bales was retired, very firmly held. Privately, fair Vera Cruz is selling at 1s. 8d.

MYRRH is quiet.—At the sales, native picked gum fetched £5, siftings, 45s., fair pickings, 84s.

OILS (essential).—From all we can learn the oils of Neroli, lavender, and in fact all oils, the produce of Grasse and surrounding districts, will command much higher prices, owing to the inclement weather.

OILS (fixed) AND SPIRITS.—Cod liver: Quotations continue to advance, in fact there seems to be no limit to the price which it may reach. The severity of the weather has proved a great impediment to delivery. We hear of one importer whose consignment, although it arrived in the Thames on Monday, has not yet been landed on account of the barges being frozen up. Finest new non-congealing oil is worth 200s. per barrel of 25 gallons nett in Norway, and if reports are to be relied on, we may expect to have still higher prices. Prime oldoil is quoted at 170s. per barrel of 25 gallons. Peach kernel oil has advanced 1d. For quantities of half a ton &c. would be accepted. Linseed: The market is very firm and the prices are continually on the up line, owing to a poor supply, as cargoes cannot be landed. £21 7s. 6d. is now readily paid, £21 10s. being asked for. Cotton: In quiet demand, and a trifle easier. The refined article is worth £17 5s. to £18 5s. according to the brand. Coco-nut: Steady; Ceylon, £23; Cochin, £25. Rape: Steady at unchanged prices, refined oil being worth £23. Turpentine: Very steady at increased rates. Quotations for American spirit are 21s. 9d. to 22s. Petroleum: Steady, at a fractional advance. Americans 4½d. to 4½d.; Russian, 4½d. to 4½d. Petroleum Spirit: Ordinary, 7d.; deodorised, 7½d. to 7½d.

OPIMUM.—Although amount of business done is but small, the market remains very firm in tone. Turkey:

Best selected is quoted at 12s. to 12s. 6d.; ditto seconds, 11s. to 11s. 6d.; "druggists," 9 lb. to 11s. *Persian* is firmly held at 11s. to 12s.

SHELLAC.—The market is fairly steady, and prices remain firm, although sales are small. There is little disposition to operate speculatively, and privately the demand is slow on a basis of 110s. to 111s. for TN orange. At the last sales an advance of 8s. on the previous rates for good TN. qualities of orange were noted. Inferior sorts steady, but little doing. Of a total of 832 cases offered, 430 were sold.

TOLU BALSAM.—Firm, in fair demand, quotation being 1s. 3d. for good qualities.

COCHINEAL.—The prices are very firm, there being but little offered and readily bought up. Quotations, 1s. 4d. for black and 1s. 4½d. for silver.

WAX.—In rather poor supply. *Madagascar*: Mixed grey and yellow wax is worth £7 5s., with grey, £7. *East Indian*: Good quality yellow Madras, £6 15s. to £7. *Japan*: No sales to be noted. *Jamaica*: Good pale wax sold at £8 5s. *Cape*: Fine yellow, £8 2s. 6d.

Late News.

SHEFFIELD PHARMACEUTICAL AND CHEMICAL SOCIETY.—At the meeting of this Society on Wednesday night Mr. J. F. Eardley, the President, occupied the chair, and amongst those present were Messrs. G. T. W. Newsholme, G. Ellinor, G. Squire (sec.), and others. The proceedings were opened by a discussion on the subject, "Does the Sheffield School of Pharmacy provide efficient tuition for its students?" Mr. Mallaband read a paper to open the debate on the negative side. The unsatisfactory state of the school from a student's point of view was regarded as the result of apathy on the part of the students, but he contended that the fault lay with the school itself. Too much was attempted, especially in chemistry, the session's curriculum containing, in his opinion, enough for three sessions. Therefore there was inability to do the work thoroughly, and the lecturers were often unjustly blamed. He advocated an adjustment of the curriculum on the lines of the Science and Art Department, and suggested a course of study which he believed would produce better results, both with regard to the school and the students attending it.

The President agreed that the syllabus was too extensive for one session, and suggested that if the students were to rally round the Society something might be done to remedy that. He did not think a chemist should take three or four apprentices unless he could allow them sufficient time for study and attending lectures. Mr. G. T. W. Newsholme did not think any advantage would come from going on the Science and Art Department lines. He argued that the syllabus was too big, and expressed the opinion that a compulsory curriculum was desirable. The time was coming when the members of their body would have to be much better educated than they were to-day. Other speakers followed, and the usual vote of thanks was passed.

A BRADFORD CHEMIST'S OFFENCE UNDER THE EXCISE ACT.—On February 12, at the Bradford Borough Court, action was taken by the Board of Inland Revenue against William Cockshott, chemist, Westgate, Bradford, for having sold tincture of arnica in the preparation of which methylated spirit had been used instead of rectified spirit of wine.—Mr. J. A. Wallace, Acting Supervisor to the Board of Inland Revenue, Bradford, prosecuted, stating

that the charge was laid under a section of the Spirits Act of 1880 which prohibited the use of methylated spirit in any preparation capable of being used as a beverage or for medicine to be internally applied. The regulations were strict for two reasons, one being that there was no Excise duty on methylated spirit, which was extensively used for manufacturing purposes, while there was a heavy duty on rectified spirit of wine; again, it was desirable that the public should get the genuine article. On December 6 an officer of the Board of Inland Revenue purchased at the defendant's shop a 1 oz. bottle of arnica which had been prepared with methylated spirit, rendering the defendant liable to a fine of £100.—Evidence was given by the officer in question and an analyst of the Board of Inland Revenue.—The defendant pleaded not guilty, stating that he had been in business in Westgate for fifty years, and this was the first charge of any kind which had been brought against him. He was ignorant that such a preparation was on his premises, and he had never sold it. His son attended to the shop, but he did not think that he had made up the preparation for ordinary sale.—The defendant was fined £3, without costs.—*Bradford Observer.*

JUNIOR PHARMACY BALL.—The fourteenth Junior Pharmacy Ball was held at the Portman Rooms, London, on Wednesday last. More than 400 guests were present, and Mr. Michael Carteighe took the chair at supper. After proposing "Success to the Junior Pharmacy Ball" and "The Ladies," the Chairman called for a hearty vote of thanks to the Committee, and especially the Honorary Secretary, and at the same time announced that boxes had been placed in the room for contributions to the Benevolent Fund of the Pharmaceutical Society, as the low price at which the tickets were sold left a lower margin of profit for the Fund than was desirable.

The Honorary Secretary (Mr. H. Arliss Robinson) replied for the ladies, and with becoming modesty insisted that his success was mainly due to the efforts of the stewards, some of whom had disposed of more than thirty tickets, and to the Portman Rooms Company, whose catering was most satisfactory.

Among the ladies present were Mrs. Carteighe and Mrs. T. C. W. Martin. Mr. T. C. W. Martin, assisted by Mr. C. W. Martin, once more acted as M.C., and amongst other gentlemen present were Messrs. T. H. W. Idria, L.C.C., Richard Bremridge, and J. C. Umney.

LATE ADVERTISEMENTS.

Business for Disposal.

£150 (part can remain), Bristol.—Retail and Prescribing. Returning, through being neglected, £8 a week. Lately did £12, and can again. Good house, which could be let off. Private back entrance. Ample stocked. Proprietor must sell at once, having other business in hand. Fortune to a young energetic man. Well established. Beautifully fitted. Main thoroughfare. CHEMIST, 135, Lawrence Hill, Bristol.

Engagements Wanted.

MANAGER or ASSISTANT. Qualified. Married. 28. Country preferred. West-end and provincial experience. Good references. Address, BROMUM, 5, Serle St., W.C.

MANAGER. 31. Married. First-class experience. Excellent references. BORAX, 5, Serle St., W.C.

ASSISTANT. 10 years' provincial and first-class West-end experience. Age 25. Height 5ft. 5in. Minor qualification. Out-door. GUAIACUM, 17, Errington Rd., St. Peter's Park, London, W.

Notes.

NEW LABORATORY AT ST. PETERSBURG.—The new chemical laboratory at St. Petersburg University has cost £32,720, and fulfils all the requirements of modern scientific research. Special rooms are allotted to physical chemistry and accurate physical measurements, and the arrangements for each separate worker are said to be perfect.

HUNTERIAN ORATION.—The Hunterian Oration on the 166th anniversary of the birth of John Hunter was prepared by the late J. W. Hulke, President of the Royal College of Surgeons, and read on February 14 by Mr. Bryant. Its subject was "John Hunter, the Biologist," and the writer dealt at length with Hunter's acuteness as a field naturalist and his skill as a zoologist and morphologist.

S. M. BURROUGHS' MEMORIAL.—A preliminary list of subscribers to the Burroughs' Memorial Fund is now being distributed (see p. 73), and subscriptions may be forwarded to Mr. John Moss, 89, Tressillian Road, St. John's, S.E. It is proposed that the Memorial should take the form of a Pharmaceutical Scholarship or a special Benevolent Fund.

GREENOCK PERSONATION CASE.—The appeal in this case has been postponed on account of the indisposition of the Sheriff, and will probably not be heard before March 11.

MASONIC PRESENTATION.—At a special meeting of Oban Lodge Commercial, No. 180, on Tuesday, February 19, a Past Master's jewel was presented to Bro. S. Lawrence, chemist and druggist, as a mark of appreciation of the valuable services rendered by him to the craft, in the capacity of Master of the Lodge for the past three years. It was accompanied by a gold brooch, set with pearls, for Mrs. Lawrence. Mr. Lawrence was for some time a member of the Executive of the North British Branch of the Pharmaceutical Society.

EFFECTS OF THE FROST.—Mr. J. A. Cope, Pharmaceutical Chemist, Derby, sends a photograph of a bottle of Hunyadi Janos Mineral Water, which curiously illustrates the effects of the recent severe frost. During the night of February 7 the contents of the bottle became partially frozen and the cork was forced out, remaining attached with the capsule to the top of a projecting rod of ice. The next morning further freezing and expansion took place, and another length of the ice rod was forced out. The general appearance is that of a candle stuck in the bottle-neck.

CHEMISTS' ASSISTANTS' ASSOCIATION.—The seventeenth annual dinner of this Association takes place at the Cannon Street Hotel, on Thursday next, March 7, at 8 p.m., when the chair will be taken by Mr. Walter Hills, of the firm of John Bell and Co., member of the Pharmaceutical Council.

DEATHS OF CORRESPONDING MEMBERS.—Two corresponding members of the Pharmaceutical Society have recently died—Andrew Ferrein, M.C., of Moscow, Member of the Moscow Board of Health, and Jean Edouard Bonnier, Professor of Botany at the University and Curator of the State Botanical Gardens Brussels.

WEIGHTS AND MEASURES.—Mr. H. J. Chaney superintendent of the Standards Department of the Board of Trade, gave evidence before the House of Commons Committee on this subject on February 26. He showed there were many weights and measures in use in the United Kingdom which are not legally recognised, instancing the boll, the ell, the ocomb, the Winchester bushel, the butcher's stone of 8lb., the miner's dish, and the gauge, as used in measuring plates. He also stated that, practically, the only two countries of any importance in Europe in which the metric system was not adopted were Great Britain and Russia.

COPPER IN GREEN PEAS.—In a case heard at Edmonton last week (see p. 72) a conviction was obtained for using copper to preserve the colour of green peas. Copper was stated to be present to the extent of 0.7 grain per pound. In the case recently dismissed at Bristol, the amount of copper found was only 0.205 grain.

BUSINESS CHANGE.—The drug business carried on by Mr. Sydney Keith, at 69, South Clerk Street, Edinburgh, has been purchased by Mr. Jeremy Blenkiron, principal assistant to Mr. J. C. Pottage, 117, Princes Street, who is to enter into possession on Monday, March 4.

POISONING BY CHLORODYNE.—In reply to the communication received by Mr. William Thomas from the coroner, Dr. Danford Thomas (*Ph. J.*, ante, p. 713), directing his attention to the danger to the public safety incurred by not labelling his chlorodyne "poison," Mr. Thomas states that no chlorodyne has been sold at either of his establishments except what was properly labelled in accordance with the Pharmacy Act, "on the outside wrapper." As previously noted, objection was taken by the jury to the omission of the word "poison" from the label on the bottle itself.

THE ETERNAL NEWS.—In this work, Mr. John Jarvey Brown, chemist and druggist, discourses at length concerning "time and space, substance, motion and shape—the entire total of all being or existence." "Substance is spirit," he remarks, but more of his Scottish friends will probably agree with his converse proposition, that "spirit is substance." In the preface readers are asked to mark what they believe in the book, and let the author know the result, as opinions sent to him "will be prized and preserved as of likenesses of fellow spirits." The general style of the work will be familiar to those who have perused Mr. Brown's lucubration, published in the Journal recently.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

COPPER IN GREEN PEAS.—On Thursday, February 21, at the Edmonton Petty Sessions, before Mr. Alderman Latham and other justices, Messrs. Kearley and Tong, grocers, of 186, Fore Street, Edmonton, were summoned for selling an article of food—a tin of green peas, which were coloured or stained by the aid of copper to the extent of 7/10ths of a grain of copper per pound, thereby rendering them injurious to health. Mr. A. H. Bodkin prosecuted for the Middlesex County Council, and Mr. Walter Beard defended.—Dr. J. F. Sykes, medical officer for St. Pancras, and Dr. Dupré and Dr. Luff, analysts to the Home Office, stated that sulphate of copper was a poison which, if taken into the system in the quantities found in the peas, would produce chronic copper poisoning. It was used to make the peas retain their greenness, and the effects would be most injurious, especially to a weakly person.—For the defence, Mr. Beard said that there were 16,000,000 tins of the peas imported annually, and yet there was not one known case where it was shown that they had produced any injurious effects. He called Mr. Otto Hehner, public analyst for Nottinghamshire, who said, though there was more than the usual quantity of copper in the sample in question, he did not think it would produce the effects suggested by the prosecution.—After a hearing lasting over four hours, the Bench convicted the defendants and inflicted a fine of 20s. and 20 guineas costs. Notice of appeal was given.—*Daily Telegraph*.

PHARMACEUTICAL FOOTBALL CLUB.—Having been prevented from playing by the frost for four weeks the Pharmaceutical team were eager for the game fixed with the London Welsh for last Saturday. The weather was splendid, and the ground, although rather hard, was in good condition. At the last match, played on the ground of the London Welsh, they won by two goals to one, and it was now expected that the Square team, being in good force and playing on their own ground, would equalise matters. The Welshmen, however, found themselves by some chance three or four men short, and two or three more being alarmed at this also disappeared. Through an accident to one of the players in the cup-tie between Hammersmith Athletic and Shepherd's Bush on a neighbouring ground that match was stopped, and enough players were found among them to make up a scratch game, which was well enjoyed.

Next Saturday the return match with Clissold will be played on the home ground at Wormholt Farm, when friends of the club may see an interesting match.

MASON COLLEGE, BIRMINGHAM.—Professor Allbutt, Regius Professor of Physic in the University of Cambridge, presided at the annual dinner held at Birmingham on Saturday last, in celebration of the birthday of Sir Josiah Mason, the founder of Mason College. In proposing the toast of "The College," Professor Allbutt referred to the extended usefulness of the college, in having added since its foundation many scientific subjects to its curriculum. It was not merely an institution for imparting technical knowledge. If, in regard to brewing, for instance, they

taught just so much chemistry as was useful, that would be technical training in its bad sense. The brewers had now found out—because some brewers or some chemists got into association with biologists—that the science of biology had a most remarkable and ultimate bearing on the industry of brewing. In those days things were taught in what he called the university spirit. A man learned biology or chemistry as science, and for its own sake, and taking the vulgar pecuniary reward only into consideration, enormous advantages had flown from the fact.

ROYAL INSTITUTION.—In his lecture on Tuesday, February 20, Professor Stewart dealt with the coral polyps or *Anthozoa*, so-called on account of the flower-like appearance which many of them present; they commonly secrete carbonate of calcium to form a supporting framework. The general structure of these polyps was exemplified by a description of the structure of a sea anemone. In this creature the body wall consists of ectoderm, mesogloea and endoderm; the mouth opens into the body cavity, which is partially divided into partitions by a number of mesenteries or sarcosepta. Reproduction takes place either sexually by ova produced on the mesenteries or asexually by budding, fission or extension of the base with production of new anemones. The cells of the ectoderm secrete carbonate of calcium, together with a small quantity of organic matter, which, deposited on the rock, fills up all inequalities and forms a base-plate. Upon the upper surface of this plate calcareous rays or septa are formed and develop into plates and form the theca, in the centre of which is a small column, the columella. The structure of the mushroom coral and the mode by which it is produced was fully discussed, after which Professor Stewart passed on to notice *Pocillopora* and *Turbinolia*.

THE RELATION OF ENERGY OF COMBINATION TO ELECTRICAL ENERGY.—The problem of directly converting the stored-up energy of coal into available electrical energy is one of great importance; and as a first attempt to perform this operation, the experiments made by Dr. W. Borchers, of Duisburg, and which he described before the first annual meeting of the Deutsche Elektrochemische Gesellschaft, possess great interest. The author in the first place produced an electric current by the "combustion" of carbonic oxide gas. The original form of the apparatus used consisted of a glass vessel divided into three compartments by two glass plates which nearly reached to the bottom of the vessel. In the two exterior compartments copper tubes were placed, which served for the introduction of the carbonic oxide, while the middle compartment contained a bell-shaped mass of carbon. This carbon bell constituted one plate of the cell, and the oxygen was introduced by means of a tube within this bell. As electrolyte the author uses an ammoniacal or acid solution of cuprous chloride; this liquid readily absorbs both oxygen and carbonic oxide, and is therefore particularly well suited to form the electrolyte in a gas battery in which these gases are used. Coal gas which contains 5 per cent. of carbonic oxide was, after the first experiments, used in place of pure carbonic oxide. The copper tubes were weighed before and after each experiment, and no decrease in their weight was ever found. With such a cell working through an external resistance of 0.1 ohm a current of 0.5 ampere was obtained, while with an external resistance of 50 ohms the difference of potential between the terminals was 0.4 volt.

With a cell in which the outer compartments were filled with copper turnings, in order to increase the

absorption of carbonic oxide by exposing a greater surface, and by using coal gas in place of pure carbonic oxide, a maximum current of 0.64 ampere was obtained, and by increasing the external resistance a maximum difference of potential of 0.56 volt was maintained. The E.M.F. obtained by calculation from the heat developed in the combination of CO and O is 1.47 volts, so that in the above experiment 27 per cent. of the energy of combination of the fuel is converted into electrical energy. Since a solution of cuprous chloride dissolves hydrocarbons, powdered coal was tried in place of carbonic oxide, when a maximum current of 0.4 ampere and a maximum E.M.F. of 0.3 volt were obtained. The above E.M.F. (0.3) corresponds to about 15 per cent. of the energy corresponding to the oxidation of carbon. In the case of the coal-dust, even when the liquid was kept in motion, there was always a considerable falling off in the current, while the pollution of the electrolyte by the coal would quite prevent its use. With the gases, however, there is no falling off of the E.M.F., and this pollution of the electrolyte does not occur.—*Nature*.

S. M. BURROUGHS' MEMORIAL.—The following is a list of the subscriptions already to hand:—

	£	s.	d.
Henry S. Welloome	105	0	0
The Chemist and Druggist	50	0	0
Benno Jaffé and Darmstaedter	25	0	0
H. Helbing	25	0	0
Alfred Bishop and Sons, Ltd.	25	0	0
Fred. W. Fletcher	21	0	0
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Michael Cartelge	10	10	0
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John Moss	10	10	0
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Ingram and Royle	10	10	0
A. W. Gerrard	10	10	0
Wilson, Salamon and Co., Ltd.	10	10	0
John Morgan Richards	10	10	0
J. W. Drysdale and Co.	10	10	0
J. F. Cantwell	10	10	0
Oppenheimer, Son and Co., Ltd.	10	10	0
Fossat and Johnson	10	10	0
Idris and Co., Ltd.	10	0	0
Fredr. Boehm	5	5	0
Dr. Gubb	5	5	0
B. Kühn	5	5	0
W. H. Strange	5	5	0
H. Walker	5	5	0
A. C. Wootton	5	5	0
Henry Sell	5	5	0
Jeyes' Sanitary Comp. Co., Ltd.	5	5	0
W. A. H. Naylor	5	5	0
G. H. Radford	5	5	0
Thomas Whiffen	5	5	0
H. M. Stanley	5	5	0
C. A. Lippincott	5	5	0
P. M. Justice	5	5	0
Jeremiah Lyon	5	5	0
W. Shepperson	5	5	0
Knott and Co.	5	5	0
Lewis and Towers	5	5	0
Grimwade Ridley and Co.	5	5	0
F. Mattox	5	0	0
G. Strong	5	0	0
C. Delaore	5	0	0
W. Hayes	3	0	0
Henry A. Lyman	3	0	0
S. Burghelm	2	2	0
Frank Smith	2	2	0
George Haller	2	2	0
Dr. F. W. Passmore	2	2	0

	£	s.	d.
R. W. Greeff	2	2	0
Peter MacEwan	2	2	0
A. C. Meyjes	2	2	0
H. E. Stevenson	2	2	0
Richard Bremridge	2	2	0
Baron de Bush	2	2	0
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Charles Symes	2	2	0
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Henry Williams	2	2	0
Dr. Magnoughton Jones	2	2	0
J. Gosnell and Co.	2	2	0
Mrs. Henry A. Lyman	2	0	0
Harold Moss	1	1	0
T. J. Wallis	1	1	0
Astor Boisselier	1	1	0
Henri Boisselier	1	1	0
Miss Boisselier	1	1	0
Miss N. Boisselier	1	1	0
M. S. Rickerby	1	1	0
James Spilsbury	1	1	0
E. M. Holmes	1	1	0
W. P. Want	1	1	0
F. H. Summers	1	1	0
Young J. Pentland	1	1	0
G. Wetherman	1	1	0
C. E. Lord	1	1	0
F. W. Warrick	1	1	0
F. C. Haron	1	1	0
Felix Moscholes	1	1	0
Dr. Ward Cousins	1	1	0
Woodman and Bailey	1	1	0
H. Rogers	1	1	0
Merton Russell Cotes	1	1	0

Further subscriptions should be sent to the Treasurer, Mr. John Moss, 39, Tressillian Road, St. John's, S.E., London.

Information will be given by the Hon. Sec., Mr. H. Halbing, 63, Queen Victoria Street, London, E.C.

Publications Received.

NOTE-BOOK ON MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS. By R. E. SCORESBY-JACKSON, M.D. Fifth edition. Revised by J. RUTHERFORD HILL and RALPH STUCKMAN, M.D. Pp. 743. Edinburgh: James Thin. From the Publisher.

PHARMACEUTICAL REGISTER OF VICTORIA FOR 1894. 2s. 6d. From the Pharmacy Board of Victoria.

THE ETERNAL NEWS. By J. J. BROWN. Pp. 80. From the Author.

Meetings of Societies.

ROYAL INSTITUTION OF GREAT BRITAIN.

There was an average attendance on the 22nd ult., when Professor A. Schuster lectured upon "Atmospheric Electricity." When this science was but in its infancy, it was noticed how the spark of a battery resembled thunder and lightning, and the idea soon became generally, although somewhat vaguely, accepted that a flash of lightning was only a form of electrical spark, whilst it was left for Franklin, who had long suspected that a thunder cloud was charged with electricity, to establish by experiment a complete parallelism between lightning and electricity. This he successfully accomplished in the year 1752, and on his researches are based the complete understanding we now have as to the various phenomena of atmospheric electricity. After briefly alluding to Franklin's and Faraday's work in connection with the subject, the question of the origin of the "lines of

force" was discussed, and Professor Schuster passed on to consider the various causes of de-electrification which are constantly going on. Important factors are fires; these discharge electricity constantly, and it was pointed out incidentally that factory chimneys themselves act as good conductors of electricity, better even than the lightning rod which is fixed to the summit. Having pointed out that the theory sometimes put forward as to the disappearance of the "lines of force" by passing away from the air into space was untenable, the Professor showed that on rising in the air the "lines of force" at first increase, but at altitudes of 15,000 to 20,000 feet they end. Their disappearance, however, depends upon the condition of the atmosphere, as in very fine weather they end at 12,000 feet. The fact that electrical effect in the atmosphere is dependent upon the moisture present is well established, but some observers have had an idea that it is influenced by solar radiation instead, and an instance was cited which showed that electrical effect in Germany was directly connected with a dust storm which occurred in Alexandria, the electrification not being shown before the storm.

In discussing the effect of lightning upon trees, statistics showed that forty-eight oak trees are struck to one beech tree, the ratio being dependent upon the amount of oily matter contained. Some curious effects of lightning having been described, a series of photographs were shown illustrative of various types of flashes, and after briefly alluding to silent discharges, the Professor described the phenomenon known as St. Elmo's fire. This name is derived from St. Erasmus, who was the patron saint of the Italian sailors. Its peculiarity is that it appears as either positive or negative, one condition being as probable as the other. The phenomenon is simply one of induction. The various hypotheses which have been advanced to account for atmospheric electricity were briefly noted. Their name seems to be legion, as they number since 1753 more than a score, whilst the year 1884 alone produced five new theories! Of this number the rotation of the earth, direct radiation, heat, and evaporation may be mentioned, and an instance was given, where from personal observation electrical effect was shown to be due to the actual formation of cloud. Speaking of the aurora borealis, it was mentioned that it seems to be connected with cirrus clouds at low altitudes, and that the many spots in the sun have been sometimes attributed to the existence of many auroras. The lecture was profusely illustrated by experiments, all of which passed off without a hitch.

SHEFFIELD MICROSCOPICAL SOCIETY.

A general meeting of the above was held on Friday, Feb. 22, in the Rutland Institute, Dr. Hall, B.A., in the chair. There was a large attendance of members.

Mr. Winder, F.C.S., F.R.M.S., gave a practical demonstration on "Micro-Photography." He showed how by means of an ordinary camera and microscope perfect results might be obtained, especially with the low-power object glasses, without going to the expense of more elaborate apparatus. Mr. Winder then took photographs of marine diatoms and anatomical objects by means of the various artificial illuminations, such as magnesium ribbon, oxy-hydrogen limelight, etc. The plates were then developed and lantern slides taken from them. The best and readiest means for this were adopted by the demonstrator.

Dr. Hall said he had been so much impressed by Mr. Winder's demonstration and the comparative quickness and ease of the manipulation, that he was now fully determined to introduce micro-photography

into the Sheffield School of Medicine, where he thought it would prove of great service both to students and lecturers.

Mr. J. Newton Coombe spoke of the application of micro-photography to his own special subject, that of "Diatoms." He had been advised by men of experience to "let it alone," and considering the numerous failures he had had in using the higher power objectives, he certainly thought that life was far too short to go in for this class of work. He was now contenting himself with drawing the objects by the aid of the camera lucida.

Mr. Newsholme could sympathise with Mr. Coombe in his remarks. He had himself experienced great difficulty in obtaining good results with the fresh-water diatoms, their structure was far too fine and transparent to get a clearly defined photograph. No doubt this might be overcome to some extent by using tinted glasses.

A hearty vote of thanks was then passed to Mr. Winder for his demonstration.

Poisoning Cases and Inquests.

Carbolic Acid.—At Sunderland on Wednesday, February 20, a young lady named Mora Tone, died from the effects of carbolic acid self-administered.—*St. James's Gazette.*

Strychnine.—Mary Radford, aged 75, died on Saturday, February 16, at 14, Icknield Port Road, Birmingham, from the effects of strychnine contained in a packet of vermin-killer, self-administered. Verdict: "Deceased committed suicide whilst temporarily insane." The coroner also commented upon the ease with which these poisons could be obtained.—*Birmingham Daily Post.*

Strychnine.—Mrs. Crewe, of Crew's Hole, St. George, near Bristol, died on Wednesday, February 20, from the effects of strychnine contained in a packet of vermin killer, self-administered.—*Bristol Times and Mirror.*

Opium.—Frances Charlotte Hannah Muggeridge, aged 32, died on Wednesday, February 20, in King's College Hospital, London, from the effects of opium, self-administered. Verdict: "Suicide while temporarily insane."—*Standard.*

Cyanide of Potassium.—Blake J. Weatherhead, an under-sheriff, died on Monday, February 25, at Berwick, from the effects of cyanide of potassium, self-administered.—*Daily Telegraph.*

Laudanum.—George Clarke, aged 40, died at Bournemouth, on Saturday, February 23, from the effects of laudanum, taken to produce sleep. Verdict: "Deceased accidentally poisoned himself."—*Daily Chronicle.*

Laudanum.—Edmund Hodgson, aged about 48, died on Saturday, February 23, at Sheffield, from the effects of an overdose of laudanum. Verdict: "Deceased died from an overdose of laudanum, administered by himself, but there was no evidence to show why he took it."—*Sheffield Daily Telegraph.*

Carbolic Acid.—Richard Whalley, aged 23, died on Monday, February 25, at Birkenhead, from the effects of carbolic acid, self-administered.—*Liverpool Post.*

Oil of Cloves.—Mrs. de Vere, wife of a Dalston tailor, gave her little girl oil of cloves in mistake for some cough syrup. An emetic was administered, but too late. The baby died, and at the inquest held on Thursday, February 21, a verdict of misadventure was returned.—*Star.*

Weekly Drug and Chemical Report.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between these prices and those of the wholesale drug trade.]

THURSDAY, FEBRUARY 23, 1895.

Since our last, the position of the Chemical Market has altered but little. A few changes only have occurred in the quotations, and they have for the most part been on the down line. Citric acid has not shown any marked change during the week, for although very steady at a fractional advance during the earlier part, it is at the close quoted at last week's rates. The position of tartaric acid remains unaltered. With regard to ammonia compounds, sulphate has been very steady during the week. After the quotations had been on the up line during the week, it closes very firm at a considerable advance. This advance has not, however, been accompanied by any change in the prices of carbonate or sal ammoniac. Arsenic remains very firm at unchanged rates, this applying also to ashes. As to borax, the tone of the market is very weak, and a slight reduction in the prices of both powder and crystals has been made. The demand for sulphate of copper remains very brisk at unchanged rates. Cream of tartar has been very steady throughout the week, and closes firm at last week's top quotations. Mercurials and quicksilver are unchanged. The market in potash compounds is very quiet, prussiate being easy at a fractional reduction; whilst chlorate, which earlier in the week saw still lower quotations, closes at last week's bottom prices. Soda compounds are unchanged. Details:—

ACID BORACIC.—Last week's prices still hold. Crystals being quoted at 80s.; powdered, 32s.

ACID CITRIC.—At the commencement of the week a very steady demand was shown, with tendency to advance. At the close, however, it is offered at last week's rates of 1s. 1½d. to 1s. 2d.

ACID OXALIC.—In steady demand at unaltered rates. Manufacturers still quote 3½d. ex rails.

ACID TARTARIC.—No improvement is to be recorded, as the market remains very quiet, and not much business passes at the quoted rates. English manufacturers still quote at 10½d. to 11d.; foreign ditto, 10½d.; powder, 10½d.

AMMONIA SALTS.—*Sulphate*: The market has been very firm and continually on the rise during the week. At the close it is very steady. Grey, 24 per cent., is now returned at £11 7s. 6d. *Carbonate*: The advance in sulphate has not been accompanied by any change here, last week's quotations of 3½d. to 3½d. being unaltered. *Sal Ammoniac*: Last week's rates are unaltered. First are still returned at 89s.; seconds at 87s.

ASHES.—Though very steady, the last quotations still hold. *American* is worth 40s., with pots at 28s.

ARSENIC.—The market remains very firm, the supplies still being but small. Quoted at 14s. 9d. to 15s.

BLEACHING POWDER.—Not much doing, but the prices are well maintained. Quotations, 8s. 8d. to 8s. 6d.

BORAX.—Very weak market. As was to be expected from last week's returns, the prices are now somewhat reduced, and it is now being quoted at 19s. 6d. for crystals, and 20s. 6d. powdered.

CREAM OF TARTAR.—Has remained very steady during the week, and the closing prices indicate an improved market. White crystals are now returned at 63s. 6d., with powdered at 65s. 6d.

MERCURIALS.—Unaltered. Quantities up to 28 lbs. are still quoted:—*Calomel*, 2s. 9d.; *red precipitate*, 3s.; *white ditto*, 8s.; *corrosive sublimate*, 2s. 5d.

POTASH COMPOUNDS.—Weak market generally. *Prussiate* very easy at a fractional fall, now quoted at 9½d. *Chlorate* has again fluctuated, but always falling. It touched 4½d. earlier in the week, but closes at 4½d. *Bichromate* remains unchanged at 4½d. to 4½d.

QUICKSILVER.—Quiet, with unchanged quotations. Importers' prices are still £6 10s., and in second hands the rates are £6 9s. 6d. to £6 10s.

SODA COMPOUNDS.—Quiet and unchanged. *Caustic Soda* remains easy at £8 for 70 per cent., with £1 less for 60 per cent. *Crystals* unchanged at 38s. *Bicarbonate* remains at £7 5s. (London.)

THE DRUG MARKET.

ALOES.—Quiet, but quotations are well maintained. *Cape* is worth about 28s. 6d. for good hard bright to fine; whilst the coarse drossy qualities are selling at 18s.

BUCHU.—Short leaves sold at the last auction at somewhat higher prices, the quotations being 3½d. for green and 2½d. for yellow. Not much demand for long leaves, which are worth 3½d. to 4d. for fair qualities.

CAMPHOR.—The market remains very firm. It is now quoted at 105s. c.i.f. The prices for the English refined article are now 1s. 5d. for bells and 1s. 7d. for squares in quantities of half a ton.

CASCABELLA.—Not much doing, [but good quality bark would command a good price.

COCAIN.—Very firm, the quotations being 18s., with a likelihood to advance, as the impure article is somewhat scarce.

COCHINEAL.—The market is very firm, and no sales are reported. Black is worth 1s. 4d., and silver 1s. 4½d.

COLOCYNTH.—In good demand, the prices indicating an advance on those of the last sales. Good pale balls of Turkey are now quoted at 1s. 8d.

HONEY.—Very steady. Fair Californian is worth 31s. 6d. with darkish Jamaica at 20s. to 22s.

IPECAC.—Very firm. Fine annulated Rio root is worth 5s. 2d., whilst Carthagena is in improved demand. Sales of first-class root being reported at 8s. 10d., with seconds at 8s. 7d.

JALAP.—In fair demand. A sale of ten bales of fair Vera Cruz at 1s. 8d. is reported.

MENTHOL.—Very firm. It is now quoted at 14s. 6d. January delivery. Spot quotations have also advanced, 15s. 6d. to 16s. being the figure.

MORPHIA.—Remains unchanged at 5s.

OILS (Essential).—*Eucalyptus* is in very strong demand, and business has been brisk at greatly increased rates. Sales of the *Globulus* oil (Platypus brand) are reported at prices ranging from 2s. 6d. to 2s. 9d., indicating an advance of 6d. *Cumming's Oleosa* oil is quoted at 2s. 3½d., and the native bear brand at 2s. For other qualities 1s. 8d. to 1s. 6d. is paid for grades which last week only commanded 10d. to 1s. This increased demand is, of course, attributable to the prevalence of influenza, and prices will probably reach higher figures. *Aniseed* oil is somewhat easier; 5s. 9d. has been accepted during the week, but 5s. 10d. would more represent a fair quotation. *Peppermint*: The Japanese oil is dearer. 40 per cent. oil is quoted at 8s. 6d. to 8s. 9d. on the spot, with *dementholised* oil at 6s. 9d. to 7s. *H. G. Peppermint* oil is quoted at 9s. 9d. to 10s., and *Cassia* at 4s. to 4s. 6d.

OILS (fixed) AND SPIRITS.—*Castor Oil.*—In dull demand. Forty cases of second quality Calcutta oil were sold at the auctions, the rate being 2½d. *Cod-liver oil.*—In very steady demand, the prices tending higher. The closing quotations for new seasons oil are now 195s. at Bergen. Spot quotations for prime 1894 oil are 170s., and for finest non-congealing new oil, 210s. *Peach kernel oil*: Last week's quotations are maintained, the prices for half-ton quantities still being 8d. *Linseed*: Has been continually on the down line, the prices showing a reduction of about 17s. 6d. Closing rates are £20 7s. 6d. to £20 10s. *Cotton*: Remains steady in quiet demand at last week's rates. Refined oil is still quoted at £17 5s. to £18 5s., according to brand. *Coconut*: Rather easy. *Ceylon*: Is worth £22 15s. to £23. *Ochin*: £25. *Mauritius*: £23. *Rape*: Fairly steady. Refined oil is quoted at £21 15s. to £22. *Turpentine* is very firm, with steady increase in prices. *American spirit* is now worth 22s. 8d., which shows an advance of 3d. to 6d. on last week's rates. *Petroleum*: The last quotations have not been maintained, although earlier in the week it touched

5jd. Since, however, it has been continually easier, the closing quotations for the American oil being 4jd., and for the Russian 4jd. *Petroleum spirit*: Ordinary 7d., deodorised, 7jd. to 7jd.

OPIMUM.—No change of importance has occurred during the week, and last week's quotations remain unchanged. The stocks in both London and Smyrna are, however, very low, and should the weather in the opium-growing districts turn out unfavourable prices will be considerably raised. Quotations:—*Turkey*: Soft shipping description, 12s. to 12s. 6d.; best "druggists," 10s. to 10s. 6d.; seconds ditto, 9s. to 9s. 6d. *Persian*: 11s. 9d. to 12s.

QUININE SULPHATE.—During the past week business in the best German makes has been extremely quiet. There have been some sales earlier at 11jd., but at the close 11jd. is the quotation with little doing at that figure.

SENSEGA.—In much better demand. 1s. 5d. is now readily paid, whilst 1s. 6d. is now asked for good bright quality root.

SHELLAC.—There is but little business doing. Some small sales of T.N. orange are reported at 110s. At the Auctions, on the 26th, there was but a small supply, no Garnet being offered, and Second Orange meeting with but poor demand. Of 815 cases offered 118 sold. Second Orange was worth 105s. to 107s. Fair A.C. Garnet has since been selling at 104s.

SARSAPARILLA.—Very steady. At the last sales Honduras good quality fetched 1s. 8d., with fair mixed Jamaica, 1s. 8d., and native damaged at 7d.

WAX (Bees).—Is very steady at increased prices. Good pale Jamaica wax is worth £8 7s. 6d. to £8 12s. 6d.

Obituary.

RICHARD PARKINSON.

We regret to have to record the death on February 21 of Richard Parkinson, Chemist and Druggist of Liverpool, aged 66 years. Mr. Parkinson was for many years associated with the Society, in whose work he manifested considerable interest. From 1889 he acted as the Society's representative in Liverpool, and only retired in October last from a sense of failing energies. During his fifty years' residence in Liverpool Mr. Parkinson did much good work in his quiet unassuming way, and his co-workers in the various local educational and religious movements with which he was identified will keenly feel his loss. He was also treasurer of the Liverpool Chemists' Association. Graceful tribute to the excellent qualities of the deceased and to the high place he held in the esteem of his fellow-citizens was publicly rendered by the Rev. W. J. Adams, of St. Augustine's Church, in the course of a memorial sermon. Among those present at the interment at Everton were Mr. J. Smith (the Society's present local secretary), A. T. Buck (assistant local secretary), and many other fellow-craftsmen.

Notice has also been received of the death of the following:—

On February 3, Joseph Brown, Chemist and Druggist, Brownlow Hill, Liverpool. (Aged 47.)

On February 14, Nathan M. Green, Chemist and Druggist, Lindley. (Aged 45.)

On February 16, W. S. Edwards, Pharmaceutical Chemist, Great Dover Street, London. (Aged 84.) Mr. Edwards had been a member of the Pharmaceutical Society since 1853.

On February 21, William E. Lowe, Pharmaceutical Chemist, London. (Aged 73.) Mr. Lowe had been a member of the Pharmaceutical Society since 1853.

On February 22, R. C. Pars, Chemist and Druggist, Thrapston. (Aged 69.) Mr. Pars had been a member of the Pharmaceutical Society since 1869.

On February 24, William Geddes, Chemist and Druggist, Oldham. (Aged 67.)

Personal and Trade Notes.

In view of the approaching revision of the British Pharmacopoeia, Messrs. Helbing and Passmore, 63, Queen Victoria Street, E.C., have published a pamphlet containing suggestions as to what the official requirements for essential oils should be.

By a compositor's blunder, the address of Messrs. Llewellyns and James, makers of Morris and Wethered's patent stills, was printed last week as Halifax instead of Bristol.

A trial of "Volara" tea for invalids, supplied by the United Kingdom Tea Company, Ltd., Mincing Lane, E.C., confirms the statement that it is remarkably free from tannin. The infusion is devoid of astringency, and possesses a delicate flavour which will be appreciated by the teadrinker whose palate has not been spoiled by the nameless beverages too frequently supplied.

At the eighteenth ordinary general meeting of the Sanitas Company, Limited, on February 26, a dividend of 18½ per cent. was declared, and an informal expression of opinion was given in favour of the issue of more capital.

A modern pharmacy has been fitted for Mr. Ellis Jones, Kingswood, Bristol, a leading feature being an elaborate dispensing screen. The work has been carried out by Messrs. Vale Brothers, Weston-super-Mare.

The Committee of the Sheffield Trades and Industries Exhibition, Drill Hall, Sheffield, has been pleased to award the gold medal for excellence of aerated waters to syphons to Mr. J. F. Eardley, pharmaceutical chemist and mineral water manufacturer, Glossop Road, Sheffield.

A dividend of 10 per cent. has been declared by the Briton Fern Chemical and Manure Company, Ltd.

Patent Specifications.

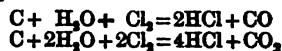
PUBLISHED DURING FEBRUARY.

Sodium or potassium cyanide (A. E. Hetherington and E. K. Muspratt).—In the case of sodium cyanide, anhydrous sodium, ferrocyanide is fused with an alloy of lead and soda prepared as described in specification No. 5831 of 1894 (see last week's Journal). The alloy is first melted under a covering of sodium cyanide to prevent oxidation, and the ferrocyanide is added in small portions at intervals. The sodium cyanide produced by the action forms a cake above the iron and lead which are formed as bye products. Potassium cyanide is similarly prepared. No. 5832 of 1894.

Spectacles (J. Binton).—The portions which rest upon or clasp the nose are made of india-rubber tubing or the like, preferably closed at the ends and inflated with air. No. 6127 of 1894.

Trusses, etc. (F. T. Simmons).—Abdominal supports and trusses are fitted over the whole inner surface of the spring with a pneumatic cushion inflated through a screw-valve as usual. No. 16,086 of 1894.

Hydrochloric and hydrobromic acids.—(R. O. Loreau).—The chlorine obtained as a bye-product in the electrolytic production of metals, etc., is converted into hydrochloric acid by passing it in admixture with steam through a clay retort filled with charcoal, coal, or coke, and heated to dull redness. The reactions which occur are said to be as follows:—



Hydrobromic acid is similarly prepared. No. 25,073 of 1894.

Electrolytic reduction of metals (T. T. Oliver).—The mineral or compound to be reduced is first fused in an electric furnace, and is then charged with positive electricity and passed over a solid metal surface charged with negative electricity. The metal deposits on the negatively charged surface and the waste material passes away as slag. No. 25,080 of 1894.

New Companies Registered.

[Compiled from the *Financial News*.]

AROSCOPIC LENS COMPANY, LIMITED.—Registered by J. B. Purchase, 11, Queen Victoria Street, E.C., with a capital of £1000 in £1 shares. Object, to carry on business as manufacturers of and dealers in electrical, medical, and optical instruments; as advertisement agents, printers, etc., in all their respective branches. Registered without articles of association.

PASTEUR ANTHRAX VACCINE (UNITED) STATES AND CANADA) COMPANY, LIMITED.—Registered by Renshaw, Kekewich and Smith, 2, Suffolk Lane, E.C., with a capital of £25,200 in £1 shares. Object, to adopt and carry into effect an agreement, made January 18, 1895, between this company of the one part and H. Sorby of the other part, and to propagate the Pasteurian methods of vaccination. The first directors—to be not less than three nor more than nine—are to be elected by the signatories. Qualification, £100. Remuneration, £60 each per annum, and a percentage of the profits, divisible.

ANGLO-HUNGARIAN AND TRANSYLVANIAN COMPANY, LIMITED.—Registered by Saunders, Hawkford, and Bennett, 68, Coleman Street, E.C., with a capital of £100,000 in £1 shares. Object, to adopt and carry into effect an agreement, made February 5, 1895, between the Transylvanian Development, Limited, of the one part and E. Worthington Pullin, on behalf of this company, of the other part; to acquire any properties, concessions, options, undertakings, and businesses in Hungary, and to carry on mining, exploring, and trading operations in Hungary or elsewhere; as engineers, chemical manufacturers, oil refiners, planters, exporters, merchants, all kinds of agency business; to construct and maintain rail and tram roads, harbours, wharves, piers, docks, etc. The first signatories are:—

	Shares.
E. J. Wright, 6-8, Lime Street, E.C.	1
A. W. Arup, Brooklands, South Benfleet, Essex	1
R. J. Cork, Leadenhall House, E.C.	1
J. Atkin, 17, Burgoynes Road, Harringay, N.	1
M. H. Hawes, 114, Stenarn Road, Clapton	1
C. H. Bennett, 62, Victoria Street	1
E. H. Wright, 58, Oakfield Road, Clapton, N.E.	1

The first directors—to be not less than two nor more than ten—are to be nominated by the signatories to the memorandum. Qualification, 100 shares. Remuneration, £100 each per annum and a percentage of the profits, the latter divisible. Registered office: 68, Coleman Street, E.C.

UNIVERSAL GAS LIGHT AND FUEL SYNDICATE, LIMITED.—Registered by Dollman and Pritchard, 39, King Street, E.C., with a capital of £20,000 in £1 shares. Object, to carry on business as colliery proprietors, gas makers and suppliers, coke makers, miners and smelters, chemical manufacturers, steel converters, ironfounders, etc. The first directors—to be not less than three nor more than five—are to be nominated by the signatories. Qualification, 1 share. Remuneration to be fixed by the company. Registered office: 3, George Yard, Lombard Street, E.C.

NITROGEN COMPANY, LIMITED.—Registered by W. E. Stone, Billiter Square Buildings, E.C., with a capital of £2,000 in £1 shares. Object, to adopt and carry into effect an agreement, made February 15, 1895, between H. Wiskeman of the first part, F. J. Knight and F. Walters of the second part, and V. A. Richards, on behalf of this company, of the third part, and, generally, to carry on business as manufacturers of nitrogen.

New Books and New Editions.

Publishers are invited to forward full particulars of new publications, including price.]

THE BOOK OF MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS. By R. E. SCORSEBY JACKSON, M.D., F.R.S.E. Fifth Edition. Revised by F. RUTHERFORD HILL and RALPH STOCKMAN, M.D., F.R.C.P.E. Pp. xviii., 748. (James Thin, Edinburgh).

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*.] *Where complete Specification accompanies Application, an asterisk is suffixed.*

No. 1959.—Marius Otto and Albert Verley, 47, Lincoln's Inn Fields, London.—Improvements in the manufacture of perfumes. January 28, 1895.

No. 1967.—Charles Henry Huntley, 38, Great Dover Street, London.—Improvements in recovering salts or salines from solutions.* January 28, 1895.

No. 2067.—Jean Billard, 45, Southampton Buildings, Chancery Lane, London.—Improvements in and relating to photographic frames or apparatus for use in the reproduction of drawings. January 29, 1895.

No. 2091.—Léopold Landau, Norfolk House, Norfolk Street, London.—Improvements in safety stoppers for bottles and the like.* January 30, 1895.

No. 2199.—Arthur Senior, 55, Chancery Lane, London.—Improvements in measuring tape, or apparatus for measuring quantities of spirits or other liquids. January 31, 1895.

No. 2220.—Walter Henry Jones, 23, Coleman Street, London.—Improved case or holder for bottles.* January 31, 1895.

No. 2240.—Rudolph Bossert Docetti Walker, 41, Reform Street, Dundee.—Improvements in apparatus for spraying or diffusing liquids. February 1, 1895.

No. 2296.—Walter Beacall Bishop and Alfred Bishop, 15, Chancery Lane, London.—Improvements in stoppers for bottles and other receptacles by which such stoppers are applicable to measuring liquids or powders. February 1, 1895.

No. 2305.—Frederic Eugene Ives, 47, Lincoln's Inn Fields, London.—Improvements in photochromoscopes and photochromoscope cameras. February 1, 1895.

No. 2363.—Auguste Hilaire Petit, 8, Quality Court, Chancery Lane, London.—Improvements in or relating to photographic printing frames. February 2, 1895.

No. 2452.—Johann Klein, 823, High Holborn, London.—Improvements in or relating to graduating or cooling apparatus and processes. February 4, 1895.

No. 2457.—William Cooper, Carlton Street, Castleford, Yorks.—An improved method of forming air-tight jars or bottles. February 5, 1895.

No. 2509.—Hermann Louis Christian Ausbattel, 22, Glasshouse Street, Regent Street, London.—A new or improved pneumatic releasing device for camera shutters. February 5, 1895.

No. 2540.—Edward Jamison O'Brien, 18, Buckingham Street, Strand, London.—Improvements in apparatus for separating fluids from solids.* February 5, 1895.

No. 2544.—Alfred Julius Boulton, 823, High Holborn, London.—Improvements in or relating to photographic cameras (*Alfred Constantine Kemper, United States*). February 5, 1895.

No. 2656.—Albert Knoll, 46, Lincoln's Inn Fields, London.—New or improved manufacture or production of crystallised compounds of antipyrine.* February 6, 1895.

No. 2678.—James Ashford, 179, Aston Road, Birmingham.—Improvements in hand cameras. February 7, 1895.

No. 2715.—Albert Argent Arahner, 55, Chancery Lane, London.—Improvements in or relating to flash lamps used for photographic or other purposes. February 7, 1895.

No. 2747.—Reginald Blackwell Breidenbach, 151, Strand, London.—Improvements in and relating to perfume vaporisers and the like. February 7, 1895.

No. 2767.—Edward Anthony Ind, 8, Howard Street, Gloucester.—A new and improved attachment for taking stereoscopic photographs of still life with a single camera and lens. February 8, 1895.

No. 2786.—Ronald Gale, Perth House, Chestnut Grove, New Malden, Surrey.—Improved air-tight screw cap, for bottles, flasks, jars, oil cans, and kegs of every description. February 8, 1895.

No. 2925.—John Alderson Clarkson, 54, Fleet Street, London.—Improved device for separating liquids of different densities. February 9, 1895.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SUNDAY, MARCH 3.

Sunday Lecture Society, at 4 p.m.

"Plants and their Insect Visitors" (Illustrated), by O. W. Kimmins.

MONDAY, MARCH 4.

Royal Institution of Great Britain, at 5 p.m.

General Monthly Meeting.

London Institution, at 5 p.m.

"Theory and Practice of Protective Inoculations" (Illustrated), by Edward E. Klein.

Society of Chemical Industry (London Section), at 8 p.m.

"The Durability of Pigments derived from Coal Tar Products," by A. P. Laurie.

"The Hermite System of Sewage Purification," by Sir Henry Roscoe and Joseph Lunt.

TUESDAY, MARCH 5.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

Royal Institution of Great Britain, at 8 p.m.

"Internal Framework of Plants and Animals" (Eighth Lecture), by Professor Charles Stewart.

Society of Arts (Foreign and Colonial Section), at 8 p.m.

"Colonies and Treaties," by Sir Charles M. Kennedy.

Aberdeen Chemists' and Druggists', Assistants', and Apprentices' Association, at 9.15 p.m.

Paper by Andrew Craig.

WEDNESDAY, MARCH 6.

Pharmaceutical Society of Great Britain, at 11 a.m.

Council Meeting.

Pharmacy Club, at 6.45 p.m.

Meeting at the Café Royal, Regent Street.

British Pharmaceutical Conference, at 4.30 p.m.

Meeting of the Executive at 17, Bloomsbury Square.

Geological Society.

"A New Ossiferous Fissure in Creswell Crags," by J. D. Duckworth and F. E. Swainson.

"Notes on the Chemical Composition of some Oceanic Deposits," by Professor J. B. Harrison and A. J. Jukes-Browne.

Society of Arts, at 8 p.m.

"Cider," by C. W. Radcliffe Cooke.

THURSDAY, MARCH 7.

Royal Institution of Great Britain, at 8 p.m.

"The Stuart Monarchy," by S. R. Gardiner.

Linnean Society of London, at 8 p.m.

"On the Genus Cupressus," by Dr. Maxwell T. Masters.

"On the Insects, Arachnida and Crustacea, collected during Mr. T. Bent's expedition to Hadramant, Arabia," by W. F. Kirby, Chas. Gahan, and R. J. Pocock.

Chemical Society, at 8 p.m.

"Dimethylketohexamethylene," by Dr. Kipping.

Chemists' Assistants' Association, at 8 p.m.

Annual Dinner.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

Exhibition of Lantern Slides by Messrs. J. B. Burn, J. Jones, R. H. Mitchell, J. Penketh, Geo. R. Tharratt, and H. Wyatt, junr.

Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.

"The Anatomy of Expression," by Dr. T. H. Bryce.

FRIDAY, MARCH 8.

Royal Institution of Great Britain, at 9 p.m.

"The Physical Work of von Helmholtz," by Professor A. W. Rücker.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.

"Elderberry Juice as an Indicator," by W. B. Cowie.

"Types of Branching and Inflorescence," by W. B. Cowie.

"Strength of Spirit *Etheris Nitrosi*," by Walter Smith.

SATURDAY, MARCH 9.

Royal Institution of Great Britain, at 8 p.m.

"Waves and Vibrations" (Second Lecture), by Lord Rayleigh.

Sheffield Microscopical Society, at 8.30 p.m.

"Modern Microscopy," by J. N. Cooombe.

Pharmaceutical Football Club v. Clissold at Wornah Farm, Shepherd's Bush. Commence at 3.15 p.m.

Trade Marks Applied For.

[Compiled from the *Trade Marks Journal*.]

188,665.—"Aurarhyd."—MEDICINE FOR HUMAN USE. Edward Siegfried Hermes, trading as Seymour Hamilton and Co., 6, Farleigh Road, Stoke Newington, London, N., manufacturing chemist. November 12, 1894.

188,590.—VOGUE.—Device of a girl standing in a V. All goods included in Class 3.—Mackenzie Drug Company, 9, Carew Road, Thornton Heath, London, S.E. November 12, 1894. The essential particular is the device.

184,405.—RETIRBULAS, and other wording on an oblong label. A medicine for human use, for the relief of toothache and arrest of decay of the teeth.—Charles Henry King, 1484, Fenchurch Street, London, E.C. December 24, 1894. The essential particular is the word *Retirbula*.

184,580.—Device of a balloon and name and address of applicants on a black and white label. Chemical substances prepared for use in medicine and pharmacy.—The Gas Light and Coke Company, Beckton, London, E. December 31, 1894.

184,581.—BENZINE.—Device of balloon and wording on a black and white label. Benzine (included in Class 4) for cleaning purposes.—The Gas Light and Coke Company, Beckton, London, E. December 31, 1894. The essential particular is the combination of devices.

188,632.—POTENIC TABULES.—Device of man in armor and devices on shield. Tabules, being medicines for human use.—Watson and Wates, 93, Leadenhall Street, London, E.C. November 8, 1894. The essential particular is the device.

184,001.—Device of cross keys, with the words *cross keys brand*. Chemical substances prepared for use in medicine and pharmacy, but not including sugar of milk, and not including any goods of a like kind to sugar of milk.—Hodgson and Simpson, Calder Bow Works, Wakefield, Yorkshire. November 26, 1894. The essential particular is the device.

Notices to Contributors.

* * Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication is desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinion expressed.

To ensure accuracy, all chemical formulae, and scientific and proper names, should be written or printed with extra care; whilst if names of plants and animals are underlined, and generic names alone commenced with capital letters, much inconvenience will be obviated.

When illustrations are necessary, pen and ink drawings, consisting entirely of clean and sharp lines—and, preferably, twice the required size—must be supplied not later than a week before the proposed date of publication.

Notes.

EVENING MEETING IN LONDON.—At the evening meeting of the Pharmaceutical Society at 17, Bloomsbury Square, W.C., on Wednesday next, a paper will be read by Mr. R. A. Cripps, entitled "Standardised Preparations of Belladonna," and Mr. J. C. Umney will contribute one, on "*Empleurum serrulatum*." The chair will be taken by the President at 8 p.m.

ANNUAL DINNER OF THE PHARMACEUTICAL SOCIETY.—The preliminary arrangements in connection with this dinner will be made at a meeting to be held on Wednesday next, at 17, Bloomsbury Square, at 11.30 a.m., when the President will take the chair.

BRIXTON AND CLAPHAM CAMERA CLUB.—This is one of the most flourishing of the suburban photographic societies, and its fifth annual exhibition will be held at Brixton Hall, Acre Lane, S.W., from 26th to 30th inst. Owing to the success attending this exhibition during the last two years, it has been now decided to add two open classes for prints and lantern slides, and lantern entertainments will be provided each evening. The president of this society is Dr. Reynolds, F.R.G.S., and local pharmacy is well represented amongst its members. Mr. F. W. Levett, of 11, Corrance Road, Acre Lane, is the hon. sec.

BRITISH INSTITUTE OF PREVENTIVE MEDICINE.—Dr. Armand Ruffer has tendered his resignation as Director of the British Institute of Preventive Medicine.

TRADE IN THE FAR EAST.—In order to foster and facilitate British trade with the important and growing market of Japan, the proprietors of the *British Trade Journal* have decided to issue an edition of their journal in the Japanese language. The present idea is to issue it quarterly, and a representative of the journal is leaving for Yokohama to make the necessary arrangements. During his journey he will communicate to our contemporary a series of letters from various commercial centres in the Far East, particular attention being given to the trading possibilities of Japan after the war. It is to be hoped that information respecting the drug trade will be included, as in these times of commercial depression it is more important than ever that fresh channels of trade should be opened and developed.

ULTRA-VIOLET PHOTOGRAPHIC SPECTRUM.—According to *Nature*, Dr. Schumann has now improved his plates and "vacuum spectrograph" so as to obtain satisfactory representations of the ultra-violet spectrum in a few minutes. The spectra of cobalt, iron, aluminium, zinc, and cadmium have been considerably extended beyond 170 m μ , and the hydrogen spectrum also shows a further lengthening.

CHEMISTS' ASSISTANTS' ASSOCIATION.—The seventeenth annual dinner of this Association was held on Thursday, at the Cannon Street Hotel, the chair being taken on the occasion by Mr. Walter Hills, member of the Pharmaceutical Council.

UNDERGROUND EXPLOSIONS IN LONDON.—A curious effect of electrolytic action in connection with the St. Pancras electric lighting mains, which rest on porcelain or stoneware insulators, is the formation of a certain amount of metallic sodium. This occurs in an incrustation composed mainly of copper oxide and caustic soda, and it is supposed (see p. 80) that some of the recent underground explosions may have been caused by the metal coming in contact with water, and so igniting the mixture of illuminating gas and air present in the water-tight culverts.

STERILISATION OF WATER.—The Paris correspondent of the *Lancet* states that M. Frémont has proved that, by maintaining water at a temperature of 80° C. for twenty minutes, all the pathogenic microbes it may have contained will be destroyed, without any loss of the gaseous or saline contents of the water, and without modification of its flavour.

LIQUEFACTION OF GASES.—Professor Dewar, in last week's *Nature*, again repels Mr. Pattison Muir's attack, and shows the weakness of the charges brought against him by the latter. He also protests against Mr. Muir's interference in the matter.

NEW METRIC STANDARDS.—The President of the Royal Society, accompanied by several members of the Council, visited the Standards Department of the Board of Trade on February 21, and inspected some new metric standards. These included a "line" standard metre measure (*mètre-à-trait*), a kilogramme weight, and an "end" standard metre (*mètre-à-bouts*). The measures are made of platinum, alloyed with 10 per cent. of iridium, and the "line" metre has been verified to one part in a million ($\pm 0.1 \mu$), whilst the "end" metre has a probable error of $\pm 0.3 \mu$. The kilogramme is a cylinder of the same iridio-platinum alloy, the height and diameter of which are equal (39 mm.), and has been verified with a probable accuracy of 0.002 part in a million.

LONDON COUNTY COUNCIL.—Amongst the successful candidates at the recent election for membership of this body, are Major Clifford Probyn, J.P., who heads the poll in the Strand division, and Mr. T. H. W. Idris, who occupies a similarly honourable position in North St. Pancras. In both cases the member is re-elected.

PLANT HOUSES AT KEW.—It is reported that experiments in substituting white glass for green in the plant houses at Kew Gardens have proved so successful—the improvement in the growth of the plants being very marked—that it is now intended to abandon the use of green glass entirely in future.

LIVERPOOL CHEMISTS' ASSOCIATION.—The members of this Association held their annual dinner at the Adelphi Hotel, Liverpool, on Tuesday, March 12, at 7.15 p.m. Applications for tickets should be addressed to the honorary secretary, Mr. A. S. Buck, 179, Bedford Street, Liverpool.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

BEECHAM v. HARGRAVE AND SANDERS.—In the Chancery Division on March 1, before Mr. Justice North, Mr. Eve, who appeared for Messrs. Beecham asked for an injunction to restrain Messrs. Hargrave and Sanders, chemists and druggists, carrying on business at No. 1, Booth Street, Hulme, Manchester, and also their servants and agents, from selling or offering for sale as Beecham's pills any pills not of the plaintiff's manufacture. The learned counsel said that the motion was not opposed, but the defendants, who appeared by his friend, Mr. Martelli, were willing to submit to a perpetual injunction in the terms of the notice of motion, and to pay an agreed sum for damages and costs. His lordship granted the injunction as a consent order accordingly. — *Morning Advertiser*.

POISONING BY MAZARINES.—A fearful retribution has overtaken some post-office clerks at Tarbes, in the region of the Pyrenees, who were guilty of opening a parcel passing through their office and stealing some cakes out of it. The cakes were of the kind called "mazarines," and they seem to have been shared out equally by four men on duty. Directly they tasted them three of the clerks felt a burning sensation in the throat. They swallowed very little of the food therefore, and they went and rinsed out their mouths with cold water. The fourth man, remarking that his share was "not so bad," ate the whole of it. Soon after he went home his hands and feet became icy cold, and he had fearful internal pains. He fell heavily on the floor, and was taken up in a dying state. The others did not suffer so severely. Inquiries which have been made resulted in the discovery that the cakes had had strychnine placed in them, and were addressed to a M. Cabraró at Cienfuegos, near Bagneres de Bigorre, by a young usher in a school named Contre, who owed him a grudge. Contre, on being arrested, made a full confession. — *Daily News*.

MYSTERIOUS DEATH FROM POISONING.—A mysterious case of death from poisoning engaged the attention of a coroner's jury at Brighton on Saturday, March 2. The deceased was Mary Elizabeth Leclerc, of 129, London Road, the wife of a teacher of languages and painting, who described himself as a descendant of a family of Spanish grandees. She was sixty years old, and the husband appeared to be about half that age. On Friday morning, when he went to his wife's bedroom, he found her lying on the bed fully dressed, and dead. Without calling the servant, who was ill in bed with influenza, Mr. Leclerc at once ran for a doctor. When the medical man, Mr. Tocher, arrived, he found that Mrs. Leclerc had been dead for several hours, and under one of her arms he discovered a small bottle containing a dark-coloured fluid. What that fluid was, however, he was unable to determine, though he described himself as a chemist of some experience. On making a post-mortem examination he satisfied himself that death had arisen from some corrosive poison of an exceedingly powerful nature, the stomach being, as he put it, reduced to a jelly. His opinion was that the fluid in the bottle found on deceased was not a corrosive poison, and was consequently not the poison that had caused death; and the foreman of the jury, a chemist, shared that belief. A search at the premises had, however, failed to reveal any trace

of a corrosive poison. Deceased, it transpired, had married Mr. Leclerc about eighteen months ago, and had made a marriage settlement upon him. One of the jury said he had always regarded Mrs. Leclerc as a good business woman; but the husband and the servant, as well as a charwoman who worked at the house periodically, said that she was subject to delusions. Her delusions were that she heard voices; and her jealousy of the servant in connection with her husband was attributed by the witnesses to infirmity of mind. The servant represented that she had had to endure much from her mistress, and both she and the charwoman said that deceased had threatened to commit suicide. Indeed, on one occasion the charwoman had taken from Mrs. Leclerc a knife with which she had threatened to take her life.—After a long inquiry it was decided that Mr. Tocher should make a further investigation with another medical man, and that, if the poisoning still remained a mystery, the stomach and the bottle of unknown fluid should be submitted to the Government analyst. With this object in view, the inquiry was adjourned till Monday, March 11. — *Daily News*.

STREET EXPLOSIONS IN LONDON.—In a letter addressed by the Board of Trade to the Chairman of the Electric Lighting Committee of the St. Pancras Vestry, it is stated that Major Cardew, the electrical adviser of the department, has discovered, in his investigations into the recent explosions in the street boxes used for electrical supply in St. Pancras, that a remarkable deposit on some of the insulators contained a considerable quantity of the metal sodium. It is pointed out that "the presence of this metal, which is highly inflammable by contact with water, appears to be so grave a source of danger, and to afford so reasonable an explanation, in connection with the accumulation of escaped coal gas, of the several explosions which have recently occurred, that it devolves upon the Board of Trade, without any delay whatever, to investigate the causes of the deposit of this substance, with a view to its prevention, and in this investigation they have asked for the assistance of the Royal Society and of the Institution of Electrical Engineers. In the meantime, in order to prevent as far as possible the recurrence of similar explosions, the Board of Trade would strongly urge that the Vestry, through their Electrical Committee, should immediately (1) provide a thorough system of ventilation for their conduits and street-boxes; (2) reduce as far as possible the space in their street-boxes within which an accumulation of gas can occur; (3) make a thorough inspection of their mains, and remove the above-mentioned deposit wherever it is found to exist."

TARTARIC ACID FOR SODIUM SULPHATE.—In the Queen's Bench Division, on March 5, the case of Blyton v. Townson and another was heard. This was an action brought by Mr. George Blyton, an engineer employed by the North London Railway Company, against the defendants, Messrs. Townson and Mercer, who carry on business in Blabopgate Street, E.C. to recover damages for injuries which, he alleged, he had sustained through their negligently supplying him with tartaric acid instead of sodium sulphate. There was no defence to the action, as the defendants admitted that a mistake had been made, and that the plaintiff had been supplied with tartaric acid instead of sodium sulphate, and the case came before the Court only for the assessment of damages. It appeared that in June last the plaintiff, who suffered from attacks of gout, sent round to the defendants, with whom he was in the habit of dealing, for sodium sulphate, and when he got home from business, he

having had it mixed by his wife, swallowed it. Directly after he had swallowed it he found that something was wrong. He began to vomit immediately, and he became so ill that he had to keep his bed for some days. He alleged that the tartaric acid had affected his eyesight and memory. In cross-examination the plaintiff said that he had never suffered from inflammation of the eyes caused through gout. He had been laid up with gout, but never for more than two days at a time. At the conclusion of the evidence, the Jury awarded the plaintiff £20 damages. As Mr. Justice Cave had left the court when the Jury announced their decision, the way in which judgment should be entered was postponed. — *Standard*.

DRUGGING HORSES IN LINCOLNSHIRE.—At the Horncastle Petty Sessions on Saturday, March 2, Walter Spikings, of New York, in the parish of Coningsby, was summoned for administering poisonous drugs to three horses, the property of Messrs. Sinclair and Son, seed merchants, etc.—The defendant, who pleaded guilty to giving the horses a teaspoonful of black (?) copperas twice a week, was fined £1 10s., and £1 11s. costs, and in default of payment one month's imprisonment without hard labour. — *Nottingham Guardian*.

ANTITOXIN AND DIPHTHERIA.—At the ordinary monthly meeting of the Nanburgh and Blaina District Council, Dr. H. C. Bevan, the medical officer reported an outbreak of diphtheria, and stated that two cases had been fatal. The new remedy antitoxin had been used with great success, but not as a preventative owing to the difficulty of obtaining it. General approval was expressed at the action of the medical officer in introducing the new remedy, and it was decided to write him an official letter expressing the Council's appreciation of his experiments.

PLYMOUTH, DEVONPORT, STONEHOUSE, AND DISTRICT CHEMISTS' ASSOCIATION.—At the usual monthly committee meeting held on March 5, at the Octagon, Plymouth, the following prize scheme was adopted:—Three prizes for practical analytical chemistry, value 10s., 6s. 6d., 3s. 6d., which Dr. Dunn, of the Technical Schools, has kindly consented to conduct; two prizes, value 21s. and 10s. 6d., for best set of mounted specimens, to be collected from April to September; also three prizes, value 10s., 6s. 6d., 3s. 6d. for an elementary botanical examination (the latter given by the President), the whole of which are to be competed for by unqualified members of the junior section only. Mr. John de Turney also intimated that he would be pleased to conduct a class in materia medica monthly for the benefit of the junior section, which was cheerfully accepted. Dr. Dunn was also elected an honorary member of the Association.

WEIGHTS AND MEASURES.—The Select Committee of the House of Commons continued on Tuesday the evidence of Mr. Chaney, of the Standards Department of the Board of Trade. With regard to anomalies still remaining in the markets of the country by custom as distinguished from law, he agreed with the question put by Mr. Stevenson that the butcher's stone weight of 8 lb. is used only between the salesman and the wholesale purchaser, but not in the retail trade. Scotch and Irish miles were not yet obsolete, but the milestones on the roads were in imperial miles. The Board of Trade was empowered to authorise metric weights and measures for manufacturing purposes, but not for retailers. The earliest recorded pound was divided into 15 oss. The English foot had always been divided into twelve parts. Where measures which have become illegal remained in use, the local authority

had power, if it thought fit to exercise it, to interfere. The United States took over the English weights and measures across the Atlantic with the language, and still adhered to the yard measure, the troy pound, and the Winchester bushel as representing units. In England the avoirdupois pound was the unit. The total number of weights and measures rejected as unfit to be stamped were 846,457, while 1,015,000 were returned by the inspectors to the owners to be readjusted.—Mr. Dowson, C.E., chairman of the Executive Committee of the New Decimal Association, attended to explain his views on the system of weights and measures at present in vogue in this country compared with the metric system. The latter system, he said, is now in use in every country in Europe, except Great Britain and Russia and possibly Denmark, and is accepted by 445,000,000 of population. British traders were thus placed at serious disadvantage. — *Daily News*.

SOCIETY OF CHEMICAL INDUSTRY.—At a meeting of the Yorkshire section of the Society of Chemical Industry, held on March 4 at the Queen's Hotel, Leeds, Messrs. Carlton, B. Heal, and H. R. Procter, F.I.C., read communications from the Leather Industries' Laboratory of the Yorkshire College on the analysis of liquors used in chrome tannage. After describing several early and abortive attempts to produce leather by the use of chrome salts (including the Heinzerling process used by the Yorkshire Tanning Company), the American process of Schultz and Zahn was explained, by which enormous quantities of glacé kid and other light leathers are now produced. After mentioning the practical difficulties which arise in carrying out this process, methods of analysis were described by which the course of tannage could be controlled, and considerable economies in bichromate effected. A number of samples of chrome leathers, both of American manufacture, and produced at the Yorkshire College, were exhibited. There was a fairly good attendance of members and their friends. Prior to the meeting of the Provisional Reception Committee discussed, but did not definitely decide upon, arrangements for the forthcoming annual meeting of the Society in the summer, at Leeds. — *Yorkshire Daily Post*.

EDINBURGH ROYAL INFIRMARY DISPENSERSHIP.—At the weekly meeting of the Edinburgh Royal Infirmary Managers on Monday, February 18, Mr. Thomas Alexander, chemist and druggist, at present Registrar, was, on the recommendation of the House Committee, unanimously elected chief dispenser in room of the late Mr. Charles Arthur, at a salary of £100 per year with board and lodgings. It is understood that several dispensers holding the Major qualification were ready to offer their services, but the vacancy was filled without advertising, and without giving such applicants any opportunity of having their claims considered. Mr. Alexander is well acquainted with the work, having previously acted a few years ago as assistant dispenser under Mr. Arthur.

MANCHESTER COLLEGE OF PHARMACY.—On Tuesday evening a conversation was held at the Manchester College of Pharmacy, when Mr. Charles Turner and students entertained a numerous company, about 120 being present. Several of the students gave a highly instructive exhibition of the preparation of pharmaceutical products, while others enlightened their guests by means of the microscope, showing mostly botany and materia medica slides of interest to the pharmacist. In the laboratory were being prepared spiritus ætheris nitrosi, by Mr. Southam; acetic ether, by Mr. Kent; propyl alcohol from fousel oil, by Mr. Carter. A determination of nitrogen in strychnine was conducted

by Mr. D. Hewitt, while Mr. Burch contributed much to the amusement of all by his conjuring entertainment. About twenty microscopes were in use, the greater part the property of students. Mr. Turner contributed his share to the entertainment by giving a lantern lecture on the Cryptogamia, and several of his friends brought exhibits, of which the most noteworthy was the celebrated collection of dried and mounted plants of Mr. Leo Grindon.

PREPARATION OF EXTRACT OF BEEF AT CHICAGO.—In an article in Monday's *Times*, on "Diseased Meat," the following paragraph occurs: "Certain circumstances incidental to the preparation of a so-called 'extract of beef' are almost too revolting for publication. This concoction—'extract of filth' our correspondent calls it—is offered to the public in dainty jars, but is made from the sweepings and drainings of the refuse from the canning rooms and cellars, and is thus something very different from the luscious extract of 'choice cuts of beef' which the consumer may innocently think he purchases. The room in which this delectable compound is prepared is described as containing at times a 'typhoid atmosphere.' 'The smell,' says our correspondent, 'sickened me completely.' The surroundings of the room were filthy. There were several cans lying around containing the extract in its crude state, and several trucks containing the liquid extract of beef. Whilst standing there, two fully-developed rats that had fallen into one of these cans of extract, and had been drowned, were pulled out by the man in charge of this department, just previous to using the contents. How long they had been there cannot be proved, but the fact remains that decomposition had already set in, and the skins and hair were leaving the bodies, and this is an every-day occurrence. 'We understand that material of this description finds its way upon the market under the guise of a name which was well known before the Chicago meat trade came into existence. The question arises, How is the unwary consumer to be protected?'"

A CHEMIST'S ASSISTANT'S MISTAKE.—On February 27 an inquiry was held at the Public Offices, Skelmersdale, near Ormskirk, before the county coroner (Mr. Brighthouse), relative to the death of Henry Whittingham, a master clogger, forty years of age, residing at 19, Sandy Lane, Skelmersdale. Mary Robinson stated that the deceased was her brother. He was single, and lived alone. She called to see him on Monday afternoon about five o'clock. He told her he did not feel very well, and asked her to get him some brandy and a black draught from the chemist's. She took a bottle labelled "black draught," and went to Holt's chemist's shop in Sandy Lane. A youth named Arthur Holt was in the shop, and she asked him for a black draught and gave him the bottle. No one else was in the shop at the time. He took a bottle down from the shop which was labelled "Opil," and poured some of the contents into a measure and then into the bottle which she had given him. She gave the bottle to the deceased, and left him. She was sent for next morning at half-past nine, and found the deceased unconscious. He never recovered consciousness, and died about noon.

Dr. Morris stated that when he arrived at the house he found the deceased in bed quite unconscious. From the enquiries he made, and from an examination of the bottle labelled "black draught," he came to the conclusion that the deceased had taken some kind of poison. He used the stomach pump and all available means to restore him to consciousness, but without avail. There was no doubt that death was due to opium poisoning.

Charles James Henshaw, a qualified chemist, stated that he managed the shop for Mrs. Holt. He had been in charge a month. He believed Arthur Holt had been an assistant in the shop about three years. He saw nothing of the transaction on Monday evening, as he was at tea. The black draught bottle was in its usual place on the shelf—between the bottles containing opium and ammonia. The three bottles were all of the same size and colour. This was their usual position. He had not heard that this was not the first mistake that young Holt had made. He had not heard of people bringing bottles back, complaining they had got the wrong mixture. He knew it had often been suggested that poisons should be kept in blue fitted bottles.

Arthur Holt, after being cautioned by the coroner, elected to give evidence, and stated that he was eighteen years of age. He had been four and a half years in the shop. The tincture of opium had been in the same place on the shelf during the whole of that time. He remembered Mrs. Robinson coming into the shop on Monday evening for the black draught. He turned round and took down what he thought was the black draught bottle. If he gave her opium instead, his explanation was that it was the same sort of bottle, and that when he put up his hand he thought he got hold of the right bottle. He poured the drug into a measure, and then into the bottle she brought with her. He admitted he might have made a mistake.

The coroner, in summing up, said there could be no doubt about the facts, although Holt had, under pressure, and in a half-hearted way, admitted that he might have made a mistake. There was no doubt that he had supplied to Mrs. Robinson instead of a black draught about an ounce of laudanum. There had been great carelessness. There had been carelessness on the part of the manager of the shop in allowing the tincture of opium to be on the shelf near a harmless drug, and there had been gross carelessness on the part of Arthur Holt in supplying a poison instead of a black draught, and thus bringing the deceased to such a sad end. It was for the jury to say whether this carelessness was of such a degree as to justify them in saying it was criminal or only censurable.

The jury retired to consider their verdict shortly after five o'clock, and at a quarter to seven the foreman of the jury (Mr. Thomas Garner) intimated to the coroner that they could not possibly agree upon a verdict.

The coroner adjourned the inquest until Monday March 4, and it is understood that if a verdict is not then arrived at, the jury will be bound over to appear before the judge at the next Liverpool Assizes. The coroner has ordered a post-mortem examination to be made by Dr. Morris.—*Liverpool Post*.

PHARMACEUTICAL FOOTBALL CLUB.—The match to have been played last Saturday between the Pharmaceticals and Clissold was scratched by the latter club.

ROYAL INSTITUTION.—A general monthly meeting of the members of the Royal Institution was held on the 4th inst., Sir James Crichton-Browne presiding. The following were elected members: His Grace the Duke of Newcastle, Lieut.-Col. W. W. Rawes, R.A., Dr. Marmaduke Prickett, Miss C. E. Bradshaw, Mr. Alexander Goschen, and Messrs. G. S. Albright, E. G. Betts, R. A. Bray, M. Bulloch, G. Bywaters, G. F. X. Clay, C. S. Dickson, J. J. Elliott, J. Garvie, F. L. Harris, E. G. Harrison, S. C. Hogg, E. Law, G. H. Ogston, B. P. Portal, S. J. Portal, W. T. Shaw, J. H. Skelton, J. J. Walker, W. H. Walker, and A. F. Walter. The special thanks of the members were returned to Sir William J. Farrer and Mr. John Douglas Fletcher for

their donations to the Fund for the Promotion of Experimental Research at Low Temperatures, and to Mr. Hugh Spottiswoode for a portrait of his father, the late Mr. William Spottiswoode, M.R.I.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.—The annual supper of this Association took place on Thursday, February 28, at the Alexandra Hotel, Bath Street, when about sixty gentlemen were present. The chair was occupied by the President, Mr. W. L. Currie.

The usual loyal toasts were duly honoured, the "Army, Navy, and Reserve Forces" being proposed by Mr. A. Laing in a clever and very humorous speech. Mr. J. Rutherford Hill, Edinburgh, then proposed "The Medical Profession." In the course of his remarks he said pharmacists hoped the day would soon come when a drug shop would be only a place to obtain medicines, and when medical advice would be obtainable only at the residence of the medical practitioner. The great advances made by medical science during very recent years increased the respect with which medical men had always been regarded. The old days of empiricism were passing away, and now, by methods of treatment founded on well-ascertained scientific principles, such terrible scourges as cholera, rabies, tuberculosis, small-pox, and even influenza were being successfully attacked, and would no doubt be finally overcome. He was happy in being able to couple with this toast Dr. D. J. McVail, who, by reason of his eminence in the department of sanitation and preventive medicine, was well worthy to be thus associated.

Dr. D. C. McVail, in responding, said it was an honour to him to reply for his profession to an audience so capable of rightly judging. The public could not judge of the capabilities of a medical man. A practitioner might attain a distinguished position, and have many distinguished patients, and yet the profession might know nothing of such a man that entitled him to high professional rank. No lawyer or divine could attain eminence without merit, but that was the special and peculiar distinction of the medical profession. He agreed with what had been said as to the relationship between medicine and pharmacy. There could be no doubt that, as medical and pharmaceutical science advanced, they would be less likely to tread on one another's toes. There was no circumstance by which he had been greatly astonished. The advance in pharmacy made a higher scientific qualification necessary on the part of the pharmacist, and it was a surprise to him that in connection with the legislation drafted by the Universities Commission the pharmacists of Scotland had not made a claim for university recognition. Under the new regulations they were to grant degrees in science, in agriculture, engineering, sanitary science, and public health, and he wondered that they had never thought of a degree in science for the pharmacists of Scotland. Unquestionably their calling had now become a thoroughly scientific profession, and if they such a society as the Pharmaceutical Society had granted their claims he believed the Commissioners could have given the degrees of B.Sc. and D.Sc. in the department of pharmacy. It was unfortunate at such an opportunity had been missed, but perhaps even yet it was not too late. It might be said that they already had titles in connection with their own Society. But the medical profession had no titles in connection with their various corporations, and yet they liked also to be associated with university. He could not understand how scientific pharmacy itself had been so modest and so humble as not to urge its claims. It was emphatically a large subject, including chemistry, botany, materia medica, and much more, and he thought it was a

great pity that they did not assert their position. He had to thank them for the cordial way in which this toast had been proposed and received.

Dr. A. M. Robertson proposed "The Pharmaceutical Society of Great Britain." He regarded the Society as a most valuable one for chemists and druggists, and he would strongly advise them all to become connected with it. Before many years had passed he believed all the shops in Glasgow would be conducted by qualified chemists. When he came to Glasgow in 1847 he did not think there were more than ten druggists' shops in the whole town, but now the number was largely increased. He regretted that comparatively so few assistants in Glasgow had passed the qualifying examinations of the Pharmaceutical Society. They were not so very hard, and with perseverance any intelligent assistant could easily pass. He trusted they would soon see a much larger number going up.

Mr. Charles Kerr, Vice-Chairman of the Executive of the North British Branch, in responding, said it was an easy duty, for he knew that Glasgow chemists were now much more in sympathy with the work and aims of the Society than they used to be, and, moreover, they had had so recently brought before them the various points of the Society's work by their able President, Mr. Carteighe. He held that joining a Society like the Pharmaceutical Society should not be regarded as a means of deriving a direct personal benefit, but from the point of view of advancing the general good of pharmacy. There was one recent occurrence which they must all have noticed. He referred to the addition to the *Pharmaceutical Journal* of a supplement containing interesting trade matter. That, he thought, was a great improvement, which should have been adopted long ago. He had found when trying to get members for the Society that a man who would not take a patriotic view of membership would ask, "What do you get for your subscription?" He would mildly suggest "You get the Journal," but to a non-scientific man this inducement was not good enough. The supplement was a decided step in advance, and if still further developed to make the Journal more useful to the busy retail chemist, it would be a valuable means of increasing the membership of the Society. He thought it was a great scandal that so few, out of so large a number of chemists and druggists, were members of the Society. They would never get legislation such as they desired till all the chemists on the Register became members of the Society.

The Chairman then proposed "The Glasgow and West of Scotland Pharmaceutical Association." He said their syllabus for the current session had been a very interesting one, and it was a great satisfaction to see that their own members were taking so much interest and bringing up useful subjects for discussion. They had appointed a Committee to prepare a report on the new Pharmacopoeia for the Faculty of Physicians and Surgeons, and he had no doubt that Committee would give a good account of itself. They had also had several lectures of a high order, but the attendance had not been so good as it might have been. They had been exceedingly unfortunate in the matter of weather. One feature of the session had been the visit of Mr. Carteighe. His speech and its reception were a good augury for the future of the Association. He would like to touch on one or two points. It was clear that until every chemist and druggist joined the Society they could get very little legislation. That was his strongest point, and lay at the very root of the efforts that had been made to resuscitate the Glasgow Pharmaceutical Association, and they would seek to have its efforts crowned with success. If the Society was to obtain extended powers they must support it. It was useless for

those outside to say "What has the Society done?" They were done with the past, and the one question should be "What can the Society do?" It was the future and not the past they had to consider. He would say to all, "Become associated with the Society." Outside they could do nothing; inside they must have a voice in its affairs. If the Council did not represent their views they could turn them out and get their views represented. He believed, if the case were fairly put, the public would recognise their claims and admit that medicines should be got only in chemists' shops. He observed that a new Pharmacy Bill was to be drafted, and he hoped it would meet with the approval of chemists and druggists. If that had been secured in 1868 there would have been no quibbling now about stores, and pharmacy would have been in their own hands. He thought the chemists and druggists at that time made a great mistake, but he hoped those of to-day were more enlightened. There was one thing the Society could do, and that was to confer upon every registered chemist the privilege of membership and the right to sit on the Council. Till that was done he did not think the Society would attain to adequate popularity, but if it was done he believed there would be a great influx of members. He was glad to say their own Association was in a favourable condition, and the membership had been well maintained. He would take this opportunity of saying informally that the Prize Scheme instituted by Mr. Kinninmont was being put in definite shape. Owing to illness he (Mr. Currie) had been unable to attend to the duties laid upon him, but in the course of 1895, or the first or second month of 1896, an examination would be held, and would be open to all Glasgow men who had passed the Minor examination during 1895. He was sorry to say Mr. Kinninmont was not very well. He had felt constrained to resign the position of local secretary, and in accordance with the wishes of his colleagues he, Mr. Currie, had been appointed by the Council to fill the office. During the next month all chemists in Glasgow would be called upon for annual subscriptions, and he hoped every chemist and druggist in Glasgow would pay. He would also remind them of the Benevolent Fund; it was a noble fund, and it behoved them all to support it to the best of their ability.

The toast was then drunk with much enthusiasm. Other toasts were "The Strangers," by Mr. J. Moir, acknowledged by Mr. Cairncross; "The Croupiers," by Mr. A. McKellar, acknowledged by Messrs. J. Foster and A. Laing; and "The Chairman," by Mr. J. McMillan.

The evening's proceedings were enlivened by songs and recitations by Messrs. Bruce, Currie, Laing, Leiper, McKellar, and Steven; ocarina selections by Mr. W. Cunningham; and a ventriloquial performance by Mr. Cairncross.

ROYAL INSTITUTION.—On Tuesday, February 26, Professor Stewart continued his description of the structure and supporting skeleton of corals. Dealing with the *Madreporida* or perforate corals, he described the manner in which the individual polyps are connected by coenosarc, by special ectodermic cells of which carbonate of calcium is deposited. The coenosarc increases in proportion to the growth of the polyps, and the deeper-seated layers retain their vitality; the corallum is therefore in a better position than other allied genera to repair any injury. In *Antipathes* the polyps secrete successive layers of a horny material, and thus build up a cone invested by coenosarc; the skeleton, however, is not of any technical use, as the layers of which it is composed exhibit a tendency to separate. Frequently these horny masses are furnished with thorn-like projections, which are con-

stant in their character and serve to distinguish the various species from one another. In the blue coral, or *Heliopora*, large tubes bounded by small spines contain the polyps, and are surrounded by numerous small tubes with spines projecting from the upper terminations of their walls. These smaller tubes are formed by the coenosarc and do not contain polyps. In certain other corals, such as *Spongodes*, the so-called "dead men's fingers," etc., cells of the ectoderm wander into the mesogloea and secrete spicules of calcium carbonate, as they do in the calcareous sponges. In other species the spicules take the form of minute discs, which are present in immense numbers.

The specimens exhibited and shown under the microscopes included *Heliopora*, *Antipathes*, *Tubipora*, *Sarcophyton*, *Melitodes*, *Spongodes*, etc.

In the succeeding lecture on March 5, Professor Stewart first described the structure of the organ-pipe coral, *Tubipora musica*; in this species a number of parallel tubes bearing the polyps are united by firm transverse plates known as "platforms"; these plates are themselves tubular, and thus all the polyps are in communication with one another. The endo-skeleton consists of a number of tubercular spicules formed by ectoderm cells, which have migrated into the mesogloea, and a number of such spicules fused together constitute the hard coral. In the lower portions of these organ-pipe corals the flesh withers from want of nourishment; the inner living layer shrinks away from the tube and, becoming itself spicular, forms a second smaller tube within the original larger one. In the *Gorgonida*, a group of *Octactinia*, an endo-skeleton is present in the shape of a central axis of supporting material covered by a differently constituted polyp-bearing crust.

Red coral, which the lecturer next described, is so dense and continuous calcareous mass. In this coral the polyps are connected by tubes parallel to the axis; on the inner surface of these tubes the ectoderm probably secretes the calcareous matter which forms the solid coral. The interesting scales which close the aperture of *Caligorgia* and protect the polyp, and the exquisite spicules which form the defensive structures of *Acanthogorgia* were alluded to; the lecture was illustrated by specimens of *Corallium rubrum*, *Eunicea*, *Verrucella*, *Acanthogorgia*, *Plexaurella*, etc.

SCHOOL OF PHARMACY STUDENTS' ASSOCIATION.

A meeting was held on Thursday, February 28, Mr. T. A. Henry, Vice-President, in the chair. A paper was read, entitled "Notes on Bacteriology," by A. Lilly. The author commenced with a description of bacteria generally, their mode of life and reproduction, and some of their most noticeable effects, such as putrefaction and fermentation. Their general prevalence in the lower layers of the atmosphere was noted, but their absence or comparative absence at great elevations was illustrated by the experience of the observatory staff at Ben Nevis, who regularly contract the "Ben Nevis cold" on descending to the lower air, but remain free from catarrhs on the summit, except when visitors from the lower regions pay them a visit and bring the microbes. The action of heat, cold, and various reagents on bacteria was described, attention being directed to the difference between disinfectants and antiseptics. Lastly some of the more important pathogenic varieties were individually described, and specimens were shown of *Bacillus tuberculosis*, *A. anthracis*, *B. acidilactici*, and *Spirillum chelei arlatius*. The note on "Argon" by Mr. A. M. Fear was postponed as Mr. Peter had been laid up by illness and unable to finish it.

Press Comments.

THE HISTORIC WINTERS OF EUROPE.—For the duration and severity of its wintry weather the year now passing stands out as an *annus mirabilis*. Among its predecessors similarly notable was 1402, when the Venetian lagoons were frozen over for many weeks, and 1441, when Lionel d'Este entertained on the frozen Po a numerous company of banqueters. In 1493 not only the Venetian lagoons, but the port of Genoa, were one mass of solid ice—a state of things repeated in 1503, when Marseilles Harbour was also frozen. In 1594-95 the Mediterranean was frozen at Marseilles, and the Adriatic at Venice, and on January 23 and 24, 1685, the Arno at Florence was a racecourse bearing not only the competitors, but innumerable spectators. In 1657-58 nearly all the Italian rivers were flooded with ice, and Rome was well-nigh buried under snow, while in Sweden King Charles X. crossed the Little Belt on foot at the head of 20,000 soldiers, though at the close of the march the ice gave way, and some squadrons of cavalry perished. The Winter of 1705 was terribly severe, as was also that of 1709—the year of the Battle of Poltawa, when for three months all the European rivers were frozen over, as well as those of North America, and at Paris the thermometer sank to 23° below zero. In 1740 there was constructed at St. Petersburg a vast ice palace, in front of which was planted a park of artillery made of ice which, charged with shot, pierced at sixty paces an axis of 54 millimetres. In 1776-77 all the Italian rivers were frozen—a state of things repeated with still more severity in 1788-89, when the deepest lakes were flooded with thick ice, and the temperature from the south to the north of Europe descended from 20° to 40° below zero. Again, in 1794-95, the French cavalry, by a brilliant operation on the frozen Texel, captured the Dutch fleet. Similarly severe was 1798-99, the thermometer registering 17° below zero at Lodz. The winter of Napoleon's retreat from Moscow was an *annus mirabilis* for rigour; that of 1819-20 was remarkable for many successive weeks of unbroken frost, as was also that of 1829-30, so disastrous to agriculture. In the Alta Italia in 1844-45 sentinels on duty were frozen at their posts, while hardly less painfully memorable were 1849-50, 1853-54, and 1867-68. Few can have forgotten the terrible winter of 1870-71, from which all Europe suffered, notably the troops besieging and defending Paris. Long and rigorous was the frost of 1879-80—the thermometer marking at Piacenza 18° below zero. Very heavy and persistent snowfall characterised 1887-88, while between that and the present the most severe winter was undoubtedly that of 1890-91.—*Lancet*.

SELF-POISONING.—Max Nordan, in his interesting work, 'Degeneration,' says that the poisoning of civilised peoples continues to increase. He is referring chiefly to alcohol and tobacco, but there is a widespread and dangerous tendency among the public, especially during an epidemic like the present, to fly to the indiscriminate use of drugs. We are sorry to see in a lay contemporary a summary of treatment, not only hygienic, but therapeutical, culled from various sources. Dover's powder and salicylate of soda are mentioned, and no doubt these are valuable drugs when employed under medical supervision; but we wonder how many people, after reading the article we refer to, will take either or both on their own responsibility, possibly with serious results. Our object is not to deprecate therapeutic medication, but only to warn the average citizen that if he thinks he has influenza he should call in his medical man to prescribe for him, and not dose himself. Dover's powder

is poison, and the responsibility assumed by our contemporary in recommending to its numerous readers the use of the powder indiscriminately is very considerable. Another paper enjoying a well-deserved reputation has published the recipes of three London physicians against influenza. No doubt this was well meant; but it would have been, had the recipes been correctly given, a dangerous inducement to mischievous self-drugging. As the doses, however, are all wrong the advice gratis may prove especially pernicious.—*Lancet*.

It appears as if the efforts of Professor Armstrong and other leading experts in scientific education to improve the methods of teaching chemistry in this country are about to be crowned with success. There can be no doubt that setting beginners in chemistry at test-tubing tends to diminish for good whatever scientific curiosity the pupils may possess. It produces analytical machines instead of reasoning beings. The only possible "advantages" of setting a class of boys at test-tubing are that unfortunately at present it pays best from an examination point of view; and that from the teacher's point of view it is much easier to keep a large class "going" at this than at experiments, each of which would involve probably some personal supervision by the teacher for each pupil. It is, however, probable that increasing interest in their work would nullify this latter argument. In any case the question can only be solved by a re-casting of all the syllabuses in Practical Chemistry examinations throughout the country.—*Technical World*.

THE number of popular biological periodicals which are now issued is remarkable, the more so considering there is no periodical which confines itself to chemistry or physics. For example, *Natural Science, Knowledge, Science, &c.*, are almost exclusively biological, and the most readable articles in *Science Progress* are the biological ones. There is no doubt that the problems of biology come home to the average man much more than a physical problem. Heredity, evolution, and such problems are easily grasped, at least in their main features, and a discussion of them is intelligible even to the "man in the street." This popularity of biology does not, we fear, indicate more students, but more dabblers.—*Technical World*.

THE claim of M. Charles Olzewski, the Polish chemist, for priority over Professor Dewar is, to put it mildly, singularly inopportune, and, in our opinion, a weak one. English scientific men were well aware of the Polish chemist's work (as well as that of Wroblewski), which itself was in every respect simply a continuation and development of Cailletet's work on the liquefaction of the permanent gases. Cailletet's work, again, was simply an application with more perfect apparatus, and in the light of Andrews' researches, or Faraday's great pioneering work. Professor Dewar never, as far as we know, claimed to have first liquefied O, N, or air (nor can M. Olzewski); but he liquefied them in much larger quantities than before, even doing this on a lecture table in front of a large audience. He has investigated in detail the properties, both chemical and physical, of these liquefied gases; he has shown us how to preserve them for an unlimited time by means of a vacuum jacket, and recently has demonstrated how a great many apparently non-phosphorescent bodies become phosphorescent at very low temperatures. Finally, he has experimentally shown that chemical action practically ceases at very low temperatures. He has done this; but because he has

not prefaced all his papers by a description of M. Olaszewski's work, he is hailed as a scientific plagiarist. If he is, then who is not?—*Technical World*.

THE question of the qualifications necessary for becoming a Fellow of the Chemical Society has been fought out more than once. Any restriction of the present elastic conditions must necessarily diminish the number of new Fellows, and so the funds of the Society. This would produce a crippling of the powers of usefulness of the Society. Nevertheless, the public is misled by the use of the letters F.C.S., and too often imagines that the society vouches for the scientific attainments of its Fellows. Unfortunately the persons who use these letters are generally analysts of no great reputation, specialists in advertisement assays, or pseudo-scientific teachers. It is a question which the society ought for its own honour to settle at once. Either insist on a certain minimum amount of training, or else do away, by some means or other, with the attempt to hoodwink the public by using the letters F.C.S. on advertisements or school prospectuses.—*Technical World*.

THE Elihu Thomson electrical energy meter having obtained at the meter competition organised by the City of Paris a first prize of 5000 francs, Professor Elihu Thomson devoted this sum to facilitate the study of certain theoretical questions of great interest, and a committee of French scientists was appointed to examine and report upon the dissertations sent in. The prize has just been awarded to an American scientist, Dr. A. Webster, but on account of another paper being of almost equal merit, Professor Elihu Thomson and others have contributed to offer an equal sum of 5000 francs for the latter paper, the authors of which are Professor Oliver Lodge, F.R.S., of Liverpool, and Mr. R. T. Glazebrook, F.R.S., of Cambridge.—*Technical World*.

Obituary.

On March 4, Sir William Scovell Savory, 66 Brook Street, London, aged 69. Sir William was University scholar at London University, where he took his M.B. degree in 1848, and became a Fellow of the College of Surgeons in 1852. He was created a Baronet in 1890, was appointed Surgeon Extraordinary to the Queen in 1887, and was also Consulting Surgeon to and a Governor of St. Bartholomew's Hospital, and a past President of the Royal College of Surgeons.

Notice has also been received of the death of the following:—

On February 1, E. J. Northey, Chemist and Druggist, late of Truro. (Aged 34.)

On February 22, Donald Watt, Chemist and Druggist, Lybster, N.B. (Aged 50.)

On February 24, John Reece, Pharmaceutical Chemist, Isleworth. (Aged 57.) Mr. Reece had been a member of the Pharmaceutical Society since 1866.

On February 26, D. Gibson Milligan, Chemist and Druggist, Haltwhistle. (Aged 48.)

On March 3, Henry R. Sanford, Chemist and Druggist, London. (Aged 64.)

On March 4, William Dyer, Pharmaceutical Chemist, Halifax. (Aged 74.) Mr. Dyer died at 1, Corn Market, Halifax, from bronchitis following a severe attack of influenza. He had been a member of the Pharmaceutical Society since 1853, and had been in business at Corn Market for forty-five years, during which he was granted the Royal Warrant as "Chemist to Her Majesty."

New Companies Registered.

[Compiled from the *Financial News*.]

MIDLAND APOTHECARIES' COMPANY, LIMITED.—Registered by Waterlow Brothers and Layton, Limited, Birchen Lane, E.C., with a capital of £5000 in £1 shares. Object, to carry into effect an agreement expressed to be made between F. H. Prosser of the first part, W. B. Featherstone of the second part, and this company of the third part; and to carry on business as manufacturing and analytical chemists, surgical instrument manufacturers, etc., in all their respective branches. The first directors—to be not less than two, nor more than five—are F. H. Prosser, W. B. Featherstone (managing directors), and E. J. Smith. Qualification, £100 shares. Remuneration not specified.

AUSTRALIA, LIMITED.—Registered by Davidson and Morris, 40 and 42, Queen Victoria Street, E.C., with a capital of £120,000 in £1 shares. Object, to adopt and carry into effect an agreement made February 22, 1895, between the Proprietary Gold Mines Syndicate, by F. W. Allen (its duly-authorised agent), of the one part and E. Fawcings, on behalf of this company, of the other part, to acquire mines, mining rights, water rights, lands, hereditaments, premises, etc., in Western Australia or elsewhere, and to carry on business as miners and smelters, builders, planters, stock raisers, etc.; to lay out towns and to promote immigration thereto; to construct and maintain rail and tram roads, hydraulic and chemical works, crushing mills, etc.; as company promoters, stock and share dealers, etc. The signatories are:—

	Shares.
F. R. Julian, Broad Street Avenue, E.C.	1
F. E. Bryen, Broad Street Avenue, E.C.	1
H. Schmidt, Broad Street Avenue, E.C.	1
W. H. Holland, Broad Street Avenue, E.C.	1
W. A. Wells, Broad Street Avenue, E.C.	1
E. A. Browne, Broad Street Avenue, E.C.	1
H. W. Stowell, Broad Street Avenue, E.C.	1

The first directors—to be not less than three nor more than seven—are J. Judd, E. E. Lacy, Major G. de Winton, and R. B. Tetley. Qualification, £100. Remuneration, £150 per annum each; chairman, £200.

ELLON'S CRYSTAL BALM COMPANY, LIMITED.—Registered by Lawless and Co., 26, Martin's Lane, Cannon Street, E.C., with a capital of £15,000 in £1 shares. Object, to adopt and carry into effect an agreement, made February 14, 1895, between Mrs. M. J. Ellon of the one part and J. Petrie, on behalf of this company, of the other part, for the acquisition of the business, registered trade marks, rights, secrets of manufacture, and the like, of a certain proprietary article known as Ellon's Crystal Balm: to manufacture and deal in the same; and as chemists, druggists, and dyers generally.

HILLS AND SAUNDERS (LONDON), LIMITED.—Registered by W. Webb and Co., 37 and 39, Essex Street, Strand, with a capital of £5000 in £5 shares. Object, to acquire the business of photographers, etc., as hitherto carried on by Hills and Saunders, at 47, Sloane Street, W., and to develop and extend the same.

Publications Received.

INDIGESTION. An Introduction to Diseases of the Stomach. By GEORGE HERSCHELL, M.D., Lond. Second edition. Pp. 848. London. Baillière, Tindall and Cox. From the Publishers.

THE MEDICAL ANNUAL AND PRACTITIONER'S INDEX, FOR 1895. Pp. 628. Price 7s. 6d. Bristol: John Wright and Co. From the Publishers.

Personal and Trade Notes.

Mr. A. W. Gerrard, Pharmaceutical Chemist, Chertsey, and Examiner to the Pharmaceutical Society, has been appointed analyst to the Chertsey Urban Council.

The *Financial News* remarks "that shareholders in the Sanitas Company have reason to echo, in a way, the phrase invented by Lord Beaconsfield: *Sanitas, sanitas, omnia sanitas!* The concern has turned out a prosperous one for those interested, and for the year 1894 it pays 13½ per cent., which is a most excellent return to the investor. We are not concerned in the contention of the managing director that Sanitas is almost the only non-poisonous disinfectant—that is a matter which rival manufacturers must fight out for themselves—but it is evidently a fruitful invention for money-making; in fact, if it gets rid of scents, it creates dollars instead."

The directors of Bleasdale, Limited, York, in presenting their first balance sheet and report, state that since entering into possession on October 2, 1894, the trade of the company has shown a steady and satisfactory increase. There is a balance of £1,918 19s. 6d., and the directors recommend a dividend of 2s. 6d. per share, being at the rate of 6½ per cent. per annum, free of income tax, for the respective periods the calls have been paid. This will absorb £510, and carry forward a balance of £1408 19s. 6d.

It is stated that the Bayless Drug Co., after twelve months' life in Torquay, was sold up by auction last week. A combination of several of the chemists was agreed upon, and all the drugs were bought in Mr. Holloway's name at a very low price. After the distribution it is proposed to hold a supper to celebrate the event.

Poisoning Cases and Inquests.

Rat Poison.—A man named Afflick, aged 26, died on Wednesday, February 20, from the effects of a rat poison taken in mistake for a sedlits powder. Verdict: "That the poison was accidentally taken, and that death was the result of misadventure."—*Portsmouth Times*.

Laudanum.—Thomas Venn, aged 42, died on Sunday, February 24, at St. Phillips, Bristol, from the effects of laudanum, self-administered. Verdict: "Suicide whilst of unsound mind."—*Western Press*.

Oil of Vitriol.—Ellen Ault, aged 27, died on Sunday, February 17, in the Derbyshire Infirmary, from the effects of oil of vitriol, self-administered. Verdict: "Deceased committed suicide whilst temporarily insane."—*Derbyshire Advertiser*.

Carbolic Acid.—Henry Bowland, aged 49, died on Wednesday, February 27, whilst on the way to the Northern Hospital, Liverpool, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst temporarily insane."—*Liverpool Post*.

Prussic Acid.—Frederick Edward Lilly, aged 44, died on Monday, February 25, at Pimlico, from the effects of prussic acid, self-administered. Verdict: "Suicide during temporary insanity."—*Morning*.

Vitriol.—A man named Arthur Elliot died on Sunday, March 3, at Derby, from the effects of vitriol, taken under the impression that it was something fit to drink.—*Nottingham Daily Express*.

Poisonous Lotion.—At Swansea, on Monday, March D. D. Harris, described as a Jewish science teacher, took some lotion in mistake for medicine, and died most immediately.—*Evening Standard*.

Partnerships Dissolved.

John Standring and Frederick Richard Cooper, Chemists and Druggists and Mineral Water Manufacturers of Manchester, trading as Standring, Son and Co. The business will be carried on by Frederick Richard Cooper.

Thomas Ottey and Richard Bonner Morgan, Chemists and Druggists and Patent Medicine Vendors of Waterloo Street, Burton-on-Trent, trading as Ottey and Morgan. The business will be carried on by Richard Bonner Morgan.

Charles Ekin and Edward Joseph Appleby, Pharmaceutical Chemists of Argyll Street, Bath, trading as Ekin and Appleby. The business will be carried on by Edward Joseph Appleby.

Alexander Cook, M.D., and Percy Charles Evans, M.D., Medical Practitioners of Cardiff, under style of Doctors Cook and Evans.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*.]

Where complete Specification accompanies Application, an asterisk is suffixed.

No. 2986.—Charles Frederick Oakley, 55, Chancery Lane, London.—Improvements in the manufacture of photographic plates and films. February 11, 1895.

No. 3002.—George Devey, 46, Lincoln's Inn Fields, London.—Improvements in electric arc lamps for photographic purposes. February 11, 1895.

No. 3127.—Charles Edward Stanley Parker, 96, Buchanan Street, Glasgow.—Improvements in and relating to portable appliances for heating liquids and the like. February 13, 1895.

No. 3265.—Pierre Prosper Monnet, 55, Chancery Lane, London.—Improvements in vessels for containing volatile liquids.* February 14, 1895.

No. 3356.—George Jones Atkins, 115, Cannon Street, London.—Improvements in the manufacture of mineral and enamel colours for use in the production of ceramic and other photographs. February 15, 1895.

No. 3444.—Gelatine or other similar capsules for enclosing medicaments and other substances. February 18, 1895.

No. 3499.—An improved manufacture of gold foil for use in dentistry.* February 18, 1895.

No. 3527.—An adjustable combined sky-shade and self-capping safety-flap for photographic shutter. February 19, 1895.

No. 3535.—Improvements in apparatus for heating or boiling liquids. February 19, 1895.

No. 3584.—Improvements in lock-up devices or stands for holding bottles. February 19, 1895.

No. 3613.—Improvements in colour photographs and apparatus for producing and viewing the same. February 19, 1895.

No. 3634.—Improvements in photographic cameras.* February 20, 1895.

No. 3652.—Improved hand-guard or protector for bottles. February 20, 1895.

No. 3663.—Adhesive capsule and label. February 20, 1895.

No. 3755.—An improved urethral syringe. February 21, 1895.

No. 3775.—An improvement in bottle caps and seals.* February 21, 1895.

No. 3784.—Improvements in photochromoscopes and photochromoscope cameras. February 21, 1895.

No. 3796.—Improvements in photographic shutters. February 21, 1895.

SPECIFICATIONS PUBLISHED DURING FEBRUARY.

Tannin (Hagemann, O. C.).—The invention consists in the use of amyl alcohol in which the various impurities present in ordinary crude tannin are insoluble, as a solvent. The ground nut-galls, sumach, or crude tannin is digested with amyl alcohol at a temperature which preferably lies between 60° and 70° C., but may be as high as 120° C. The extract is filtered and concentrated in vacuo, or, if the tannin be required of greater purity, it may be separated by agitating the solution with water, the aqueous solution being evaporated in vacuo. By another method, the tannin is precipitated by agitating the amyl alcohol solution with benzene or other liquid, which mixes with amyl alcohol but does not dissolve tannin. The precipitated tannin is treated with benzene to remove all the residual amyl alcohol, and dried. Tannin prepared as above contains some gallic acid, but it may be obtained pure by adding water to the mixed amyl alcohol and benzene solutions. This dissolves out the tannin only. No. 24,278 of 1893.

Lead Salts (Lake, H. H., communicated by Tibbits, J. B.).—The invention comprises means for imparting a permanent colour to carbonate, sulphate, or other salt of lead during its manufacture by electrolytic processes. One method consists in adding to the electrolytic bath, a dye of the required colour, and another consists in employing a supplementary anode of a metal which produces the desired colour. The colour is said to be more regular and more permanent than when a pigment is added after the salt has been prepared. No. 2060 of 1894.

Cocoa (Boisselier, H.).—The cocoa is compressed into the form of tablets or pastilles, containing measured quantities, and preferably having concave sides. The common practice of adding water to assist the extraction of the fat "while in paste after nib-grinding," is modified by using a liquid extract of cocoa. No. 6517 of 1894.

Bottle stoppers (Weber, M., and Lietha, M.).—The stopper or cap of a bottle or jar is hinged to a ring fixed round the neck, and has a plug fitted with a rubber ring around the portion which enters the neck of the bottle, etc. It is secured in the closed position by a hinged catch. No. 8161 of 1894.

Corks (Loach, E. O.).—The invention relates to the metal caps which are often fitted to the tops of corks. A plain metal capsule is secured to the top of the cork, with its flange turned inwards to grasp it firmly, and another ornamental cap is fitted over it, with its flange also turned inwards, and so shaped that the strain upon it in drawing the cork forces the flange of the inner capsule more firmly upon the cork. No. 18,780 of 1894.

Sea-sickness, preventing (Waldron, W. G.).—A draught for preventing sea-sickness is made from ginger, lemon-peel, raisins, sugar, isinglass, quinine, brandy and water in stated proportions. No. 21,958 of 1894.

Trade Marks Applied For.

[Compiled from the *Trade Marks Journal*.]

184,148.—**OA-LAK**.—A medicinal preparation for gout for human use.—Alfred Bishop and Sons, Limited, 17, Specks Fields, 48, Spelman Street, Mile End, New Town, London, E. December 7, 1894.

183,690.—**SPIERPON**.—Perfumery.—Spiers and Pond, 38, New Bridge Street, London, E.C. November 16, 1894.

184,061.—**SISTIS**, and name and address of applicant and other wording on a label.—A hair lotion.—Francis Emile Becker, 33, 35, and 37, Hatton Wall, London, E.C. December 4, 1894. The essential particular is the word 'Sistis.'

184,684.—**SAONETTO**.—Perfumery (including toilet articles, preparations for the teeth and hair, and perfumed soap).—John Dicker, 28, Grays Inn Road, London. January 5, 1895.

186,017.—**DERTHENIA**.—Perfumery (including toilet articles, preparations for the teeth and hair, and perfumed soap).—Henry John Miller, 47, Oswald Street, Glasgow. January 21, 1895.

181,615.—**"ICOVENE"**.—A new one-solution photographic developer. A chemical substance used in photography.—Henry Robert Browne, 1, Cornfield Road, Eastbourne. August 10, 1894. The essential particular is the word 'Icovenne.'

Market Report.

Chemicals and Drugs.

THE CHEMICAL MARKET.

THURSDAY, MARCH 7, 1895.

We are unable to chronicle any marked changes in the Chemical Market during the past week. There have been but few alterations in the quotations, and where changes have occurred no important features have presented themselves. All interest in citric acid seems to have died out, and it remains quiet at last week's rates. Tartaric acid has generally been a dull market, but towards the close a improvement has been manifested, and a rise would not surprise us. Oxalic acid remains steady. There has been no change of importance in sulphate of ammonia, but it has maintained its position, having been in continuous steady demand at last week's rates and a slight advance, but closes at the previous quotations. Carbonate and ammoniac are unchanged. Arsenic and ashes are steady, supplies being still but small; whilst the weak market in borax has not been improved upon. Copper sulphate has been in brisk demand at unchanged rates. Cream of tartar continues in steady demand, top quotations showing improvement on last week's quotations. Mercurials and quicksilver are unchanged. Potash and soda compounds show a weak market at practically unchanged rates.

ACID, BORACIC.—Still quoted at 30s. for crystals, and powdered at 32s.

ACID, CITRIC.—All tendency to improvement has died out, and but little business has been passing. Quoted at last week's rates of 1s. 1½d. to 1s. 2d.

ACID, OXALIC.—Unchanged, but in steady demand. Quotations are still 3½d. net, ex rails.

ACID, TARTARIC.—Last week's quotations still hold, but at the close business has been much improved, and closes very steady, with a tendency to advance. English makes are quoted at 10½d. to 11d. Foreign ditto, but powder and crystals, are returned at 10½d.

AMMONIA SALTS.—Sulphate continues in steady demand, with a tendency earlier in the week to advance. At the close, however, it is quoted at last week's rates. Prices for grey 24 per cent. are returned at £11 7s. 6d. Carbonate: Unchanged. Last week's quotation of 3½d. to 3¾d. still hold. *Sal Ammoniac*: Last week's rates unaltered. First quality is still quoted at 39s., and seconds at 37s.

ASHES.—In steady demand at unaltered rates. Prime still rule at 40s. for *America*, with pots at 23s.

ARSENIC.—Supplies continue small, and firm market. Quotations unchanged at 14s. 9d. to 15s.

BLEACHING POWDER.—In fair demand, with prices well maintained. Quoted at 8s. 3d. to 8s. 6d.

BORAX.—Market continues very dull in tone, and improvement seems probable. Quotations returned at still 19s. 6d. for crystals and 20s. 6d. for powdered.

COPPER SULPHATE.—A steady market, and the quotations are very firmly maintained. The prices still returned at £14 17s. 6d. for ordinary to £15 10s. for special brands.

CREAM OF TARTAR.—The improvement noted last week still continues, and the demand has been fairly steady, with an advance in the last quotations. White crystals are quoted at 63s. 6d. to 64s., with powdered at 65s. 6d. to 66s.

MERCURIALS.—Unchanged. Quantities up to 28½s. still returned at:—*Calomel*: 2s. 9d. *Red precipitate*: 2s. white ditto, 3s. *Corrosive sublimate*: 2s. 5d.

POTASH COMPOUNDS.—The market continues weak round. *Prussiate*: Easy at last week's rates, being at quoted at 9½d. *Chlorate*: Unchanged, at 4½d. *Bisulphate*: Unchanged, at 4½d. to 4½d.

QUICKSILVER.—Firm, but quotations are unchanged. In first hands the prices are still £6 10s., approximately to those quoted by second-hand holders, which at £6 9s. 6d.

SODA COMPOUNDS.—Quiet. *Caustic Soda*, 70 per cent. is still returned at £8, whilst £7 is asked for 60 per cent. Crystals steady at 33s. to 33s. 6d. *Bicarbonate* returned at 27s. (London). *Hyposulphite* is returned at 28s. (Liverpool) in 1 cwt. kegs.

THE DRUG MARKET.

The sales to-day passed off very quietly. *Ipecacuanha* was largely offered, and sold freely at low rates. *Eucalyptus* oil was in good supply, but a great amount of business was not done. Details:—

ACACIA.—A fair amount was offered, but little changed hands. Six bags dark lumpy Australian gum was sold at 28s. of a parcel of twenty-six packages. Fine white Indian gum was bought in at £9, whilst fair pale quality was held at 75s.

ACONITE.—Fifteen bags fair Japanese root were bought in at 25s.

ALOES.—In moderate supply. Thirteen boxes of *Curaçao* sold to-day at 47s. to 55s. for good bright livery qualities, whilst 16 kegs *Socotrine* fetched 60s. A parcel of 29 boxes *Curaçao* was sold at 18s. to 19s. for very ordinary and drossy. *Cape* was in fair demand, 17 cases being sold from 23s. to 28s. 6d., with 17s. paid for the drossy article.

AMBERGEE.—In fair supply, but little sold. Fair brown flake was bought in at 55s. to 70s. About 16 cws. were sold at 29s. to 39s. for common qualities.

AMMONIACUM.—Seventeen cases were bought in.

ANISEED.—Sixty-four bags *Spanish* were bought in at 40s.

ANATTO.—Four bags were bought in at 4½d.

ARECA NUTS.—Seventeen bags, offered without reserve, were all sold at 14s. 6d.

ANTIMONY.—Fifty cases crude *Japanese* were bought in at £17 15s.

ASAFOETIDA.—Six cases good bright broken block were bought in at 65s.

BENZON.—In fair supply to-day, but all bought in.

BUCHU.—Only small quantity offered. Good bright long leaves were bought in at 9d.

CAFFEINE.—Continues in firm demand at 15s.

CALUMBA.—Ten bags fair root sold at 20s. 6d.

CAMPOR.—Crude *China* was all bought in, whilst twenty-six cases of refined *Japanese* in squares was bought in at 1s. 5½d. Two packages crude *German* were offered and bought in at 1s. 4½d., the limit being 1s. 4½d.

CAMPOR (refined).—Remains in steady demand at last week's quotations. *German* and *English* makes in *bells* or *flowers* are still returned at 1s. 5½d. for ten cwt. quantities or 1s. 6d. for smaller quantities, with *squares* at proportionate rates.

CANNABIS INDICA.—In fair supply, but all was bought in at 2½d. to 2½d.

CARDAMOMS.—In good supply and business was fairly brisk, steady prices being realised. *Ceylon*, *Mysore*, good white medium to very bold, 2s. 10d. to 3s. 3d.; medium yellowish bright, 2s. 8d. to 2s. 6d.; small to medium, 2s. to 2s. 2d.; lean brown, 1s. 6d.

CASCABELLA.—Fifteen bales good bright small bark were bought in at 60s.

CASCARA SAGRADA.—Fifty-three bales were bought in at 21s.

CANTHARIDES.—Ten cases bought in, the limit being 1s. to 1s. 1½d.

CASTOREUM.—Two packages offered, but did not elicit a bid.

CINCHONA.—A fair quantity was sold to-day. Of a parcel of 67 bales of brown and grey bark, 65 were sold, 10 without reserve at 1½d., the remainder at 6d. to 1½d., with best at 1s. 6d. No enquiries for red bark, all being bought in, his applies also to *Java* and *East India* bark, which were bought in at 1s. 3d. and 5d. respectively. A fair amount of yellow bark sold at 6d. to 9½d.

COCA.—Eleven bales bright green to brownish leaves were bought in, the limit being 1½d.

COLOCYNTH.—Ten cases were bought at 1s. 10d., the mit, 1s. 8d., not being forthcoming.

COCAINE.—Previous quotations still hold. Firm at 18s.

CODEINE.—Steady at 12s.

COPAIBA.—Was all bought in. *Maranham* at 1s. 7d., *chia* at 1s.

CUSCUS ROOT.—Fifty bales bought in at 15s.

CUBEBS.—Twenty-two bags from Bombay were sold to-day at 86s.

CUTTLEFISH.—Thirty-three casks bought in at 2d.

DRAGON'S BLOOD.—Fourteen cases Singapore were offered and bought in. Good (fine gum was worth about £11. Good red in hard lumps are bought in at £6 10s. to £5 10s.

EGROT.—A fair amount of Spanish was offered to-day, and all bought in at 9d. to 1½d.

EUPHORBUM.—Fourteen serons were bought in, the limit being 15s.

GAMBOGE.—Bought in at £10.

GENTIAN.—Fifteen bales bought in at 16s., the limit being 15s.

GLYCERIN.—Very firm. Manufacturers of the German article, chemically pure, e.g. 1°260, quote at 48s. 6d. to 45s.

HONEY.—Three packages offered without reserve sold at 14s. Jamaica was held at 27s. to 28s.

IPECACUANA.—Largely offered to-day, and fair business resulted, but the prices were vdry easy, and sales show a decline. Good sound annulated Rio root was selling at 5s., with 4s. 8d. to 4s. 8d. paid for fair mixed ditto. Carthagena (Columbian) root was in considerable demand at prices ranging from 8s. 1d. to 8s. 6d.

JALAP.—Fair amount offered, but was all bought in at 1s. 3d. to 1s. 6d. for fair to good Vera Cruz.

KOLA.—Fine bright nuts bought in 1s. 6d. to 1s. 8d.

LIQUORICE ROOT.—Two hundred bags sold at 8s. to 8s. 6d. for common quality.

MENTHOL.—The leading brands are quoted at 15s. spot for good white crystals, whilst forward prices are 14s. to 14s. 6d., *C.i.f.* terms.

MENTHOL.—Two cases of *Cocking's Japan* in good white crystals bought in at 20s., with *Japan* at 16s.

MORPHINE.—Remains steady at unchanged rates, quotations being 4s. 9d. to 5s., according to quantity.

MYRRH.—Two cases sold without reserve at 97s. 6d. for good mature picked, with sorts bought in at 60s. to 70s.

OILS (ESSENTIAL).—*Aniseed*: Remains easy at a slight decline. Quoted at 5s. 8d. to 5s. 9d. *Cassia*: Steady at unchanged rates. It is worth 4s. to 4s. 3d., according to the percentage of cinnamic aldehyde. *Peppermint*: H. G. Hotchkiss' brand is steady at 9s. 10d. to 10s. *Japanese* oil, 40 per cent. remains at last week's rates, being quoted at 8s. 6d., with *dementholised* oil at 6s. 6d. to 7s. *Lemon* oil is rather easy, 4s., *f.o.b.* representing a fair quotation for a standard brand of guaranteed purity. *Eucalyptus* has continued in strong demand, at very firm rates, as indicated in last week's report; and as long as *la grippe* continues, the demand will be maintained. It can, however, safely be said that the phenomenal prices reached two years ago will not be repeated, as the stocks held are very considerable, and the present time affords a favourable opportunity for disposing of them on good terms. The demand has been especially shown for the lower-priced oils. Sales privately by one of the largest importers have realised 1s. for common *Sydney* oil, with *Tasmanian*, containing 50 per cent. to 60 per cent. eucalyptol at 1s. 3d. The quotations of the principal Continental distillers do not show any marked change, but from all accounts a considerable rise in all oils the produce of Grasse and surrounding district is very probable, owing to the severity of the weather. This influence has already affected the quotations of the principal English distillers; in fact, the Mitcham oils have gone up by leaps and bounds during the last few days, and will continue to do so. *English Lavender* oil is now worth 70s. to 72s., with *Mitcham peppermint* at 25s. Oils (essential) *eucalyptus*: largely offered to-day, but not much sold. Eleven cases *Native's bear* brand sold at 1s. 4d. without reserve. *Globulus* oil was taken out at 8s. 6d., and *Amygdalins* oil at 1s. 9d. to 2s. *Cinnamon* oil was bought in at 9d. to 1s. *Bergamot*: Three half coppers sold at 3s. 9d. *Cajuput* was bought in at 2s. *Bay leaf* oil bought in at 9s. to 10s. *Rose* oil settlings sold at 1½d., with the oil bought in at 5½d.

OILS (FIXED) AND SPIRITS.—*Linseed* has fluctuated somewhat, but throughout the week the market has been steadier. It is now quoted at £20 12s. 6d. *Cotton* has been in slow demand at slightly easier rates. Quota-

tions £17 5s. to £18, according to brand. *Coco-nut*: Steady. *Ceylon*, £23. *Cochin*, £25. *Mauritus*, £23. *Rape*: Steady at unchanged rates. Quotations for refined oil are £21 15s. to £22. *Turpentine* continues very firm, with steady advance in price. American spirit is now worth 22s. 6d. to 22s. 9d., again showing an advance of 3d. to 6d. on last week's rates. *Petroleum*: Very firm at advanced quotations. American oil is worth 5½d. to 5½d., with Russian 4½d. to 4½d. *Petroleum spirit*: Ordinary, 7d.; deodorised, 7½d. to 7½d.

OILS (fixed).—*Castor*: Fifty-eight cases No. 1 Calcutta oil were bought in at 2½d. *Cod liver oil*: Twenty-five casks old Norwegian oil, second quality, sold without reserve at 4s. per gallon. The prices for prime old '94 oil is 170s. with finest new season's; non-congealing oil variously quoted, some selling at 190s., another holding at 210s. to 230s. in Norway.

OPIMUM.—A fair amount of business has been done at unchanged rates. Quotations:—*Turkey*: Soft shipping description, 12s. to 12s. 6d.; best "druggists," 10s. to 10s. 6d.; seconds ditto, 9s. to 9s. 6d. *Persian*: 11s. 9d. to 12s.

ORANGE PEEL.—Good bright thin-cut Maltese peel sold at 9½d. to 10d.; other qualities at 8d.

PILOCARPINE.—Quotations for *Hydrochlorate* and *Nitrate* remain very steady at 8s. to 8s. 6d. per gramme. As, however, the raw material is scarce, an advance on these prices is very probable.

QUASSIA.—Ten tons bought in at £5 5s.

QUININE.—Has been fairly steady during the week. Five thousand oss. *Amerbach* were bought in to-day at 1s. after a bid of 11½d. *B. and S.* and *Brunswick* brands remain steady at 11½d. to 11½d.

RHUBARB.—Has been slow of sale to-day. Good bold sheusi root sold at 2s. to 2s. 6d.; other qualities 1s. to 1s. 6d.

WAX (BEES).—16 bags San Domingo wax were all sold at 26 15s. to 27 7s. 6d.; 1 box W. I. wax sold at £3 5s.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between these prices and those of the wholesale drug trade.]

Notices to Contributors.

. Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

To ensure accuracy, all chemical formulae, and scientific and proper names, should be written or printed with extra care; whilst if names of plants and animals are underlined, and generic names alone commenced with capital letters, much inconvenience will be obviated.

Late Advertisement.

JUNIOR ASSISTANT Wanted. About 22. Must be a quick and accurate Dispenser and used to making Pharmaceutical preparations. In-doors. Apply (personally preferred), stating age, height, salary required, with photo, to R. C. HARRISON, Pharmaceutical Chemist, 3, Eltham Rd., Blackheath, S.E.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, MARCH 9.

Pharmaceutical Football Club v. Melrose Rovers at Wormholt Farm, Shepherd's Bush. Commence at 8.15 p.m.

SUNDAY, MARCH 10.

Sunday Lecture Society, at 4 p.m.

"Perpetual Motion" (Illustrated), by Douglas Carnegie.

TUESDAY, MARCH 12.

Royal Institution of Great Britain, at 8 p.m.

"The Internal Framework of Plants and Animals" (Ninth Lecture), by Professor Charles Stewart.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

Royal Colonial Institute, at 8 p.m.

Ordinary Meeting.

Royal Photographic Society, at 8 p.m.

"An unconsidered Property of Photographic Lenses," by T. B. Dallmeyer.

Liverpool Chemists' Association, at 7.15 p.m.

Annual Dinner at the Adelphi Hotel.

WEDNESDAY, MARCH 13.

Pharmaceutical Society of Great Britain.

Library, Museum, School and House Committee.

Evening Meeting at 8 p.m.

University College (London) Chemical and Physical Society, at 5 p.m.

Ordinary Meeting.

Society of Arts, at 8 p.m.

"The Meat Supply of the United Kingdom," by E. Montague Nelson.

Sheffield Pharmaceutical and Chemical Society, at 8.30 p.m.

"Recent Research in the Micro-structure of Steel," by Professor Arnold.

THURSDAY, MARCH 14.

Royal Institution of Great Britain, at 8 p.m.

"Three Periods of Seventeenth Century History," by Samuel Rawson Gardiner.

School of Pharmacy Students' Association, at 7 p.m.

"The New Element, Argon," by A. M. Peter.

"Report on Pharmacy," by W. Moore.

Society of Arts, at 4.30 p.m.

"Art Tuition," by Professor Hubert Herkomer.

Chemists' Assistants' Association, at 8.30 p.m.

"The Pharmacist in Fiction," by A. C. Meyer.

Midland Pharmaceutical Association, at 8.30 p.m.

Social Meeting at the Midland Hotel.

FRIDAY, MARCH 15.

Royal Institution of Great Britain, at 9 p.m.

"The Rarer Metals and their Alloys," by Professor Roberts-Austen.

Quekett Microscopical Club, at 8 p.m.

Ordinary Meeting.

SATURDAY, MARCH 16.

Royal Institution of Great Britain, at 3 p.m.

"Waves and Vibrations" (Third Lecture), by Lord Rayleigh.

Exchange.

OFFERED.

"PHARMACEUTICAL JOURNAL."—Vols. 8 to 24, bound; *Linnean Journal, Zoology*, vols. 14 and 15, bound; *Chemical Journal*, 1893-94, unbound; *Photography*, 2 to 5, unbound.—Burnett, Worcester Street, Oxford.

WANTED.

"THE ANALYST."—Volumes or numbers from 1894 inclusive. State prices, which must be moderate, John care of J. Robinson, 125, South Lambeth Road, S.W.

Notes.

PHARMACEUTICAL FOOTBALL CLUB.—As previously announced, the annual dinner of the Pharmaceutical Football and Cricket Club will be held at the Queen's Hall, Holborn Restaurant, on Wednesday, March 20. Dr. Attfield, the President of the Club, is expected to take the chair at seven o'clock. Tickets five shillings each may be obtained from the honorary secretary, Mr. T. Tickle, 17, Bloomsbury Square, W.C.

BENTLEY'S 'BOTANY.'—A new edition of this well-known classic will be published shortly by Messrs F. and A. Churchill. It is being edited by Professor F. Reynolds Green, and will appear in two volumes. The first volume, which will be devoted to morphology and anatomy, and contain a large number of new illustrations, has been almost entirely re-written by Professor Green.

PHARMACY AT THE CAPE OF GOOD HOPE.—The Medical and Pharmacy Register for the Colony of the Cape of Good Hope, for 1894, contains the Act of 1891, with the rules and regulations based thereon; reports of the Medical Council and Pharmacy Board for 1893; and lists of licensed medical practitioners, dentists, chemists and druggists, certificated midwives, and trained nurses.

A NEW EPIDEMIC.—The Berlin correspondent of the *Standard* states that a new epidemic now prevailing in the German capital, is regarded by Professor Virchow as a human form of the foot and mouth disease, probably caused by drinking the milk of diseased cows, the sale of which ought to be most strictly forbidden. It is almost restricted, as yet, to the south-western parts of the city. Blisters in the mouth are the most characteristic feature of the disease, which generally breaks out very suddenly, several days after infection.

INTERNATIONAL EXHIBITION AT ATLANTA.—An international exhibition under the title of the Cotton States and International Exposition, will be held in Atlanta, State of Georgia, U.S.A., from September 18 to December 31, 1895. It has received the official endorsement of the United States Government, Congress having appropriated 200,000,000 dolrs. for a government building and exhibit. The Exposition has also received the endorsement of the Legislatures and principal commercial bodies of all of the Southern States, which will be represented by State buildings and exhibits. The management has established an office in London—Mansion House Chambers, 22, Victoria Street, E.C., and has appointed Mr. A. Sacchi, who will supply all the necessary information, Commissioner at Large for Europe.

THE HELMHOLTZ LIBRARY.—It is stated that, by decision of the Reichskanzler, the important scientific library of the late Professor Helmholtz has been purchased for the Physikalisch-technische Reichsanstalt of Berlin.

GOVERNMENT ANALYST FOR TRINIDAD.—Dr. Walter Ince, son of Mr. Joseph Ince, who is at present acting as Assistant-Lecturer in Chemistry at St. Thomas's Hospital Medical School, will shortly leave England for Trinidad, having been appointed Assistant Government Analyst for that dependency.

EXHIBITION OF PHOTOGRAPHY.—A special exhibition of photography in its application to the arts, sciences, and industries throughout the British Empire, is to be held during the forthcoming summer season at the Imperial Institute. There will be seven divisions—the history of photography; artistic photography; photography as an industry; photography in its applications to industries; applications of photography to the sciences; education in its connection with photography; miscellaneous applications of photography. Particulars may be obtained from the Secretary to the Photographic Exhibition (1895), Imperial Institute, S.W.

PHARMACOPEIA COMMITTEE IN EDINBURGH.—We learn that Messrs. J. Laidlaw Ewing, Peter Boa, and George Lunan have been appointed as the pharmaceutical members of the Pharmacopoeial Committee of the Royal College of Surgeons, Edinburgh.

PRESIDENCY OF THE BRITISH ASSOCIATION.—It is announced that Sir Joseph Lister will act as President of the British Association at the meeting at Liverpool next year.

DISSOLVED IN SULPHURIC ACID.—A report has appeared in the daily press of a strange accident at Mulhouse, in Alsace. It is stated that a chemical operator was blown by an explosion of nitro-benzol into a trough of sulphuric acid three feet deep, and that his whereabouts were only ascertained through the accidental discovery of two porcelain buttons and an indiarubber mouthpiece in the trough, everything else pertaining to the unlucky man having been dissolved. An electrical journal regrets that no attempt was made to restore the deceased by electro-deposition from the solution in which he was contained.

PHARMACY AND CITY COMPANIES.—At the Court Dinner of the Worshipful Company of Pattenmakers, held on Tuesday last (see p. 95), the large and distinguished company included a number of leading pharmacists, who attended by invitation of the Master (Major Clifford Probyn, J.P., L.C.C.) to meet the Lord Mayor and the Sheriffs. Amongst others present were Mr. Michael Carteighe (President of the Pharmaceutical Society), Mr. W. Gowen Cross (Mayor of Shrewsbury, and Vice-President of the Society), Professor Greenish, Messrs. A. Bottle, E. N. Butt, C. B. Allen, W. Martindale, W. Hills, R. Bremridge, J. Mos, G. S. Taylor, E. White, and W. H. Symons.

PERSONATION CASE AT GREENOCK.—The case of Conner v. Cairns came up on appeal at the Sheriff Court, Greenock, on Monday last, but was adjourned for consideration by the Sheriff.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

CARBOLIC SMOKE BALLS AND MEDICINE STAMPS.—At Marlborough Street Police Court on March 6, the Carbolio Smoke Ball Company (Limited), of Oxford Street, was summoned for selling a box containing a carbolio smoke ball without being stamped. Evidence having been given as to the purchase of a carbolio smoke ball by an Excise Officer, Mr. Arthur Newton, in defence, said in 1890 the company wrote to Somerset House asking whether it was necessary to have a stamp on the article in question, and received a reply stating that it was not.—The magistrate pointed out that the authorities since that time might have altered their opinion upon the subject.—Mr. Alpe, for the Inland Revenue, said in 1894 the company was informed that it was necessary to have the article stamped.—The magistrate said he would be glad to grant a case upon the question.—Mr. Newton did not desire to appeal, but he would like an expression of opinion from the magistrate as to the balls being stamped before they were sold, as the company had a large stock of the articles on hand.—The magistrate said that the company could petition the authorities at Somerset House, pointing out that until the year 1894 it had reason to believe that it was acting within the law.—A fine of 10s. was imposed.—*Standard.*

WHAT IS BEESWAX?—At the Pontefract Petty Sessions, on Monday, February 25, W. R. Maud, J.P., chemist, of the Market Place, was summoned on a charge of selling to the prejudice of Wm. Henry Wilson, Inspector of Weights and Measures, etc., a certain drug, white wax, not of the nature, substance and quality demanded by the purchaser, but containing on analysis thirty parts beeswax and seventy parts paraffin wax, contrary to the Food and Drugs Act.—Mr. Wilson said that on January 10 he visited the defendant's shop and purchased 4 ozs. of white wax and then notified that he intended to have the article analysed. On February 11 he received a report from the public analyst stating that the article was a compound of thirty parts beeswax and seventy parts paraffin wax.—Mr. Maud accepted the analysis, but put the witness through a long cross-examination. This elicited that the officer had purchased many other articles from the shop of Mr. Maud, and had them analysed, but he declined to say what the report on them was. He had nothing to say about them. He granted that there was nothing but wax in the substance produced, but it was not white wax according to the British Pharmacopoeia. He paid for it at the rate of 2s. 8d. a pound, and the price of the best white wax was 4s. There ought to have been a label attached to show that it was not pure beeswax.—Mr. Maud, in defence, objected to the summons, and argued that the article was not a drug within the meaning of the Act for either of these purposes. There were several articles entered in the same position as this in the British Pharmacopoeia, such as vinegar, mustard, flour, pearl barley, soap, sugar, tobacco, and treacle, but these were not made for medicinal purposes, and were not drugs. British Pharmacopoeia white wax was defined as "yellow wax bleached by exposure to moisture, air, and light." It was not white, but rather yellowish, and would not serve the purposes required in the laundry as the wax which the inspector bought, which was white, did. He claimed that

what was asked for by the inspector was given him, but had he asked for pure beeswax, bleached, he would have got the other kind. He produced samples of each kind in court, and protested strongly that such attacks be brought against tradesmen to the risk of their credit.—The case was dismissed, as was one also against Mr. W. Bratley, chemist, exactly on all fours with it.—*Pontefract Express.*

LIVERPOOL CHEMISTS' ASSOCIATION.—The annual dinner of the forty-sixth session of this Association was held at the Adelphi Hotel on the evening of Tuesday, March 12, when Mr. John Smith, President, occupied the chair, about one hundred members and friends attending. The Chairman was supported by Messrs. A. C. Abraham, F.I.C., F.C.S., and M. Carr, F.C.S., Vice-President; Dr. Symes, Messrs. T. I. Abraham, R. C. Cowley, H. O. Dutton, J. Hoch, J. T. Hornblower, J. Woodcock, J. J. Smith, W. Wellings, A. S. Buck and T. H. Wardleworth (Hon. Secs.), W. R. Smith, H. Peet, C. J. S. Thompson. The President read letters from the Right Hon. the Lord Mayor and Professor Harvey Gibson. The guests included Professor Carter, M.D., B.Sc., F.R.C.P., Lond., Professor Hele-Shaw, M.I.C.E. (President of the Engineering Society), Drs. Nevins, Barnes, Brannigan, Hawkins, Ambler, O'Flaherty, Sharp, Logan, and Mr. L. Thom. The menu was as follows:—

Oxtail.	Soups.	Consommé Royale
	—	
Salmon.	FISH.	Hollandaise Sauce.
	Cucumber Salad.	
	Whitebait.	
	—	
	Petites Bouchies	Montglas.
	RELIEVES.	
Sirloin of Beef.	Saddle of Mutton and Jelly.	Yorkshire Pudding
	Vegetables.	
	—	
	Roast Turkey and Sausage.	
	Salad.	
	—	
Bombe Midland.	ENTREMETS.	Pastry.
	Fruits.	
	—	
	DESSERT.	

After the loyal toast had been well received, "The Medical Profession" was proposed by Dr. Symes, Professor Carter and Dr. J. R. Logan replying; "The Pharmaceutical Society," proposed by Mr. A. C. Abraham, Mr. A. S. Buck (assistant local secretary) replying; "The Liverpool Chemists' Association," proposed by Dr. J. B. Nevins, replied to by Mr. Carr, "The Learned Societies," proposed by the President and replied to by Professor Hele-Shaw. The toast of the evening, "Our Guests," was proposed by Mr. Wardleworth. Our musical friends, Messrs. Kirkham, Edwards, Heginbotham, Platt, and J. Owens (humorist), with Mr. Liddell as accompanist contributed a very excellent programme, placing the dinner of 1895 among the most enjoyable gatherings held by this Association.

INDIANA PHARMACISTS MAKE ANOTHER ATTEMPT.—Indiana pharmacists are making another attempt to secure a pharmacy law, and we hope they will succeed in getting just the kind of a measure they wish. A Bill has recently been introduced into the legislature of that state providing that any person who desires to engage in the drug business (the compounding of prescriptions) must secure a licence. Graduates of reputable pharmaceutical schools are to be entitled to practise, but without such diplomas all candidates must undergo an examination at the hands of a commission. The proposition that a diploma from

college shall be accepted is one that we do not think wise, for the college diploma is by no means evidence that its holder is possessed of all the qualifications necessary to make him a safe compounder and dispenser. And then the matter of discrimination between colleges would keep the licensing board in hot water all the time. A college diploma signifies merely that the student has satisfactorily completed the course of studies presented by that institution. If the college graduate fears to undergo, or cannot pass, the examination of a board of pharmacy, it is about time his alma mater should make decided improvement in the pabulum it supplies its students. The matter of registration seems a simple one enough. No law can be made retroactive, hence those in business at the time of the passage of the act must be allowed to continue, but all others desiring registration thereafter should be required by examination to show their fitness. What we need more than any registration upon diplomas is some way of establishing uniformity of requirement by the boards of the entire country, so that a man who is a registered druggist in one state may be allowed to enter business in another without re-examination. Once a druggist always a druggist, and the Maine druggist should be considered competent in California.—*Pharmaceutical Era*.

DEFICIENT PRELIMINARY EDUCATION OF PHARMACISTS.—The secretary of the Minnesota Board of Pharmacy in his annual report to the governor emphasizes the necessity for better Preliminary education on the part of applicants for examination. Too many boys are taken into drug stores with scarcely any education whatever, and the result is that they seldom acquire it afterwards. They then go before the board four or five years later, unable to write a legible hand, spell correctly, or write a grammatical sentence, and with little, if any, knowledge of mathematics or Latin. This is all wrong, as it is certain to bring chagrin and disappointment to such persons in the future, whether they are successful in passing the board or not, as board examinations are not primarily intended to cover these branches. The secretary believes it would be a wise provision of law which required some standard of general education before the apprentice was permitted to begin his work in the drug store or laboratory.—*Pharmaceutical Era*.

CLAIMS "ANTITOXINE" AS HIS TRADEMARK.—Dr. George E. Dixon, President of the British Antitoxine Manufacturing Co., announces that his company is about to bring suits against some of the large manufacturers of the antitoxin cure for diphtheria, simply to prevent its being made under that name. Dr. Dixon claims he secured the name as his trademark in Washington in October, 1892, for a drug which he discovered years ago, and has used since in cases of fever and neuralgia. He says he has no desire to interfere with the sale of the new cure for diphtheria, but suggests that its makers call it "Diphtheria Antitoxic Serum," thus avoiding confusion. A Broadway patent lawyer has charge of the suits.—*Pharmaceutical Era*.

THE USE OF TINCTURE OF LOBELIA.—Mr. E. Docker, the coroner for North Worcestershire, held an inquest at the Trafalgar Hotel, Moseley, on March 7, touching the death of William Sutton Hackett (60), traveller, residing at Chestnut Villa, Chestnut Road, Moseley. The evidence of the widow and daughter showed that the deceased had suffered from bronchitis and asthma, as well as from a weak heart. On Monday he came down to dinner, but later in the afternoon, when in bed, he seemed so unwell that a doctor was sent for.

The patient was conscious, but seemed unable to speak. He remained in this condition for an hour or an hour and a half, and on the arrival of Dr. Hall Edwardes he was dead. He had been taking cough medicine and tincture of lobelia, the latter having been recommended for the relief of asthma, but the widow assured the jury that the deceased had not taken a tablespoonful all the winter. She gave him half an eggspoonful of the tincture in a wineglassful of water about two o'clock that afternoon. Her daughter had purchased it on Saturday, and only three doses had been used. In answer to the coroner she said she had no idea what the proper dose was.—Miss Alice Emma Hackett said that she purchased the lobelia with the cough mixture at the Moseley Drug Stores, telling the salesman it was to relieve the breathing of her father.—John Newton, of the Moseley Drug Stores, Moseley Road, stated that the last witness purchased the lobelia, and said what it was wanted for.—The Coroner: This is rather a strong mixture, is it not?—Witness: No, I think not, sir. Continuing, in answer to the coroner, Mr. Newton said leading therapeutists considered lobelia a very safe drug; safe enough to give to babies, and it was not usually taken in water. It was not usual to state the dose in such tinctures; it was not poisonous, except in extreme doses. He quoted from an authority of the name of Ringer in support of his contention, and said it would not be policy on the part of a medical man to tell his patients the name of the article used.—The Coroner: Then you assume that because you give the name of a draught or mixture the patients must judge the quantity they must take?—Witness: I do not say so, it is not a dangerous drug; it is a drug we sell every day regularly, and it is not necessary. There is a Poison Act for chemists to follow, and it is not in the Poison Act. I am not supposed to caution people who buy it.—The Coroner said he was of the opinion that it would have been wiser and better if the witness had cautioned the purchaser, and it was hardly the thing to sell a drug of that nature without putting the dose on the bottle.—The Witness: Well, it is a matter of opinion, it is not the law.—The witness was then examined by Dr. Hall Edwardes, with the result that they disagreed as to the properties of the drug, the doctor holding that it was made with ether, and the chemist, spirits of ether. They also disagreed as to its poisonous qualities, and the witness said that if he retailed any of his drugs for special uses he should be breaking the law, and bring the Apothecaries' Society down upon him—he was a vendor and not a prescriber.—Dr. Hall Edwardes said that two drachms had been taken from the bottle. The usual dose was thirty drops, and it should, certainly, be taken in water. He was of opinion that death was due to syncope, and was strongly of the belief that lobelia should have been avoided, as it had a depressing effect. He did not consider a post-mortem was necessary. The jury returned a verdict in accordance with the medical testimony.—*Birmingham Mail*.

THE FOOD AND DRUGS ACT IN YORKSHIRE.—Two reports have been prepared by Mr. Alfred H. Allen, the public analyst for the West Riding of Yorkshire, for presentation to the County Council of that division, which deserve wide publicity, for in them are contained statements of fact so important and expressions of opinion so grave that all who are concerned in the working of the Food and Drugs Act should know of them. The reports are scarcely of less importance to the public generally, for they make it known how the law may be evaded to a certain extent to the detriment of the public, without those who break it being held responsible to the law. The

reports are Mr. Allen's statement for the last quarter of 1894, and his statement for the whole of that year, and the parts of them which deal specifically with the compounding and possibilities of adulteration of certain drugs and condiments are given below. Mr. Allen also points out some of the difficulties which a public analyst meets with in the discharge of that part of his duties which brings him into contact with the powers that be. In one instance in which a case was taken before a Bench of magistrates, affecting the genuineness of seidlitz powders, the chairman expressed the opinion that the inspector might have been better employed than in going about buying seidlitz powders; and in another case, with reference to butter adulteration, a magistrate made the remark from the bench that he should do everything in his power to prevent the enforcement of "such an iniquitous law as the Sale of Food and Drugs Act."

In the course of his report Mr. Allen says: "A large number of drugs and remedies of various kinds have been submitted to me. Some of these were of such a character as to make it impossible to give definite certificates on them. In the first place galenical preparations purchased under the name of articles described in the British Pharmacopœia are usually wanting in such definiteness of character as is necessary to enable a public analyst to certify to their adulteration. As an instance, Friar's Balsam is a useful domestic preparation, which is represented in the British Pharmacopœia by the compound tincture of benzoin, but I know of no authority which would compel the vendor of an article sold under the name of Friar's Balsam to comply with the requirements of the British Pharmacopœia as to the composition and quality of compound tincture of benzoin. To further complicate the question, the British Pharmacopœia simply prescribes the method of preparing compound tincture of benzoin, but gives no test or character by which its general nature can be recognised." On the same subject in his quarterly report, Mr. Allen says: "There is no official recognition of the title of Friar's Balsam, and in the present condition of the law it would be impossible to obtain a conviction for the sale under that name of an article which was not strictly of the nature, substance and quality of the official preparation. This is a type of numerous other preparations, with which, under present conditions, it is impossible to deal satisfactorily."

"As a further illustration of the difficulties under which public analysts work, I may say that the British Pharmacopœia, while defining the ingredients of tincture of rhubarb and the strength of spirit to be used in its preparation, gives no test by which a preparation properly made can be recognised. Further, in applying to the official referees under the Sale of Food and Drugs Act, they professed their utter inability to give me the least assistance in laying down standards or limits of composition for tincture of rhubarb or any information respecting the practice in the Somerset House Laboratory. In order to adequately examine the samples of tincture of rhubarb submitted to me, it has been necessary for me to prepare and purchase a number of such preparations, and to devise a method for their examination and analysis with a view of comparing authentic tinctures with those submitted to me by the inspectors. I have thus acquired considerable information on the subject, but am of course liable to have my certificates contradicted at any moment by appeal to the chemists at Somerset House, who may base their opinion upon wholly different data."

In the particulars of his analysis of tincture of rhubarb in the last quarter of 1894, Mr. Allen says: "Of various samples of drugs examined, tincture of rhubarb presents the most notable cases of

adulteration or deficiency. Not only is a preparation sold which is destitute of saffron—required by the British Pharmacopœia to be used in the preparation of tincture of rhubarb in the proportion of one-quarter ounce to the pint—but the alcoholic strength is frequently deficient, which implies deficiency in the active constituents of the drug. This may be due to the extraction of the drug with too weak a spirit or actual dilution of the finished tincture by the addition of water." In a tabulated statement Mr. Allen shows that he has analysed eleven samples of rhubarb and that only five of these were genuine, the other six samples falling in various ways under the description which applies to them above. In the worst sample his remarks were as follows: "Extractive matter very deficient in alcoholic strength; destitute of saffron." One prosecution had been instituted against a vendor of tincture of rhubarb deficient in extractive matter and in alcoholic strength. The offender was ordered to pay costs.

Dealing with the subject of ground ginger and its adulterants, Mr. Allen says: "The practice of mixing with ground ginger a certain percentage of ginger root which has already been exhausted of its active principles by the manufacturers of ginger has appears from the number of cases in which such adulteration has been detected to be widely prevalent. In one instance a sample of ginger submitted to me was found to contain 10 per cent. of hydrated sulphate of lime. This had been added in the form of fibrous gypsum, the characteristic structure of which was distinctly recognisable under the microscope. In my opinion this addition must have been intentional. I recently collated the results of analysis of 104 specimens of ground ginger, 70 of which were analysed in my own laboratory, and, as a result of those analyses, I obtained an unprecedented amount of information respecting the composition of ginger. This enabled me to condemn a sample which contained 5 per cent. of sand and extraneous matter, but my certificate being disputed, the sample was sent to Somerset House. The referees confirmed the presence of sand, but said that the preparation found was not in excess of that which was sometimes met with in ginger root ground as imported, and as previously washed. As a matter of fact, the results of my analysis showed that the sample in question had been washed, but the referees do not appear to have studied this point; and, as a result, the case was dismissed. As a consequence of the position taken by the referees it will be possible in future to sell 5 per cent. of warehouse sweepings or other rubbish as all ground ginger."

Turning to seidlitz powders, Mr. Allen continues: "Of ten samples of seidlitz powders examined, five exhibited very material departures from the composition of the seidlitz powders prescribed in the British Pharmacopœia, and usually this departure was in the direction of the diminishing of the amount of the ingredients in each powder, thus reducing their activity. In my opinion it is of high importance that a drug sold under a definite name should be, as far as practicable, of constant quality and composition. This is not always attainable in the case of natural drugs, but there is no excuse in the case of preparations compounded of definite chemicals as are seidlitz powders."

ORGANISATION OF MEDICAL ASSISTANTS.—A meeting for the purpose of creating an association of qualified medical assistants, junior medical officers and locum tenens was held on March 11 in the Exhibition Hall, Victoria Embankment, Dr. J. C. Glover presiding.—Dr. T. Howard Brookiehurst, having read letters from numerous medical assistants in various parts of the country heartily sympathising with the objects of the gathering, the Chairman pointed out

the desirability of such an association as was contemplated, bearing in view the many disadvantages with which the ordinary medical assistant had to contend. He pointed out what had already been done by the Medical Council for assistants, whom he estimated to number something like 4000.—Dr. C. Legge thought that one great advantage of the association would be the formation of a bureau for securing appointments and enabling principals to obtain the services of efficient and thoroughly qualified assistants, while it would also help to secure for the latter an improved professional status.—A committee for the purpose of receiving communications on the subject and of taking steps to organise the association was then appointed, the names of the gentlemen being: Mr. John W. Oliver (Hackney Infirmary), Dr. Probyn (Shoreditch), Dr. Orme (St. Pancras), and Dr. Quarry (Lambeth).—*Daily News*.

THE PHYSICS AND CHEMISTRY OF DEVELOPMENT.—On Monday, the 11th inst., the first of two lectures on "The Physics and Chemistry of Development," arranged by the Affiliation of Photographic Societies with the Royal Photographic Society, was given by Mr. T. Bolas, F.I.C., F.C.S., at the Cordwainers' Hall 7, Cannon Street, E.C. Sir H. Trueman Wood presided, and the numerous audience included many well known in photographic circles. The lecture was illustrated by numerous experiments, with the object of showing the analogy between the action of a rapidly alternating current of electricity, and the action of light upon the haloid salts of silver; the light actually producing in the molecules of the silver salt an alternating discharge, and bringing about a condition of electrical tension, the electrical action being continued by the developer until decomposition results. Electrical views of the action of light were first given expression to by Dr. J. Schnauss in 1853, but were merely verbal suggestions. In 1867 the head of the photographic department of the Russian army expressed the more definite view that an electrical current was generated in the molecules which tended towards separation, but stopped short of actual decomposition. Later experiments by Dr. Lodge in England, and by Hertz in Germany, have proved the analogy between electrical radiation and light. In the practical portion of his lecture, which included the electrolysis of water and other solutions, the lecturer was assisted by Mr. Child Bayley, and images of the various phenomena were projected upon a screen by means of an optical lantern, worked by Mr. R. Beard.

THE PATTENMAKERS' COMPANY.—On Tuesday evening last, the Master (Major Clifford Probyn, J.P., L.C.O.) and Wardens of the Pattenmakers' Company entertained the Lord Mayor and Sheriffs at dinner in the Pillar Room, Cannon Street Hotel. Among the guests were Lord Frederick Fitzroy, Viscount Dungarvan, the Earl of Euston, Lord Skelmersdale, Hon. F. Greville, Mr. Sheriff Hand, Alderman and Sheriff Samuel, Alderman and Sheriff Dimdale, Major-General J. C. Hay, Sir John B. Monckton, Admiral H. D. Grant, Colonel W. Gascoigne, Mr. E. F. S. Hopwood (Secretary to the Board of Trade), Sir F. Seager Hunt, M.P., Mr. W. H. M. Christie (Astronomer Royal), Mr. T. G. Fardell, M.P., Mr. F. A. Philbrick, Q.C., Mr. W. Gowen Cross (Mayor of Shrewsbury), Mr. M. Carteige (President of the Pharmaceutical Society), Colonel R. W. Edis, Mr. F. C. Penrose, Sir A. J. Altman (Master of the Joiners' Company), Mr. F. W. Isaacson, M.P., Dr. Armstrong (President of the Chemical Society), Mr. T. F. Blackwell (Master of the Salters' Company), Mr. H. S. Foster, F.P., Mr. W. Emden, Mr. Brudenell Carter, Mr. H. Clarke, Mr. Barrow Emanuel, Mr. H. L. Buck, Rev.

J. Ker Gray, Mr. J. Welford Warden, Mr. A. J. Baker, Major A. J. Thornhill, Mr. R. Clout, Mr. H. H. Bartlett, Mr. J. A. Brand (Controller), Mr. W. M. Bywater, Mr. Peter Looker, and Mr. C. Fitch (Clerk to the Company). The dinner was served in magnificent style, the menu being as follows:—

"Will't please you to fall to."—*Richard II.*, V. 2.

WINE LIST.	HORS D'ŒUVRES.
—	Sardines. Anchovies. Olives.
Punch.	Smoked Salmon. Caviare.
—	POTAGES.
Rudesheim.	Tortue Claire. Tortue Liée.
Berg Riesling.	—
—	POISSONS.
CHAMPAGNES.	Filets de Sole Normande.
Doutz and Geldermann.	Turbot Sauce Hollandaise.
—	Blanchailles Naturel et Diable.
Gold Lack,	ENTREES.
Vint, 1884.	Ris de Veau à la Royale.
—	Foulet Sauté Chasseur.
Koch Fils,	REMOVE.
Vint, 1884.	Jambon de York Sauce Madère.
—	RELEVÉ.
Irroy's Carte	Quartier d'Agneau.
D'Or,	Choux de Mer. Pommes Rissolées.
Vint, 1884.	—
DESSERT	RÔTI.
WINES.	Canetons d'Aylesbury.
—	Petits Pôis. Pommes Frites.
Château	Asperges on Branches.
Larose.	ENTREMETS.
Cockburn's Old	Croute à l'Ananas. Savarin à la Chantilly.
Crusted Port.	Gelée au Maraschin.
—	Pouding Glacé.
	Laitance de Hareng sur Canapé.
	DESSERT.
	Café Noir.
	Fine champagne, 1848. Liqueurs Variés.

"I pray you, jest, Sir, as you sit at dinner."—*T. of Shrew*, IV. 8.

Dinner having been concluded and the usual loyal toasts honoured, the Chairman proposed the "Navy, Army, and Reserve Forces," paying a tribute to the present Government for their efforts to maintain the supremacy of the British Navy. Admiral Grant, Major-General Hay, and Colonel Edis responded. The Chairman then proposed "The Lord Mayor and Corporation," and in doing so expressed a hope that if Parliament in its wisdom should amalgamate the Corporation with the government of the greater London the record of the future Corporation might equal the record of the past.—In reply, the Lord Mayor expressed approval of unification, but not of amalgamation. The latter word was not in his vocabulary. The quack doctors who prescribed for the Corporation had just received a prescription of three years' rest, and at the end of that time he hoped the prescription would be continued for a further period. Mr. H. H. Bartlett, past Master, next proposed "The Sheriffs," to which Mr. Sheriff Samuel responded. In proposing "The Pattenmakers' Company and the Master," the Lord Mayor congratulated the Company on having so excellent a master. The toast was drunk with musical honours, and suitably acknowledged by Major Probyn. The other toasts included "The Past Masters and Wardens," "The Visitors," and "The Clerk." During the evening, under the direction of Wilhelm Gans, an excellent programme of music was given by Mlle. Erna Gelber, Miss Florence Oliver, Mr. Alfred Kenningham, and Mr. Robert de Lacy.

S. M. BURROUGHS' MEMORIAL.—It is gratifying to note that a large number of those connected with pharmacy, in the widest sense of the word, have contributed to do honour to the memory of one who was himself a pharmacist, and have handsomely

subscribed to the fund, which now amounts to over £600. Taking this fact into consideration, the Executive Committee are of opinion that the Memorial should not take the form of a local charity, or a charity of a general character, but that it should be connected with pharmacy, especially as in the neighbourhood of Dartford ample provision will be made to ensure the remembrance of Mr. Burroughs' good deeds, a collection being made in that district for the purpose of subsidising the Dartford Cottage Hospital, in which the deceased took such great and active interest. The Executive Committee is, therefore, of opinion that the memorial should be connected with pharmacy, and that the memorial should take the form of a Burroughs' Scholarship connected with pharmacy, or that a Burroughs' Benevolent Fund connected with pharmacy should be founded, the administration of which should be offered to the Council of the Pharmaceutical Society of Great Britain. This being the case, it is hoped that chemists will freely respond to the appeal and send in their subscriptions, as by doing so they are at the same time helping to advance the interests of their own profession. Information will be given by H. Halbing, Hon. Sec., 63, Queen Victoria Street, London, E.C., and subscriptions should be sent to John Moss, 39, Tressillian Road, St. John's, London, S.E.

SHEFFIELD MICROSCOPICAL SOCIETY.—A general meeting of this Society was held on Friday last at the Rutland Institute, Fargate. There was a good attendance of members and friends, Dr. Hall, B.A., occupied the chair. Mr. J. Newton Coombe gave a lecture on "Modern Microscopy," illustrating it throughout with specially prepared lantern slides. The principles of optics, such as the propagation of light, its velocity, the principle of Huygens, shadow theory, reflection and refraction, were explained in a most interesting style by the lecturer. The various lenses were next considered, and a short history was given of their past and present development and the manner in which they are manufactured and put together. The human eye and its wondrous mechanism—the favourite loitering ground of all microscopists—was faultlessly set forth in Mr. Coombe's most becoming style. The artificial optical instruments—foremost the microscope—occupied the remainder of the evening. All the best makers of modern microscopes and their accessories were noticed and commented upon. The best methods of illuminating, measuring, and camera lucida drawing were also experimentally demonstrated. A hearty vote of thanks was accorded the lecturer on the motion of Mr. Hoole, seconded by Mr. Austen. Afterwards Dr. Hale showed the "Artificial Spectrum Top" made by Newton and Co., which was the means of puzzling not a few of the members.

PHARMACEUTICAL FOOTBALL CLUB.—A match was played on Saturday, March 9, between the Pharmaceuticals and Melrose Rovers on the ground of the former, which ended in an easy win for the home team by three goals to one. Next Saturday's match with the Breweries will be the last of the season for the Pharmaceuticals, so those interested in the club should not miss seeing it. The last match between these teams resulted in a draw—one goal each.

Press Comments.

SALT MINES OF THE PUNJAB.—The range of the salt hills of the Punjab extends from the town of Thelum eastward to Kalabagh on the Indus. There is a salt range extending beyond Kalabagh, across the

Indus, but the salt is of a different age and position. Khewra is the name of the village where the most important of the mines are worked. These are called the Mayo salt mines, in honour of Lord Mayo, who visited them when Viceroy of India. The only inhabitants of Khewra are those whom the work connected with the mines renders necessary; but a railway main communication with Thelum and Lahore easy. A recent report from India, states that the depot where the salt is collected and despatched is called the Warthgarj depôt. The Mayo salt mines are not mine in the sense of being far beneath the surface of the ground—like a coal mine, for instance. At the base of a high, ragged hill there are two or three openings, like the mouths of tunnels, and through these tunnels the visitor may walk or be carried on trolleys, accompanied and guided by miners with torches and kadi earthen saucer lamps, called *dharas*, to light up the encircling darkness. When the visitor overcomes the first sensations of novelty and bewilderment, he looks round and sees nothing but salt, salt roof, salt floor, salt walls, all blackened and begrimed with the soot from torches and *dharas*. Sometimes, at short intervals, large recesses, called "stations," where salt ready for removal is collected, are met with. The salt is rock salt, and is obtained first by blasting and then by cutting with a rough pick. The miners are accustomed to the work that the little *dharas* are all the light they require, and the neatness and regularity with which the walls of the chambers are cut are remarkable. These chambers are immense rooms, one of them being 320 feet long and 150 feet high. The salt obtained is generally of a pink colour, sometimes of a dirty or muddy pink. Natural salt is not to be found in almost every colour—red, brown, green, blue, etc.—but at Khewra the prevailing colour is pink; the transparent crystal salt is also found. A solid, rectangular block of 37 cubic feet, and weighing two tons, was sent to the Vienna Exhibition of 1874. The quantity of salt in the Khewra range is said to be practically inexhaustible. It has been calculated that if an average thickness of only 135 feet and a width of three miles be assigned to the salt beds, then in the 130 miles along which these are seen, there may be 130 miles by 3 miles by 135 feet of beds, giving as the solid content of the salt deposits nearly 10 million miles. As for the quality, it has been stated that the salt is of a purity such as few salt mines of the east can yield.—*Journ. Soc. Arts.*

POISONING BY CARBOLIC ACID.—Statistics bearing upon deaths by poisoning are a subject of annual comment in Great Britain, where the Registrar-General is charged with the duty of carefully collecting and tabulating such matters for England and Wales. The figures recently presented bearing upon deaths from poison during 1893 are quite significant, and in the absence of similar records in this country may be studied with profit, as similar conditions undoubtedly exist in this country. The figures for accidental poisoning show an increase which may possibly be explained through increase in population, and perhaps through some detail in collection of statistics, but the figures upon suicide indicate that the portion of the population which thinks life not worth living is increasing faster than conditions of natural increase warrant. For 1893 the cases in the latter class number 368, an increase of 67 over 1892, 41 over 1891, and 1 over 1890, and what gives the figures for 1893 particular interest is the fact that 117 persons out of the 368 took their lives by means of carbolio acid. The highest number (63) chose opium and its preparations; 40 took oxalic acid; 19 took strychnine; 16 took prussic acid, while for the rest of the poisonous drugs mentioned in the returns a single figure suffices.

indicate their destructive action. The occurrence of so many cases of poisoning from carbolic acid is explained by the fact that it is not upon the schedule of poisons, and is therefore not subject to the legal restrictions which surround other poisonous drugs and chemicals, and confine their sale to qualified chemists. As before stated, statistics of this sort are not available in the United States, but an impression gained through reading the daily papers would lead us to believe that carbolic acid is gaining in popularity as the suicide's friend in this country. And this, too, in spite of the fact that twenty-one States specifically mention it in the poison schedules of their pharmacy laws; several other States have special poison laws, and others cover the subject in a general way by placing restrictions upon the sale of all drugs and chemicals destructive to human life in certain quantities. There must be other reasons for the increasing employment of this drug, and while legislation may render it more difficult to obtain, and perhaps contribute to the apothecary's peace of mind, some other means must be found to head off the suicides. Carbolic acid is largely used as a disinfectant and for domestic purposes, and it is a question whether the extraordinary safeguards put around its sale, and the poison label, with its grinning skull, is not a constant reminder to the dependant that nearly every household has within easy reach an agent for destruction. Added to this is the publication in the daily press of the details of such poisonings, so that the public is pretty well informed as to the toxic qualities of the acid. However, these considerations should not interfere with the legal requirement of certain precautions, and the pharmaceutical press of Great Britain is right in demanding its inclusion upon the poison schedule.—*Pharmaceutical Era*.

MEDICAL science is sadly hampered by the crude theories of the masses. Far as it lags behind other departments of science it dare not move forward as fast as it could or would if the public would let it. No doctor dare do for his patients the best he might because he knows it would mean instant dismissal from the case. A premium is set upon quackery by even well-educated men and women. The most successful doctors are those who take more pains to treat the friends of the sick than they do to cure their patients. To please the well is the secret of success in medical practice. If it was possible to determine the proportion of successes to failures in the treatment of the sick by each medical man, the world would open its eyes in astonishment. It would be found that those whose patients most frequently recover are by no means the ones with the largest practice or who can command the largest fees. He is the most successful one whose personal appearance is pleasing, who has the greatest ability in appearing to agree with influential friends concerning the nature of the disease and the line of treatment. He must espouse their crudest notions and do nothing to shock their prejudices. Where his judgment tells him that nothing should be done further than establishing hygienic conditions he must pander to their folly and write a prescription. He always does the best he dare or the sufferers, but the amount of benefit he can bestow varies with the violence and character of the prejudices he has to meet. A man whose nature will not permit him to waver from what he knows to be or the best interests of his patients, is constantly the object of adverse criticism and doubt. Where success promptly crowns his efforts he gets some raise. Where there is delay and no prompt signs of aim he is usually dismissed amid disrespectful criticisms from those he has failed to please.—*Popular Science News*.

Patent Office Business.

APPLICATIONS FOR PATENTS.

[Compiled from the *Illustrated Official Journal (Patents)*.]

Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 3985.—Improvements in photographic cameras. February 25, 1895.
- No. 4003.—Improved device for cutting hollow gelatin articles.* February 25, 1895.
- No. 4179.—An improved apparatus for effecting the cooling of liquids. February 26, 1895.
- No. 4194.—A new substance for the cure of toothache and the like. February 27, 1895.
- No. 4240.—Improvements in the wiring of corked bottles and apparatus therefor.* February 27, 1895.
- No. 4252.—Improved coin-freed apparatus for delivering liquids. February 27, 1895.
- No. 4277.—Improvements in photographic cameras. February 28, 1895.
- No. 4299.—Improvements for securing hermetically the stoppers or covers to jars, bottles, and other vessels. February 28, 1895.
- No. 4327.—A new lotion for outward application for the cure of eczema, scrofula, blotches, and other like skin diseases.* February 28, 1895.
- No. 4352.—Improved apparatus for measuring liquids. February 28, 1895.
- No. 4341.—An improvement in or relating to appliances for distributing perfume, antiseptic, and like essences or extracts for disinfecting purposes. February 28, 1895.
- No. 4431.—Improvements in photographic plate-holders. March 1, 1895.
- No. 4432.—Improvements in photographic film-holders. March 1, 1895.
- No. 4436.—A new or improved medical preparation for human use. March 1, 1895.
- No. 4478.—Improvements in medical appliances. March 2, 1895.
- No. 4506.—Improvements in apparatus for heating oil or other liquids.—March 2, 1895.
- No. 4514.—Improvements in sterilising and purifying liquids. March 2, 1895.

PATENTS PUBLISHED MARCH 2ND.

Artificial Legs (Judd, A. T.).—The invention consists in the application of an indiarubber buffer to the artificial leg to prevent jarring in walking. No. 2876 of 1894.

Desilverising Lead (Swan, J. W.).—The lead is run in a finely-divided condition or stream into molten zinc, which floats upon a layer of lead. As the lead traverses the zinc, it parts with its silver to the zinc and sinks through into the lead below. The latter constantly runs away into another vessel, where it is similarly treated. The treatment is repeated as often as required, and the zinc, when rich enough in silver, is smelted as usual. No. 3223 of 1894.

Treating Gout, etc. (Zimmermann, A. A communication from the Chemische Fabrik auf Actien, of Berlin).—The invention comprises the use of various organic bases in place of lithia, etc., for the treatment of uric acid diathesis. Piperazine is said to have given the best results. Where the bases have a caustic action, as is the case with tetra-ethyl-ammonium hydroxide, a carbonate or salt with an organic acid is used. The following salts, which are described as new, have been prepared for the above purposes:—the tartrate, citrate, and lactate of piperazine, the double tartrates of piperazine, with ammonium, potassium, sodium, lithium and tetra-ethyl-ammonium, the tartrate, citrate, carbonate, acetate, and lactate of tetra-ethyl-ammonium, and the double tartrates of that base with sodium, potassium, and lithium. No. 6033 of 1894.

Bottles and Stoppers (Mousley, F.).—The neck is provided with a lip, and the stopper consists of a hollow plug with one side cut away so that liquid may be poured out without removing the stopper when the latter is moved into a certain position. No. 7339 of 1894.

Solder for Aluminium (Taylor, S.).—A solder for aluminium and aluminium alloys, is prepared by alloying

together in a stated manner, 12 parts of silver, 4 of copper, 4 of aluminium, 8 of zinc, 2 of lead, and 70 of tin, all by weight. No. 7380 of 1894.

Electro-Deposition of Alloys (Thoma, W. A., and Burgum, W. H.).—For purposes where a coating of an alloy rich in an expensive metal is required, it is common to first coat the article with an alloy poor in the expensive metal, and to finish off with a coating of that metal or of an alloy rich in it. The invention relates to the deposition of alloys of platinum, iridium, palladium, etc., with tin, cadmium, nickel, cobalt, copper, aluminium, zinc, etc., and comprises various mixtures for the electrolytic bath, from which a coating containing any desired proportion of the rare and baser metal can be deposited. The temperature employed for most of the baths is 80° F. The anode may be of the rare or baser metal, or of the alloy, or may be of carbon, the solution being kept up to the required composition as deposition goes on. No. 7363 of 1894.

Refining Butter, Lard, Oils, etc.—(Mills, B. J. B. a communication from Campbell, J. H. and C. H.). Rancid butter, lard, cocoa-nut oil, cotton-seed oil, etc. are refined by alternately blowing air through them while melted, and passing a stream of water through. The air desiccates the albuminous bodies to which the inventors attribute the ill-odour and flavour, so that they are in a fit condition for being washed away by the water. No. 15,686 of 1894.

Hair Wash.—(Haddan, H. a communication from Bouffard, J. de). A preparation for dressing the hair is prepared by mixing 1 part of grape or raisin wine, 1/20th part of a vegetable oil such as oil of almonds and 1/100th part of potash or soda. No. 19,899 of 1894.

Softening Water (Brothers, W.).—Comprises the use of hydrogen ammonium carbonate "dissolved in hot or boiling water." No. 10 of 1895.

Invalid's Bed (Payne, G., Scott, J., and Hill, D. L.).—The invalid lies upon a canvas stretcher upon the bed proper, various ratchet and other arrangements serving for adjusting his position. No. 117 of 1895.

Musk (Mallmann, W.).—The inventor states that by nitrating various ketones (see specification No. 4018 of 1894) a series of bodies possessing the odour of musk may be produced. As an example, he describes the nitration of the ketone obtained by treating butyl-xytol with acetyl chloride and aluminium chloride by Friedel and Craft's method. It is introduced into ten parts of ice-cold fuming nitric acid of 1.525 sp. gr., and the "nitrating" mass is poured upon ice. The nitro-ketone (dinitro-methyl-acetophenone) is washed with water and soda solution, and crystallised from alcohol. No. 417 of 1895.

PATENTS PUBLISHED MARCH 9TH.

Lead Oxides (Ferranti, S. Z. de, and Noad, J. H.).—The invention comprises arrangements for producing litharge and red lead by passing lead in a finely divided condition, as in the form of spray, into a heated chamber through which air or oxygen is passed. A better quality of oxide is obtained by using lead carbonate instead of the metal. When red lead is being prepared, the product obtained may be passed through a second and third treatment. No. 3372 of 1894.

Disinfectant (Stephens, R. J., and Hewes, J.).—A disinfectant and deodorant for urinals, etc., is prepared by mixing stated proportions of "Crich" lime, oak or other wood charcoal, alum, and camphor. Either the alum or the camphor may be omitted from the mixture. No. 5066 of 1894.

Respirator (Bennett, F.).—The respirator fits over the mouth and nose, and has a separate inlet and outlet. Valves are so arranged that the indrawn air traverses the filtering or disinfecting medium used with the respirator, while the exhaled breath escapes without passing through such medium. No. 6532 of 1894.

New Books and New Editions.

CHEMICAL MANUFACTURERS' DIRECTORY, 27th Edition. (Simpkin, Marshall and Co.)

INTRODUCTION TO PHYSIOLOGICAL PSYCHOLOGY. By D. TRIMEN. (Swan, Sonnenschein and Co., London.)

A STUDENT'S TEXT-BOOK OF BOTANY. By S. H. VINES, M.A., D.Sc., F.R.S. Second half. (Swan, Sonnenschein and Co., London.)

Notes and Queries.

ICE SUPPOSITORIES.

[809.] The use of conical ice suppositories, *per rectum*, has recently been recommended by two professors in the Military Academy of Medicine, St. Petersburg, in cases of cancer, ulceration, obstinate diarrhoea, hemorrhoids, etc., as well as in cases of poisoning by opium, chloroform, or alcohol. The suppositories contain the equivalent of a fluid ounce of water each, and from two to ten are used daily. They are said to relieve pain, itching, etc., lower the temperature in fever, and by reflex action stimulate the heart and the respiration (*Modern Medicine*, iv, 12).

MARCHAND'S PEROXIDE OF HYDROGEN.

[810.] This solution is said to be free from soluble salts, to require not more than 2 C.c. normal alkali to neutralise the free acid in 100 C.c., and to contain at least 15 volumes of available oxygen. It is supplied only in 1/4 lb., 1/2 lb., and 1 lb. bottles, at the price of \$1.00 per pound, and is best used, after dilution with water, in the form of a spray.

SYR. VIT. IDÆI.

[811.] This preparation is probably similar to the *Syrupus Myrtilli* of the Germans and *Sirup d'airée myrtille* of the French, the juice of the cowberry being substituted for that of the bilberry. The properties of the two are said to be practically identical. The syrup may be prepared by expressing the juice from the fruits, allowing it to stand for some time at temperature of 20° C., and filtering, after which each 350 Gm. add 650 Gm. of sugar, so as to make 1000 Gm. of finished product. The French syrup is made by dissolving 5 Gm. of *Extrait d'airée myrtille* (prepared by evaporating the fruit juice to a pilular consistency) in 1 kilo. of boiling syrup.

REMEDY FOR INSECT STINGS.

[812.] The *Medical Chronicle* gives the following formula for a paint for the stings of insects, the use being to keep ammonia in close and prolonged contact with the affected parts:—R. Aq. ammoniac, m.d.; collodion, gr. i.; acid salicylic, gr. v. A few drops to be applied to each bite or sting.

STAINING FRESH TUBERCULAR SPUTUM.

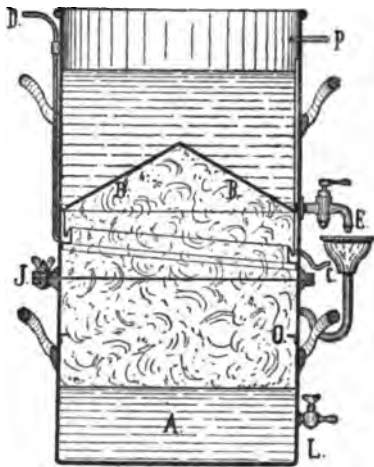
[813.] According to Kanthack and Drysdale, a thin layer of the sputum should be poured into a glass dish placed on a dark background, and one of the characteristic yellowish particles picked out with a pair of fine-pointed forceps. This should then be squeezed between two clear cover-glasses, the films are allowed to dry in the air and then passed three times through the flame of a spirit-lamp or Bunsen burner. The glasses may then be floated on a warm carbol-fuchsin solution for two to five minutes, washed rapidly in water to remove excess of fuchsin, decolorised in 25 per cent. hydrochloric acid, washed in 60 to 70 per cent. spirit till no more red comes off, washed in water to remove spirit, dried between filter paper, and again passed through the flame three times. Next stain in Löffler's methylene blue for ten to twenty seconds, wash once more in water, dry between filter paper, and again pass through the flame. Finally, mount in xylol balsam, and on examination the bacilli will be seen to be stained red on a blue ground. It is suggested that the water, acid, spirit, and methylene blue should be kept in wide-necked glass-stopped pots. The cover-glass is held in a pair of forceps, and passed successively from one pot to another, thus effecting economy both of time and material.

Novelties.

NEW AUTOMATIC STILL AND EXTRACTION APPARATUS.

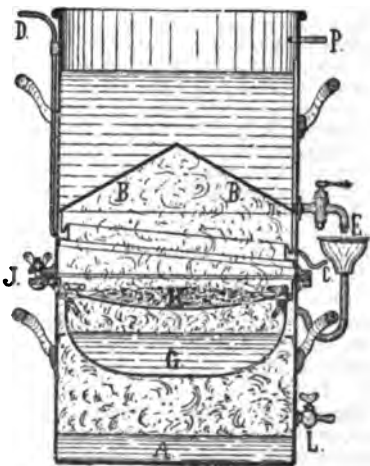
This apparatus consists of two cylinders (Fig. II.), one of which fits into the other. For the distillation of water, the liquid is poured into the lower cylinder up to the level of the tap L, and then heated. The water supply is connected with the tube D, and the cold water allowed to

II



run into the refrigerator in the upper cylinder. On heating, the steam given off is condensed on the cone BB, and the drops of distilled water trickling down collect in a gutter and run out by the tube C. By opening the tap E, so as to allow water from the refrigerator to flow into the funnel C, the level at A is kept constant, any excess overflowing from the tap L, and the operation

III.



thus becomes automatic. If perfumed waters are required, sieve H (Fig. III.) is placed on the supports O (see Fig. II.) and the flowers, etc., are placed thereon, so that the steam extracts the perfume in its upward passage. Alcohol, ether, and other volatile fluids may be distilled by inserting the water bath G (Fig. III.) in the lower cylinder, connecting a funnel (not shown in illustration) above the flange J with a vessel containing the

liquid, and then proceeding as before. The still is patented, and the agents are Messrs. Butler, Jones, and Durholdt, 140, Leadenhall Street, London, E.C. It is made in four sizes, distilling 1, 2, 3, and 4 litres of water per hour, respectively, and is constructed of solid copper, tinned inside. The apparatus should prove extremely useful to pharmacists and chemists.

Poisoning Cases and Inquests.

Laudanum.—George Clarke, aged 37, died at Eastbourne on Saturday, March 2, from the effects of laudanum, accidentally administered by himself. Verdict: "Death was caused by the accidental taking of laudanum."—*Bournemouth Observer*.

Oxalic Acid.—Alice Western, aged 29, died at Hertford Place, Tottenham Court Road, London, on Saturday, March 2, from the effects of oxalic acid, self-administered. Verdict: "Suicide while of unsound mind."—*Echo*.

Cyanide of Potassium.—John Wright, aged 56, died on Sunday, March 3, at 25, Park Street, London, from the effects of cyanide of potassium, self-administered. Verdict: "Suicide during temporary insanity."—*Daily Telegraph*.

Strychnine.—Agnes Bates, aged 18, died on Sunday, February 24, at Stourport, from the effects of strychnine contained in a packet of vermin-killer. Verdict: "Deceased died from taking poison while in an unsound state of mind."—*Worcester Chronicle*.

Carbolic acid.—Isabella Cartwright Pratt, aged 22, died on Saturday, March 2, at Bilston, from the effects of carbolic acid self-administered. During the evidence heard at the inquest held on Monday, March 4, a juryman noticed that the bottle had no label "poison" upon it, and asked whether it was usual for carbolic acid to be sold without a label? The coroner replied that he had seen carbolic acid sold in Wolverhampton without being labelled, but not of that strength. Dr. Smith also said that he quite agreed with the juryman that carbolic acid of that strength should not be sold without a label. Verdict: "Deceased poisoned herself by taking carbolic acid, but that there was not sufficient evidence to prove the state of her mind at the time."—*Wolverhampton Express and Star*.

Spirit of Salt.—John Hopewell, aged 55, died on Saturday, March 2, in the General Hospital, Nottingham, from the effects of spirit of salt, self-administered. Verdict: "Suicide whilst in an unsound state of mind."—*Nottingham Guardian*.

Prussic Acid.—Henry Beardmore Smythe, a medical assistant, died on Saturday, March 9, at Poplar, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst of unsound mind."—*Echo*.

Laudanum.—Isabella Jane Kynoch, aged eighteen months, died at Methilock, on Thursday, March 7, after swallowing a quantity of laudanum.—*North British Daily Mail*.

Carbolic Acid.—George Haley, aged 50, died on Thursday, March 7, at 76, Lady Somerset Road, Kentish Town, from the effects of carbolic acid, self-administered. Verdict: "Suicide while of unsound mind."—*Standard*.

Laudanum.—Francis H. Smith, a gentleman, died at Nedderton on Monday, March 4, from the effects of laudanum, self-administered. Verdict: "Suicide during temporary insanity."—*Newcastle Daily Journal*.

New Companies Registered.

[Compiled from the *Financial News*.]

AUSTRAL VENTURE SYNDICATE, LIMITED.—Registered by Hephburn, Son, and Cutcliffe, Bird-in-Hand Court, E.C., with a capital of £50,000 in £100 shares. Object, to acquire mines, mining rights, metalliferous, and other land, and to carry on the general business of a mining, milling, and smelting company in all its branches; to establish and carry on electrical, chemical, and other works in Australia or elsewhere; to acquire, develop, and turn to account land by planting, draining, farming, etc.; to construct and maintain rail and tram roads, waterworks, telegraphs and telephones, and other public works; as bankers, company promoters, dealers in gold, silver, diamonds, etc.; as brick-makers, ship-owners, carriers, hotel keepers, printers; and to carry on all kinds of insurance business, except life assurance. The signatories are:

	Shares.
W. Trubshaw, 6, St. Bene't Place, E.C.	5
J. Cutcliffe, 7, Adams Court, E.C.	5
F. O'S. B. Reach, 89, Warwick Road, Earl's Court	5
J. S. Hephburn, Bird-in-Hand Court, E.C.	5
L. S. Barber, 2, Drapers' Gardens, E.C.	5
F. W. Bridgford, 2, Drapers' Gardens, E.C.	5
J. V. Ley, 7, Adams Court, E.C.	5

The first directors—to be not less than three nor more than six—are to be elected by the signatories. Qualification, five shares. Remuneration, £200 per annum and a percentage of the profits, divisible. Registered office, 6, St. Bene't Place, E.C.

CONSOLIDATED ESTATES OF CAPE COLONY, LIMITED.—Registered by Ballen and Co., 28, Great George Street, Westminster, with a capital of £1,500,000 in £1 shares. Object, to acquire, by purchase or otherwise, any farms, lands, buildings, or other property in South Africa or elsewhere, and to develop and turn to account the same; to search for and render marketable diamonds, gold, silver, coal, copper, plumbago, gypsum, manganese, etc., and as miners and smelters generally; as farmers and graziers, stock raisers, fruit growers and preservers, wine and spirit merchants and distillers, warehousemen, carriers, shippers, engineers, etc.; to lay out towns, to construct and maintain rail and tram roads and other public works. The signatories are:—

	Shares.
W. W. Clayton, 28 and 29, St. Swinith's Lane, E.C.	1
V. Lambley, 85, Grondale Road, Fulham, S.W.	1
C. W. Jones, 85, Great George Street, S.W.	1
H. Allen, 12, Delahay Street, S.W.	1
A. G. Weddell, 82, Great George Street, S.W.	1
A. O. Scott, 82, Great George Street, S.W.	1
I. H. Hiley, Grange Leigh, Sutton, Surrey	1

The first directors—to be not less than five nor more than nine—are to be elected by the signatories. Qualification, £500. Remuneration, so long as there are five directors, £4000 per annum, divisible, with an additional £800 per annum for each director over five.

SOUTH AFRICAN SALTPETRE FIELDS, LIMITED.—Registered by Barraud, Regge and Jupp, 7, St. Mildred's Court, Poultry, E.C., with a capital of £750,000 in £1 shares. Object, to adopt and carry into effect an agreement expressed to be made between J. H. King of the one part and this company of the other part, and to examine, prospect, explore, and survey mines, land, and other property; to search for minerals, metals, precious stones, and other products—in particular, nitrate of potassium; to deal in nitiferous earth, nitrate of potash, nitrate of soda, salts, chlorides, asbestos, etc. The signatories are:—

	Shares.
J. Florde, 17, Victoria Street, S.W.	1
A. Fraser, Westerfield House, near Ipswich	1
A. Bull, West Marden Hall, Eversworth, Hants.	1
H. P. Barraud, 7, St. Mildred's Court, E.C.	1
J. B. Chalmers, The Elms, Highgate Road, N.W.	1
A. Jackson, 8, Copthall Buildings, E.C.	1
E. H. Jupp, 7, St. Mildred's Court, E.C.	1

There shall not be less than four directors; the first are to be elected by the signatories. Qualification, 300 shares. Remuneration, £2500 per annum, divisible.

FIELD, BREEZE AND CO., LIMITED.—Registered by Kerr and Lanham, 3, Chichester Rents, W.C., with a capital of £2000 in £1 shares. Object, to acquire and carry on the business of a chemist and druggist as hitherto carried on by J. A. E. Breeze, under the style of H. E. Field, at Birkenhead. The vendor is the first managing director. Registered office: 70, Exton Road, Birkenhead.

Personal and Trade Notes.

Messrs. Blondeau et Cie, of Ryland Road, draw our attention to the fact that in their advertisement on page of last week's Journal a mistake occurs. The words "On any of the Vinolia Preparations," which occur in the last paragraph, should have commenced a fresh sentence.

Mr. W. F. Wyley, of the firm of Wyleys, Limited, Coventry, has been elected County Councillor for the Walsgrave division of Warwickshire.

In consequence of the death of Mr. Maurice Zimmermann, of the firm of A. and M. Zimmermann, Cross Lane, E.C., on Feb. 26 last, Mr. August Zimmermann was left sole proprietor. He now announces, however, that he has taken into partnership Mr. Charles Maurice Zimmermann.

Mr. A. P. Barnard, chemist, Columbia Road, E., divisional secretary for South West Bethnal Green, a member of the vestry and of the Board of Guardians has been elected unanimously by his colleagues, the guardians, as their representative upon the Asylums Board for the ensuing three years.

The business carried on by Mr. O. Robertson, chemist and druggist, Bridge of Allan, will be continued under his name by his nephew, Mr. John Bain, pharmaceutical chemist, who has been principal assistant in the shop for several years.

Obituary.

Notice has been received of the death of the following:—

On March 2, Oswald Robertson, Chemist and Druggist, Bridge of Allan, N.B. (Aged 66.) Mr. Robertson went to Bridge of Allan thirty-three years ago, and since that time he has done much to improve the appearance of the village. Mr. Robertson took a very active interest in public affairs. For some time he was chairman of the late Curling and Skating Company, and for two years was hon. president of the Bridge of Allan Football Club, and at the time of his demise he was a Justice of Peace for Stirlingshire, a director of the Gas Light Company, of the Mineral Wells Company, of the Water Company, and a member of the Macfarlane Trust, as well as the Public Amusements Committee. His illness was of a brief duration.

On March 7, Charles Thomas Pearson, Chemist and Druggist, London. (Aged 63.)

On March 9, Thomas Evans, Chemist and Druggist Burnley. (Aged 47.)

On March 10, William Blankley, Chemist and Druggist, Arnold. (Aged 60.)

On March 10, William Mead, Chemist and Druggist Hemel Hempstead. (Aged 66.)

Publication Received.

AN INAUGURAL LECTURE ON PHARMACOLOGY AND THERAPEUTICS. By J. B. BRADBURY, M.D., F.R.C.P. Cambridge. Pp. 35. (Macmillan and Bowes, Cambridge). From the Publishers.

Market Report.

Chemicals and Drugs.

THE CHEMICAL MARKET.

THURSDAY, MARCH 14, 1896.

Since our last there has been but little business passing in the Chemical Market, and prices remain much the same as last week, any changes that have occurred representing for the most part depreciation in price. Citric acid is firmly held, but quotations are unchanged, whilst a fair amount of business has been done in tartaric acid, which closes steady at last week's rates. Oxalic acid continues fairly steady, whilst of ammonia compounds, sulphate has been a very weak market during the week, the quotations being continually on the down line. Carbonate of ammonia and sal ammoniac are unchanged. Arsenic is still in but moderate supply, and quotations are well maintained. Ashes are steady, whilst borax remains a weak market, the prices accepted by second hand-holders being still below those fixed by the Syndicate. Copper sulphate presents a steady market at unchanged rates, this also applying to cream of tartar, which is maintained at last week's rates. Mercurials and quicksilver are unchanged. Potash and soda compounds are all quiet, with the exception of "hypo," in which a fair amount of business has been passing lately, although supplies are but poor.

ACID BORACIC.—Crystals quoted at 80s., and powdered at 81s.
ACID CITRIC.—Little business done, as holders are firm at unchanged rates. Quoted at 1s. 1½d. to 1s. 2d. according to the quality.

ACID OXALIC.—Unchanged, with a fair amount of business doing. Quoted at 8½d. net ex rails.

ACID TARTARIC.—The demand continues fairly brisk both for English and foreign makes. Quotations of English makes are 10½d. to 11d. Foreign ditto, both powder and crystal, 10½d.

AMMONIA SALTS.—Sulphate: The steady feeling in this has not been maintained, the market having been very weak, with prices continually depreciating. At the close it is quoted £11 2s. 6d. for grey 24 per cent. Carbonate: As was to be expected, this has not been offered by the fall in sulphate, and last week's quotation of 8½d. to 8¾d. still holds. Sal ammoniac: Unaltered; the quotation for first quality is still 89s., with seconds at 87s.

ASHES.—Rather scarce, and demand is steady. Prices returned are still 40s. for American, with pots at 28s.

ARSENIC.—Supply is but small, and prices are well maintained. Quoted at last week's rate of 14s. 9d. to 15s. for powdered white.

BLEACHING POWDER.—Fairly brisk, at unchanged rates. Quoted at 8s. 8½d. to 8s. 6d.

BORAX.—Continues to be a very weak market, with second-hand holders selling fully 6d. per cwt. lower than the Syndicate. Quotations are still 19s. 6d. for crystals, with 50s. 6d. powdered.

COPPER SULPHATE.—Demand continues good with unchanged quotations. Still worth £14 17s. 6d. to £15 10s., according to brand.

CREAM OF TARTAR.—The market still shows the improvement noted last week, and the quotations are very fairly maintained. Fine white French crystals are worth 68s. 6d., with powdered at 65s. 6d. to 66s.

MERCURIALS.—Unchanged. Quantities up to 28 lb. are still returned at: Calomel, 2s. 9d.; Red precipitate, 3s.; white ditto, 8s.; Corrosive sublimate, 2s. 6d.

POTASH COMPOUNDS.—The demand continues to be slack. *Prussiate*: Easy at unchanged rates, quotations still being 9½d. *Chlorate*: The market is weak, quotations ruling from 4½d. to 4¾d. *Bichromate*: Unchanged at 4½d. to 4¾d.

QUICKSILVER.—Firm at unaltered rates. Importers' prices are still £2 10s., whilst in second hands it is worth £1 9s. 6d.

SODA COMPOUNDS.—*Caustic Soda*: 70 per cent. is returned still at 28s. with 60 per cent. at £1 less. *Crystals*: Easy at 83s. *Bicarbonate*: Remains at 27 5s. (London). *Hypo-sulphite*: 26 5s. in 1 cwt. kegs. (Liverpool.)

THE DRUG MARKET.

THURSDAY MARCH 14, 1896.

Very little business has been passing in the Drug Market since our last, sales being chiefly of a retail description. The advance in Eucalyptus oil has proved to be a flash in the pan, as there is now no demand at all, and prices have fallen to their former position. The market for crude camphor is quiet at easier rates, whilst English refiners maintain their prices. Cocaine is very firm, with a likelihood to further advance, as the crude article is scarce. *Ipecacuanha* is firm. Since the last auction sales have been made privately, both in Rio and Carthagena root, at fully steady rates. Jalap is lower, fair Vera Cruz being offered privately at a

decline of 2d. to 3d. Menthol is firm at unchanged rates. Of the essential oils aniseed is dearer, holders asking for an advance of 8d. to previous quotations, whilst cassia is very easy at a fall. There has been a steady demand for opium, which is quoted at unchanged rates. Cod liver oil is very easy. In quinine a fair amount of business has been done at steady rates.

ALOE.—The market is firm at unchanged rates for all qualities of *Cape*, whilst *Curacao* is steady for good grades.

BUCHU.—Since the auctions there have been sales of fair bright green round leaves at 8½d.

CAFFEINE.—Remains steady at unchanged rates, 1 cwt. lots are quoted at 15s.; 28 lbs. 15s. 6d., smaller quantities at 16s. CAMPHOR (crude).—Remains quiet at easy rates; and little business has been done at the quotations given. Japan is offered to-day at 96s. c.i.f. terms, while Chinese camphor is quoted at 91s. 6d. c.i.f. distant shipment, whilst on the spot Japanese is held at 107s. 6d., and Chinese at 100s.

CAMPHOR (Refined).—Last week's quotations are unchanged, but the market is quiet, German and English makes in *bells and flowers* are still returned at 1s. 5½d. for 10 cwt. lots with 1s. 6d. for smaller quantities, and *Squares* at proportionate rates.

CHILLIES are very quiet, at the last sales fair Zanzibar being bought in at 28s. with good bright Sierra Leone at 82s.

CLOVES.—Zanzibar were in but small supply at the auctions, when good fine bright sold at 2¾d. Good picked Penang sold at 6¼d. without reserve. Quotations for Zanzibar for delivery are unchanged at 3¾d. April to June.

COCAINE.—Is very steady, at 18s. 9d. nominally, and is firmly held at that rate. As the stocks of crude cocaine are, however, but small, a further advance in the refined article is probable.

CODEINE.—Steady, at 12s. to 12s. 6d., with second-hand holders quoting at 12s.

COLOQUINTH.—Continues firmly held at 1s. 8d.

COPAIBA.—*Maranham* is steady at 1s. 7d., *Bahia* 1s. 8d. to 1s. 6d.

IPCACUANHA.—A fair amount of business has been done since the last sales at steady rates, both in Rio and Carthagena root, with firm closing quotations. Prices:—*Brazilian* (Rio): Good to fine annulated, 4s. 9d. to 5s.; fair, 3s. 6d. to 4s. 6d. *Columbian* (Carthagena): Fair first-class damaged, 8s. 6d.; second ditto, 8s. 8d.

JALAP.—Is lower by 2d. per lb. Privately, fair Vera Cruz is offered at 1s. 1d.

MENTHOL.—Is steady at unchanged rates. The best brands are quoted at 15s. spot for good white crystals, whilst forward rates are 14s. to 14s. 6d., C.i.f. terms.

MORPHINE.—Unchanged at 5s.

OILS (Essential).—Aniseed is dearer, privately 5s. 10d. has been bid and refused, holders asking 5s. 11d. to 6s., forward quotations are 5s. 11d. c.i.f. Cassia is easier. It is quoted on the spot at 8s. 9d. to 4s. for 80 to 85 per cent oil. *Peppermint*, *H. G. Hotchkiss'* brand is a trifle easier at 9s. 9d. *Japanese* oil, 40 per cent. remains steady at last week's rates of 8s. 6d. to 9s. with demethylated oil at 6s. 6d. to 7s. *Lemon* oil: A fair quotation for a brand of guaranteed purity would be 4s. 6d. *Lemon-grass*: Dull and but little business doing, at 1½d. to 2d. *Eucalytus*: All interest seems to have died out, the demand shown during the past fortnight having been merely caused by the epidemic. Good *Sidney* oil is quoted at 1s. 3d. to 1s. 4d.

OILS (FIXED) AND SPIRITS.—*Cod-liver Oil*: During the past week prices have been gradually tending lower, and finest non-congealing new oil is quoted at 170s. per barrel of 25 gallons, C.i.f. terms, whilst prime old oil is worth 160s. *Lined*: Has shown a very steady market during the week, and prices have been steadily on the rise. At the close it is quoted at £21 15s. to £22. *Cotton* has been fairly steady, and the market is very easy at quotations of £16 15s. to £17 10s., according to brand. *Coco-nut*: Quiet. Ceylon is quoted £23 15s. to £28; Cochin, £25; Mauritius, £23 15s. to £28. *Rape* is steady at unchanged rates. Refined oil is worth £21 15s. to £22. *Turpentine* still continues to rise steadily, and the closing rates show advance of 6d. to 9d. on last week's quotation. Price for American spirit is now 22s. 8d. *Petroleum*: Remains firm at last week's quotations. American oil is worth 5½d., with Russian at 4½d. *Petroleum Spirit*: Ordinary, 7d.; deodorised, 7½d. to 7¾d.

OPIMUM.—Business has been at last week's rates. Quotations:—Turkey: soft shipping description, 12s. to 12s. 6d.; best druggists, 10s. to 10s. 6d.; second ditto, 9s. to 9s. 6d. Persian, 11s. 9d. to 12s.

PHLOCARPIN.—Continues very scarce, and quotations are well maintained. *Hydrochlorate* and *Nitrate* are very steady at 7s. 6d. to 8s. 6d. per gramme.

QUININE.—A fair amount of business has been done during the week at steady rates. *Brunswick* has been selling at 11½d., and *B. & S.* at 11¾d. At the close there are buyers of the best German makes at 11s. ¾d.

SHELLAC.—The demand is very poor, but prices are steady in spite of the unimportance of the sales. Some retail sales of T.N. orange on the basis of 108s. have been made, with fair A. C. Garnet quoted at 104s.

SOY.—Remains very dull at low quotations fair China being worth 10d.

WAX (Bees).—Very steady. Jamaica wax is worth £8 10s. to £8 15s., with Madagascar at £7 to £7 10s.

Diary of the Week.

Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, MARCH 16.

Pharmaceutical Football Club v. Breweries at Wormholt Farm, Shepherd's Bush, at 8.15 p.m.

SUNDAY, MARCH 17.

Sunday Lecture Society, at 4 p.m.

"Silver from Clay: the remarkable story of the metal aluminium" (Illustrated), by W. Mayhew Heller.

MONDAY, MARCH 18.

Imperial Institute, at 8.30 p.m.

"Photography as an Instantaneous Recorder," by Lyonel Clark.

Society of Arts (Cantor Lectures), at 8 p.m.

"Commercial Fibres," by Dr. D. Morris.

TUESDAY, MARCH 19.

Royal Institution of Great Britain, at 8 p.m.

"The Internal Framework of Plants and Animals" (Tenth Lecture), by Professor Charles Stewart.

Society of Arts (Applied Art Section), at 8 p.m.

"Practical Carpet Designing," by Alexander Millar.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

Aberdeen Chemists' and Druggists', Assistants', and Apprentices' Association, at 9.30 p.m.

Paper by James Clark.

WEDNESDAY, MARCH 20.

Imperial Institute, at 8.30 p.m.

Ladies' Concert.

Geological Society of London.

Special General Meeting at 7.45 p.m.

"The Bajocian of the Mid-Cotteswolds," by S. S. Buckman, at 8 p.m.

"On Fluvio-glacial and Inter-glacial Deposits in Switzerland," by C. S. du Roi de Siquerra.

Royal Microscopical Society, at 8 p.m.

"Patents connected with the Microscope from 1666 to 1800 A.D.," by W. H. Brown.

Society of Arts, at 8 p.m.

"The Progress of the Abattoir System in England," by H. F. Lester.

Pharmaceutical Football and Cricket Club, at 7 p.m.

Annual Dinner to be held at the Queen's Hall, Holborn Restaurant.

Western Chemists' Association (of London).

Discussion on the forthcoming New Edition of the British Pharmacopoeia, introduced by W. Martindale.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.

Communications by W. F. Hay, Alex. Murray, and J. H. Burns.

Sheffield Pharmaceutical and Chemical Society, at 8.30 p.m.

"Recent Research in the Micro-Structure of Steel," by Prof. Arnold.

THURSDAY, MARCH 21.

Royal Institution of Great Britain, at 8 p.m.

"Three Periods of Seventeenth Century History," by S. R. Gardiner.

Imperial Institute, at 4.30 p.m.

"Indigo and its Modern Substitutes," by Professor J. J. Hummel.

Linnean Society of London, at 8 p.m.

"Observations on the Lorantheaceae of Ceylon," by F. W. Keeble.

Chemists' Assistants' Association, at 8.30 p.m.

"Sanitation," by E. Goulding.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

"Dispensing Notes," by F. Walker.

"Pharmacy Notes," by T. S. Wokes.

"Digestive Ferments," by Edwin Williams.

Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.

"Pharmacy Notes," by R. Brodie.

Chemical Society, Burlington House, at 8 p.m.

"Studies in Isomeric Change (Part III.): the Ethylbenzene-sulphonic Acids," by Dr. G. D. Moody.

"Some Oxypyridine Derivatives," by Miss Sedgwick and Dr. Collier.

"On the Colouring Principle of *Toddalia aculeata* and *Kvodia meliastolia*," by A. G. Perkin and J. J. Hummel.

FRIDAY, MARCH 22.

Pharmaceutical Society of Great Britain, at 8.30 p.m.

"Decomposition of Alcohol-reducing Chloroform," by D. Brown and D. R. Brown.

"Discussion on the proposed 'Imperial' Pharmacopoeia."

Royal Institution of Great Britain, at 9 p.m.

"Emily Brontë," by Sir Wemyss Reid.

Sheffield Microscopical Society, at 8.30 p.m.

"The Micro-structure of Steel," by Prof. Arnold.

SATURDAY, MARCH 23.

Royal Institution of Great Britain, at 8 p.m.

"Waves and Vibrations" (Fourth Lecture), by Lord Rayleigh.

Geologists' Association (London), at 2.30 p.m.

Visit to the Museum of Practical Geology, Jerns Street, W.

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words, including name and address, are inserted free, but must not partake of the nature of ordinary advertisements.]

OFFERED.

BOOKS.—Woodville's 'Medical Botany,' 1st ed., newly re-bound, 80s.; 'Ph. Londinensis,' 1836, interleaved, perfect condition, 6s.—Brown, Chemist, Ampt.

WANTED.

'THE ANALYST.'—Volumes or numbers from 1886-1895 inclusive. State prices, which must be moderate, John's care of J. Robinson, 125, South Lambeth Road, S.W.

Trade Mark Applied For.

[Compiled from the Trade Marks Journal.]

185,294.—WHITE JAP BIRD-LIME, with device of a bird attached to a branch of a tree.—Kay Brothers, Limited, St. Petersgate Mills, Stockport, Cheshire. February 1, 1895. The essential particular is the device.

Late Advertisements.

Assistants Wanted.

QUALIFIED Junior ASSISTANT wanted in first-class West-end business. Must be of good appearance and address. Apply, Correspondence Office, S. MAY, SON & THOMPSON, Aldersgate St., E.C.

BY the first week in April. A Junior ASSISTANT about 22 or 23, accustomed to a good-class business. Thoroughly kept. Apply, stating full particulars, age, height, salary expected (in-door), and enclose photo to W. ADAMS, Pharmaceutical Chemist, Shrewsbury.

AT once.—Qualified MANAGER to take entire charge of small Chemist's business in suburbs of London. Must be well recommended and trustworthy. In-door. Unmarried. Write full particulars, experience, salary, &c., to J. C. H., 46, Bedford Row, W.C.

AN ASSISTANT, by middle of April. Age 25 to 30. Steady and with obliging manners. In-door. Apply, with full particulars, to E. SMITH, 21, West St. Horsham, Sussex.

Engagement Wanted.

TO Chemists and Druggists.—A well-educated and gentlemanly youth, aged 20, with some knowledge of the business, desires an ENGAGEMENT with good Chemist and Druggist. To live on the premises. Address: CHEMIST, "Pharm. Journal" Office, 5, Serle St. London, W.C.

Notes.

DISCOVERY OF NEW REMEDIES.—It is pointed out by E. Merck, of Darmstadt, that although many innovations in medical treatment have been discovered by means of serum-therapy, yet those methods have not so far had any noticeable influence on the discovery of new remedies, the medical and pharmaceutical novelties for 1894 being even more numerous than usual.

OWNERSHIP OF GOODS ON COMMISSION.—The *Pharmaceutical Era* reports that in a case recently decided in the United States Circuit Court at Chicago, the judge upheld the right to sell goods on which an execution had been levied, even though they were only held on commission. He considered that the system known as "commission invoices" was contrary to public policy, in that it gave the consignee an apparent ownership in property that did not belong to him, and enabled him to obtain credit to which he was not entitled.

'SCIENCE PROGRESS.'—The current number of this publication contains articles on "Antitoxin," by Dr. E. Klein; "Foreign Work amongst the Older Rooks," by J. E. Marr; "Insular Floras (Part IV.)," by W. B. Hemaley; "Peptone," by Dr. W. D. Halliburton; "Budding in Tunicata," by W. Garstang; and "The Reserve Materials of Plants (continued)," by Professor J. Reynolds Green.

QUEBRACHO AS A TANNING MATERIAL.—According to the *Scientific American*, the Germans can now make leather as cheaply as any other people, owing to the use of quebracho as a tanning material in place of oak bark. The wood is imported into Germany in logs, and cut into chips for use. A quebracho extract is also manufactured in two forms, described as "crystal" and soft paste. This extract yields a leather of poor colour only when used alone, but if alum and salt be used in addition, it is said to give finer results than gambier.

PRESS TELEGRAMS.—In Tuesday's *Times* the Chairman of the Press Association shows the absurdity of the Postmaster-General's recent statement that the Post Office loses some £300,000 a year from press telegrams. A large proportion of such messages being sent during the night, occupy the wires at a time when they would otherwise be unproductive of revenue at all. In addition, an enormous amount of profitable business accrues to the Post Office through the medium of newspapers, in the form of letters sent in answer to advertisements, etc.

CORROSION OF ALUMINIUM.—In the *Chemical News* for March 15, A. Liversidge describes the effects of the weather upon ordinary sheet aluminium. He finds that, though the absolutely pure metal may be permanent in the air, the best aluminium ordinarily obtainable is in that respect very little, if at all, superior to zinc. The prevalent idea that aluminium is a metal resembling gold and silver in their non-oxidising property seems, therefore, to be fallacious.

PHARMACY FAIR AT BOSTON.—This fair will be held during May in the Mechanics' Building, Boston, U.S.A., and is expected to possess several novel features, the connection of which with pharmacy is but indirect, to say the least. In addition to exhibits by the leading drug houses and kindred trades, there will be a representation of the manner in which hospital work is carried on; a "Soldiers' Home department," model school room and school kitchen, and a day nursery in practical operation (*sic*). Daily lectures and demonstrations are to be given by ladies. In the words of the *Boston Journal*, "a thousand and one things, many of which even the druggist himself never dreams, will be on view. It will be an introduction to a broader pharmacy for some pharmacists, and an education in that line for the general public." Music "of the highest order" is promised among other attractions. More serious business will be represented by the Conventions of the Secretaries of the State Boards and Commissions of Pharmacy of America, and of the Massachusetts State Pharmaceutical Association.

PROPERTIES OF ARGON.—In experimenting with some argon supplied by Professor Ramsay, M. Berthelot, the perpetual secretary of the Paris Academy of Sciences, has found that, under the influence of the silent electric discharge, it combines with benzene and other organic compounds. It would appear therefore that argon may be capable of entering into combination under not uncommon atmospheric conditions. Moist filter paper exposed to the silent electric discharge, in the presence of argon, absorbs the latter much as nitrogen is absorbed under the same conditions, but whether a compound is formed which, on heating with soda-lime, will give off ammonia, as in the case of nitrogen, remains to be seen.

BURNING EFFECTS OF EXTREME COLD.—M. Raoul Pictet has described the "cold burns" experienced by himself and his assistants during investigations at low temperatures. In some cases the skin is first red, then blue, and subsequently the area of the injured spot extends to nearly double what it was originally. There is a painful itching sensation in the surrounding tissues, as well as at the affected spot, and healing usually takes five or six weeks. In more serious cases the skin rapidly becomes detached, and there is a long and stubborn suppuration, the wound remaining open for more than six months in one instance after a drop of liquid air had fallen on the hand.

STATE-AID FOR LONDON UNIVERSITY.—The whole cost of the University of London to the nation, according to Sir Albert Rollit, is but £20 per annum, and in the House of Commons recently he protested against the niggardly manner in which the Treasury deals with the University. This view of the case was also supported by Sir Julian Goldsmid, but the Chancellor of the Exchequer (Sir William Harcourt) pleaded lack of money as the reason for not contributing to the University funds more freely.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

THE EFFECTS OF SOOTHING SYRUP.—At Worcester, on March 12, Mr. W. B. Hulme held an inquest touching the death of Alfred Price, fifteen months old, son of Frederick Price, Wellington Street.—The child had been suffering from a cold, and on Saturday afternoon the mother gave him a teaspoonful of "soothing syrup." After tea she gave him another dose of half a spoonful, and put him to bed. Early in the morning the mother found the child dead beside her. Dr. Simmons, who had made a post-mortem examination, said he found congestion of the brain, and vague evidence of bronchitis. In the stomach he found a small quantity of fluid, which had a strong acid smell. Mrs. Winslow's syrup contained opium. The congestion of the brain and the paleness of the face pointed to opium poisoning. During five years there had been thirty-two cases of death from soothing syrup. The inquest was adjourned for a fortnight for an analysis to be made to discover whether there was sufficient morphine in the body to cause death; also for an examination to be made of the contents of the bottle.—*Birmingham Daily Post*.

GLASGOW AND WEST OF SCOTLAND PHARMACEUTICAL ASSOCIATION.—At the meeting on Thursday, March 7, Dr. T. H. Bryce lectured on "The anatomy of expression." The lecture was illustrated with the lantern, and proved very instructive and entertaining, as Dr. Bryce, after pointing out the action of the muscles in the face giving expression to the mind's impulses, analysed the passions and feelings man, in common with the lower animals, is heir to. Representations of the dog, cat, monkey, and humanity of both sexes, showing how the strings were pulled, amused as well as edified, and at the close a hearty vote of thanks, proposed by the President, Mr. W. L. Currie, seconded by Mr. John Foster, was heartily accorded.

THE INVENTION OF MATCHES.—At the Borough Hall, Stockton, on Thursday, March 14, Mr. Joseph Parrott lectured on "The light of former days, and how it was obtained." Primitive methods of obtaining light were described, also the quaint processes in vogue in mediæval times. The old sulphur-tipped splints of most inflammable wood were then shown, and also the method of obtaining light by chlorate of potash and sulphuric acid. A case containing ten of the original matches made by the Stockton inventor, Mr. John Walker, was exhibited, and also Chinese matches. From these exhibits Mr. Parrott passed on to refer to the inventors of the friction matches. The dates are as follows:—The first American patent for them was taken out in 1836. Janos Irmsl, the Hungarian, made the discovery in 1835. He sold it for £700. He was still living in the South of Hungary. Kammerer, the German, discovered it in 1833, and Sauria, the Frenchman, in 1831. He still enjoyed a pension for his discovery. Sir Isaac Holden's discovery was in 1829, but the late Mr. John Walker, of Stockton, took priority of all, he having invented it in 1827, as his day book proved by the sales entered in it, and thanks to the courtesy of Mr. Hardcastle, Finkle Street, chemist, the lecturer had again had lent to him the original book.—*Northern Echo*.

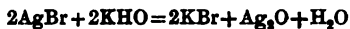
A CHEMIST'S ASSISTANT CENSURED.—An inquest was held on March 14, in the Harrington Arms Inn, Long Eaton, relative to the death of Albert Edward Lowe, 19 years of age, of 20, King Street, Long Eaton, who died on the previous Tuesday morning. On the Monday deceased was ill, and his mother got some medicine from Mr. H. Swift, assistant to Mr. G. Start, chemist. Dr. Syster was sent for early the following morning, but the young man died soon after he arrived. On the Wednesday a post-mortem examination was made, and death was found to be due to meningitis, or disease of the brain, through natural causes probably. Dr. Syster saw some medicine, and found prussic acid in it, but he could not say to what extent. It was stated that the prescription was an ordinary one for biliousness. Dr. Syster said hydrocyanic acid ought not to be given in a haphazard way. After full inquiry, it was admitted by Mr. Swift he was not qualified to dispense poisons, and the jury, while returning a verdict of "Death from natural causes," censured Mr. Swift for using poisons in that way. It was a custom that must not be continued by him until he was fully qualified to do so.—*Nottingham Daily Express*.

BRIGHTON CHEMISTS' BALL.—The fifth annual ball, promoted under the auspices of the Brighton Junior Association of Pharmacy, was held at the Royal Pavilion, Brighton, on March 15. Dancing to well-selected music, furnished by Mr. Pullen's band, took place in the Music Room. The North Drawing Room was reserved for supper and light refreshments, and the Corridor was turned into a pleasant lounge and promenade. The arrangements were carried out by the following stewards: Messrs. C. G. Yates (President of the Association), F. Beckwith, A. E. Colman, C. Crowhurst, A. H. Cupit, E. S. Goeling, H. B. Gibson, B. Greening, T. F. Grindley, A. T. Jeeves, C. Kent, A. P. Nosworthy, and H. Gay Price, assisted by the Hon. Secretary, Mr. F. A. Crowhurst, and were found eminently satisfactory. The function, which proved to be one of the pleasantest held in connection with the Association, was extended into the small hours.—*Sussex Daily News*.

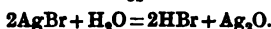
"THE PHYSICS AND CHEMISTRY OF DEVELOPMENT."

—On Monday evening last, at the Cordwainers' Hall, 7, Cannon Street, E.C., the second and concluding lecture upon the above subject was given by Mr. T. Bolas, F.I.C., F.C.S. The chair was again taken by Sir H. Trueman Wood, and there was a numerous attendance. The lecturer continued his remarks at some length upon the researches of Messrs. Lodge and Hertz into the electrical action of light, illustrating the principal points by experiments. Investigations by Professor Meldola have also tended to support the view that the action of the developer is largely dependent upon the closing of an electric circuit. The bitumen process, introduced by Niepce in 1810, was then described and demonstrated. A copper plate coated with a layer of bitumen having been exposed to light with certain parts covered by paper of a non-actinic colour, was treated with a weak solvent, that used being a very old and oxidised sample of turpentine, which readily dissolved away the protected portions of the bitumen film, the light having had the effect of rendering the remainder much less soluble. In this process a very long exposure is necessary, but that it is capable of producing an image of full gradation was evidenced by a specimen transparency handed round for inspection. In 1839 Daguerre and Niepce entered into partnership, and the former published his process, in which a silver plate was converted upon its surface into a haloid salt of silver, and the development effected by exposure to the vapour of Hg, the mercury

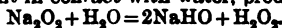
being considered to be merely an addition to the silver of the image. This was a somewhat crude view. A more thoughtful one was expressed by the Rev. W. T. Kingsley in 1853, who showed that the development of the daguerreotype plate could be accomplished with pyrogallol, and contended that the Hg was not merely in addition, but had also a reducing action. The case of development by special reaction was then considered, this including all ordinary cases of development of gelatino-bromide plates. In addition to the reducing substance, either an alkali or water must be present, and the reaction in its first phase may be thus expressed:—



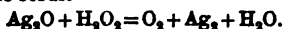
or



The developing material, being a reducer or deoxidising substance, then extracts the O from the Ag_2O , an image being thus formed in metallic silver. One remarkable exception was mentioned, in which a powerful oxidising agent is capable of acting as a developer, viz., that of sodium peroxide, Na_2O_2 , which, when brought in contact with water, produces H_2O_2 —



When this reaction takes place in the presence of Ag_2O , the following equation, according to Brodie, expresses the result—



After referring to the properties of Au, Ag, Pt, and Pd, of occluding substances in a state of vapour, which he thought might afford some clue to the action of the vapour of Hg in the development of the daguerreotype plate, the lecturer concluded by expressing an opinion that the electrical experiments of Messrs. Lodge, in England, and Hertz, in Germany, had opened a most promising field for investigation of this object.

MIDLAND PHARMACEUTICAL ASSOCIATION.—A social meeting of this Association was held at the Midland Hotel, Birmingham, on Thursday, March 14. The evening proved a most enjoyable one. A larger number of pharmacists than usual were present, and the contributions of music (instrumental and vocal) were thoroughly appreciated. The Chairman (Mr. Hibbs) congratulated the members on the increased attendance, and announced, to the evident satisfaction of all present, that an extra social meeting would be held on the last Thursday of April. The next meeting of the Association is at the Mason College on April 11.

ROYAL INSTITUTION.—On Tuesday, March 12, Professor Stewart passed to the consideration of the internal framework of *Echinodermata*. The sea-leathers secrete calcareous plates, which are moulded in the form of the rock to which the creature is attached. In the radiating arms calcareous plates are formed, and in grooves in the flesh with which these are clothed, numerous ciliated epidermal cells create a current of water towards the mouth. By fracture of the stem the creature is liberated from its attachment, but is enabled, by production of numerous law-like processes, to grasp the rock or release itself.

The *Ophiuridea*, or brittle-stars, possess five arms and contain both an endoskeleton and an exoskeleton. The former consists of vertebral ossicles in the arms, to which muscles are attached, protected by dorsal and ventral plates. From lateral plates spiny processes arise. In the sea-urchins the endoskeleton consists of five sets of plates, each set composed of a number of pairs. These plates are either perforated for feet and armed ambulacral, or imperforate or inter-ambulacral, the latter alternate with the former. On the lower surface of the sea-urchin is an aperture, within which

is a plate bearing arched appendages; through these pass the systems of nerves and of water-vessels, and to them are also attached muscles by which the creature's jaws are moved.

In the succeeding lecture on March 19 Professor Stewart dealt first with *Spirographis spallanzanii*, a beautiful annelid found near Naples. This animal produces a bundle of feather-like filaments supported on a cartilaginous spiral, from which arise cartilaginous rods. These act as sensory organs, and by establishing currents of water serve as well to gather food and aerate the blood. In brachyopods the folded mantle which lines the shell sends prolongations into the interior which afford an endo-skeleton. In arthropods the endo-skeleton is often only a similar inward prolongation of the exo-skeleton, which serves not only to protect the internal structures, but as a point of attachment for the muscles. The king-crab and scorpion furnished further examples on which the lecturer based descriptions of modifications of the endo-skeletons. The lectures were illustrated by specimens of *Ophiocoma*, *Antedon*, *Phyllacanthera*, *Terebratulula*, *Waldheimia*, *Limuleus*, *Spirographis*, etc.

DEFICIENT SEIDLITZ POWDERS.—At Todmorden Petty Sessions, on March 14, Robert Newell, herbalist, Cheapside, Todmorden, was fined 5s., with 23s. costs, for selling seidlitz powders that weighed 4½ grains short of what was required by law.

UNIVERSITY COLLEGE (LONDON) CHEMICAL AND PHYSICAL SOCIETY.—Professor Ramsay, F.R.S., occupied the chair at the annual public meeting on the 19th inst., when Professor C. V. Boys, F.R.S., gave a lecture entitled "Weighing the Earth." After some introductory remarks, dealing with Newton's law of gravitation and the attraction of spheres, a brief sketch was given of the methods used by various investigators in this subject, and the value of the results obtained by them. Cavendish, nearly a hundred years ago, by using Michelson's apparatus, investigated relatively the mass of the earth as compared with the moon, sun, and various planets, and his efforts met with extraordinary success, when we consider the difficulties he laboured under in his research. But his results, as well as those of subsequent workers, only gave the relative masses of the various planets, compared with the earth as unity. But by means of the elaborate apparatus described by Professor Boys, the absolute weight of the earth can be determined. The experiments necessary for the purpose were conducted in underground laboratories at Oxford, placed at Professor Boys' disposal by Professor Gordon, and so great is the accuracy now obtained that errors of 1 in 10,000 can be detected.

The lecture took the form of a detailed lantern demonstration of the various mechanical and chemical details of the apparatus employed, which Professor Boys himself constructed, and of the various precautions taken to obtain absolute compensation and prevent the results being vitiated.

Professor Ramsay, in proposing a vote of thanks, expressed the opinion that no research had ever required more patience or stricter attention to the minutest details.

After the lecture Professor Ramsay announced that he had received an intimation to the effect that Professor Olszewski, of Cracow University, had at last succeeded in determining the critical point and boiling point of hydrogen to be -233 and -243 respectively at ordinary atmospheric pressure. This naturally caused considerable interest, but Professor Ramsay could give no further particulars, and they will be published in due course by Olszewski.

PHARMACEUTICAL FOOTBALL AND CRICKET CLUB.

—The annual dinner of this Club was held at the Holborn Restaurant, London, on Wednesday, the chair being taken by Professor Atfield, who was supported by Mr. Michael Cartelghe, President of the Pharmaceutical Society, Professor Greenish, Mr. Richard Bremridge, and other officers of the Society. There was also a fair muster of old students of the School of Pharmacy, and a most enjoyable evening was spent, the musical programme being, as usual, exceedingly attractive.

Press Comments.

COLOURS IN PHOTOGRAPHY.—It has often been observed that a bright scarlet uniform will in a good photographic dark-room with ruby-glass windows, appear perfectly white. On this subject Herr H. W. Vogel made some interesting communications to the Physical Society of Berlin at a recent meeting. Experimenting with oil lamps provided with pure red, green, and blue colour screens, he found that when white light was rigidly excluded, all sense of colour disappeared to the observers, and nothing but shades of black and white could be distinguished on objects in the room. He further found that a scale of colours illuminated by red light showed the red pigments as white or grey, which abruptly turned into yellow, and not red, on adding blue light. Hence a colour was perceived which was not contained in either of the sources. Red and yellow patches appeared of the same colour, so that they could hardly be distinguished. But the difference was at once brought out by adding green instead of blue light. How very much the kind of sensation experienced depends upon the intensity of illumination is easily seen in the case of the region of the spectrum near the G. line of Fraunhofer. This region appears violet when its luminosity is feeble, blue when it is stronger, and may even appear bluish-white with strong sunlight, so that the assertion often made that with normal eyes a definite colour-sensation corresponds to a definite wave-length, cannot be upheld. Herr Vogel comes to the conclusion that our opinion as to the colour of a pigment is guided by our perception of the absence of certain constituents. Thus a red substance is only recognised as such when light of other colours is admitted, and we perceive its inability to reflect these.—*Nature*.

THE FALLACY OF EARLY-RISING.—Proverbs are responsible for a great deal of folly, and none, perhaps, for more mischief under the present conditions of town life, than those which inculcate early-rising as a virtue. When the great majority lived in villages and were engaged in the cultivation of the soil, early-rising may have been conducive to health and wealth, if not to wisdom, but even our early forefathers probably did no more than make a virtue of necessity. It is said to be natural—that is, physiological—to rise early and enjoy the beauties of the sunrise; if we ask why, we are treated to various transcendental theories about the vivifying influence of the sun, and are told to take example by the birds of the air and the beasts of the field, or so many of them as are not nocturnal in their habits. But, as a matter of fact, physiology, so far as it has anything to say on the subject at all, is all against the early-rising theory. Physiological experiment appears to show that a man does not work best and fastest in the early morning hours, but on the contrary, about midday. The desire to rise early, except in those trained from youth to outdoor pursuits, is commonly a sign, not of strength of character and vigour of body, but of advancing age. The very old often sleep much, but they do not sleep long. A long deep sleep, the sleep of youth, requires for its produc-

tion a thoroughly elastic vascular system. The stiffening vessels of age are not so completely nor so easily controlled by the vasomotor nerves. Hence shorter sleeps. Thus paterfamilias, who goes to bed at eleven p.m., wants to get up at five or six a.m., and looks upon his healthy son who prefers to lie till eight as a sluggard. When this foolish interpretation of a proverb about the health and wealth to be got from early-rising is combined with the still more foolish adage, which says of sleep, "six hours for a man, seven for a woman, and eight for a fool," then we have a vicious system, capable of working great mischief to young people of both sexes. There is a tendency greatly encouraged in towns by the spread of cycling, to curtail unduly the hours of sleep. Parties of young men and lads are to be met careering about the streets at midnight. They would be far better in bed. They have, probably, to be in their offices or shops by nine a.m., or even earlier, and when time is deducted for supper, toilet, breakfast, and the journey to the place of business, it is evident that the hours for sleep cannot exceed six, or at most seven. These young men are, no doubt, encouraged by the silly adage quoted above. There is a disposition in town youth to overdo outdoor exercise; the cycling club "night spins" are instances in point. As Nordau has said, with a great deal of truth, the town-dweller of these last decades of the nineteenth century suffers from nervous fatigue, and is so ill-advised as to make his very recreations sources, not of recuperation, but of increased exhaustion. If our forefathers were early-risers, they went also early to bed. It would be well for the rising generation if it paid more heed to the part of the proverb.—*British Medical Journal*.

JAPANESE TEA.—According to a contemporary syndicate of Japanese tea-planters has recently sent a representative to Russia to endeavour to establish markets there for the Japanese leaf. It is stated the contracts have already been made with several firms in Odessa for trial shipments, and efforts are now being made to extend the trade in Japanese tea to the French and English markets. If the Russians, who are credited with always buying the finest China tea, take to the Japanese article, there is little doubt that other nations will follow.—*Financial News*.

OZONE AS A THERAPEUTICAL AGENT.—The institution for medical treatment by ozone has been in operation since 1891 at St. Raphael, France. Here two halls are fitted up for administering the ozone in varying degrees of dilution. The inhalation hall has ozonisers of large discharge, with ten mouths or vents, each mouth consisting of a small tube leading in the ozonised oxygen, and around it a larger tube supplying pure air. The patients simply stand or sit in any portion of this room, the entire atmosphere being strongly ozonised in a few minutes. The absorption hall, designed for giving somewhat stronger doses of the gas that may be graduated at will, is provided with twenty-four mouths, from which patients inhale the mixture of ozone and air through mouthpieces. The ozonisers are of two styles, one consisting essentially of a series of sheets of tin between glass plates, and the other of two concentric glass tubes, the inner stuffed with tinned paper, and the outer covered with tin foil. Suitable connections being made with a battery of electric accumulators, the oxygen, pure and dry, is led from a gasometer through these ozonising elements, when it is entirely converted into ozone by the convective discharge. The results of the inhalations vary with the age of the patient and the nature of the malady. For anæmia and chloro-anæmia the ozone is a certain specific, while in nascent tuberculosis the benefit is in overcoming predisposition, and not in healing lesions already produced.—*Lancet*.

Notes and Queries.

INKS FOR TYPE-WRITERS.

[814.] An ink that is said, by the *Neueste Erfindungen und Erfahrungen* to answer equally well on pads or ribbons is made by mixing castor oil, 2 parts; creosote or carbolic acid, 1 part; oil of cassia, 1 part; oil-soluble aniline colour, 1 to 2 parts. There ought to be no difficulty about saturating a pad with it. Another German paper, quoted by the *National Druggist*, gives the following formula:—Dissolve soap, 30 parts, in glycerin, 125 parts; add alcohol, 720 parts, and water, 360 parts. Finally, dissolve in the mixture sufficient aniline dye to give the desired colour. If the ink should be too penetrating add more soap, and if not sufficiently so add less. The *Scientific American* states that a good ribbon-ink may be prepared by adding as much lampblack to melted soft paraffin as it will take up without becoming granular, and, after cooling, making of the consistence of fresh oil paint by diluting with a mixture of equal parts of petroleum benzine and rectified spirit of turpentine. Apply to the ribbon by means of a soft brush, and afterwards rub well in with a tooth-brush. A black aniline ink may be prepared by dissolving aniline black, $\frac{1}{2}$ oz., in alcohol, 15 oz., and adding glycerin, 15 oz.

TO COOL SUPPOSITORIES.

[815.] The use of ice for cooling suppositories in warm weather is avoided by J. H. Elson (*Meyer Bros. Druggist*), who obtains the required reduction in temperature by dissolving ammonium nitrate in water. The mould having been immersed in water almost to the top, the addition and solution of 2 oz. of the salt is said to reduce the temperature to about 30°F., if not more than 14 oz. of water be used. After pouring the melted suppository mass into the mould, add 2 oz. more of ammonium nitrate to the water, and in twenty minutes' time the suppositories can be removed. The ammonium nitrate may be recovered by evaporation and used again for the same purpose.

AMMONIUM THIO-ACETATE.

[816.] This compound is employed by Schiff and Tamgi, of the University of Pisa, as a substitute for sulphuretted hydrogen (*Scient. Amer.*). Thio-acetic acid is made from acetic acid and phosphorus pentasulphide, and dissolved in dilute ammonia solution to form the salt. About 20 to 30 minims of a 30 per cent. solution of the latter should be added to the solution to be tested, which is then to be heated to near boiling point. It is said that silver chloride, bromide, iodide, and other salts are completely converted into sulphide; mercury salts give a red precipitate of sulpho-chloride in the cold, which is converted into the black sulphide on heating; platinum and gold salts give red precipitates, also changing to the black sulphides on heating; and ferric salts are reduced to the ferrous state.

SYRUP FOR PAINFUL DENTITION.

[817.] The following preparation has been recommended by the *New York Polyclinic* for use in cases of painful dentition:—Cocaine hydrochlorate, gr. iss.; tinct. conii, 5ij.; syrup, 3ij. It should be rubbed on the gums several times daily.

ADEPS LANÆ IN OINTMENTS.

[818.] After experimenting for two years, Unna concludes that the softer adeps lanæ is preferable to anolin ointments (*Monats. für prakt. Derm.*). Amongst other formulæ he gives the following for cold cream:—Adeps lanæ, 10·0 Gm.; ol. amygd., 5·0 Gm.; aq. flor.aurant., 10·0 Gm.

Poisoning Cases and Inquests.

Strychnine.—Matilda Hannah Johnson, aged 20, died on Monday, March 11, at 134, Embden Street, Hulme, from the effects of strychnine, self-administered. Verdict: "Deceased committed suicide whilst insane."—*Manchester Evening News*.

Carbolic Acid.—Lucy Ellen Wood, the wife of an oil-merchant, died on Thursday, March 7, at Lower Tulse Hill, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst of unsound mind."—*Echo*.

Chlorodyne.—Caroline Lumley, aged 44, died at Byers Green on Friday, March 1, from the effects of an overdose of chlorodyne. Verdict: "Deceased died from an overdose of chlorodyne, but there was no evidence to show whether the dose had been taken inadvertently or intentionally."—*South Durham Mercury*.

Laudanum.—Elizabeth Leyland, an elderly widow lady, was found dead in bed on Wednesday, March 13, in New Street, Crewe. She had been taking laudanum to induce sleep and had apparently taken an overdose.—*Manchester Courier*.

Corrosive Sublimata.—Middleton Brown, aged 64, died on Sunday, March 10, at Cleobury Mortimer, from the effects of corrosive sublimate, self-administered. Verdict: "Deceased died from the effects of poison, self-administered."—*Birmingham Daily Post*.

Carbolic Acid.—Thomas Connor, aged 45, died on Wednesday, March 13, at 22, Newsham Street, Liverpool, from the effects of carbolic acid, self-administered. Verdict: "Suicide whilst temporarily insane."—*Liverpool Post*.

Carbolic Acid.—Elizabeth Flucker, aged 42, died at 56, Kenton Street, Bloomsbury, on Wednesday, March 13, from the effects of carbolic acid, self-administered. Verdict: "Suicide while in a state of despair."—*Standard*.

Laudanum.—Thomas Wilson Dudley, aged 34, an insurance agent, of Kennington Park Road, died in a coffee house in York Road, Lambeth, on Monday, March 11, from the effects of laudanum, self-administered. The coroner commented on the fact that it was quite possible to buy a pint of laudanum if a chemist chose to supply it, and pointed out that the only restriction was that the bottle should be labelled "Poison." Verdict: "Suicide while temporarily insane."—*Morning Advertiser*.

Laudanum.—Richard Philp, aged 43, dispenser at the Provident Dispensary, Leamington, died at Leamington, on Friday, March 15, from the effects of an overdose of laudanum. Verdict: "Death from misadventure."—*Birmingham Daily Post*.

Publications Received.

VULCANITE WORK. By HARRY ROSE, L.D.S. Pp. 63. Illustrated. Price 2s. 6d. London: J. P. Segg and Co., Regent Street, W. From the Publishers.

A STUDENTS' TEXT-BOOK OF BOTANY. By SYDNEY H. VINES, M.A., D.Sc., F.R.S. Second Half. Pp. 390. Price 7s. 6d. London: Swan, Sonnenschein and Co. From the Publishers.

REPORT OF THE PORT OF LONDON SANITARY COMMITTEE, WITH THE HALF-YEARLY REPORT OF THE MEDICAL OFFICER OF HEALTH FOR THE PORT OF LONDON TO DECEMBER 31, 1894. Pp. 50. From the Committee.

Trade Marks Applied For.*

- 183,882.—LYNN'S FIG REMEDY, and clusters of fruits and wording on a label. A medicine for human use.—J. H. Lynn and Co., 11 and 13, St. Bride Street, London, E.C. November 26, 1894. The essential particulars are the devices of the clusters of fruits and the fac-simile of the applicants' signature.
- 184,984.—ARCHER'S WOUND LOTION and fac-simile of applicant's signature. A medicated lotion for the cure of wounds, for human use.—Archer and Co., 7, Lovaine Terrace, Newcastle-on-Tyne. January 16, 1895. The essential particular is the signature.
- 185,202.—FORBLOOMER and other wording on a label. A patent medicine for human use.—Astley Cooper, Oakland Chemical Works, Meadow Road, Leeds. January 29, 1895. The essential particular is the word 'Forbloomer.'
- 185,214.—AROSCOPIC.—Spectacles and eyeglasses.—Leon Kokocinski, 1, Great Ormond Street, London, W.C. January 29, 1895.
- 188,048.—VARILAT.—Elastic stockings and leggings (not medicated), for the treatment of varicose veins.—Ebenezer Diver, Yately House, Kenley, Surrey. October 19, 1894.
- 184,694.—DEVICE—A JUG IN A BASIN.—Perfumery (including toilet articles, preparations for the teeth and hair, and perfumed soap).—Emil Danziger, 167, Piccadilly, London, W. January 5, 1895.
- 184,780.—CAMEO.—Perfumery (including toilet articles, preparations for the teeth and hair, and perfumed soap).—Wm. Topley and Sons, Limited, 8 and 10, New Road, Woolwich, London. January 10, 1895.
- 185,048.—CUTEXINE and fac-simile signature of the applicants.—Perfumery.—Fryer and Co., 1, Pier Terrace, Lowestoft. January 22, 1895. The essential particular is the fac-simile signature.
- No. 184,887.—CARLA.—A medicated lotion for chapped hands.—Emily Horton, 186, Gloucester Road, Bishopston, Bristol. January 15, 1895.
- No. 183,798.—DEVICE—A FOWL.—Linseed oil for use in manufactures.—Frederick Friend, 11, King William Street, London. November 21, 1894.
- No. 184,851.—KOPONAX.—Perfumery, and a preparation for the hair.—Francis Samuel Collyer, 10, Smithford Street, Coventry, Warwickshire. January 14, 1895.
- No. 185,171.—PARADISE-BIRD BRAND.—Device.—A bird of paradise on a branch.—Perfumery, including toilet articles, preparations for the teeth and hair, but not including perfumed soap, and not including any goods of a like kind to perfumed soap.—Thomas Pink, Staple Street, Long Lane, Borough, London. January 26, 1895.
- No. 184,752.—WORTHALL and device of a nurse, and parts of a table and a bed.—A sterilising, disinfecting, and deodorising fluid.—Charles Thomas Gardner 10, Sussex Road, Worthing, Sussex. January 9, 1895. The essential particular is the device.
- No. 184,643.—ZITKA.—Medicine for human use.—John Grey Russell, 132, The Albany, Liverpool. January 3, 1895.
- No. 185,106.—KONVO.—Chemical substances prepared for use in medicine and pharmacy.—William Mottram, 95, Fleet Street, London. January 24, 1895.
- No. 185,165.—PARADISE-BIRD BRAND.—Device.—A bird of paradise on a branch.—Chemical substances prepared for use in medicine and pharmacy.—Thomas Pink, Staple Street, Long Lane, Borough, London. January 26, 1895.
- No. 184,285.—PAZO.—Sanitary pads or towels (not medicated) for women, and belts specially prepared for supporting the said pads or towels.—Robert Darton Gibbs, 3, Duchess Road, Birmingham. December 14, 1894.
- No. 184,072.—KOZEL.—Tooth paste and other preparations for the teeth.—Gavin Martin, 71, Manningham Lane, Bradford, Yorkshire. December 4, 1894.
- 185,150.—DEVICE—THE CARD, KING OF SPADES.—Perfumery (including toilet articles, preparations for the teeth and hair, and perfumed soap).—Hodgson and Simpson, Calder Soap Works, Wakefield, Yorkshire. January 25, 1895.

* Compiled from the *Trade Marks Journal*.

No. 185,332.—DEVICE—A CHERUB DRIVING A BUTTERFLY.—Perfumery (including toilet articles, preparations for the teeth and hair, and perfumed soap).—Blondens & Cie, Malden Works, Malden Crescent and Ryland Road, London, N.W. February 6, 1895.

Patent Office Business.

APPLICATIONS FOR PATENTS.*

Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 4588.—An apparatus for stereoscopic photography with one lens. March 4, 1895.
- No. 4560.—A new or improved compound for the cure of toothache.* March 4, 1895.
- No. 4583.—Non-fillable bottles.* March 4, 1895.
- No. 4585.—Improvements in photographic developing dishes. March 4, 1895.
- No. 4620.—Improvements in openers and shields to internally stoppered bottles. March 5, 1895.
- No. 4688.—An improved photographic camera. March 1895.
- No. 4684.—Improvements in wooden vessels for the transportation of acids and other corrosive liquids. March 1895.
- No. 4742.—Improvements for securing hermetically to stoppers or corks to jars, bottles, and other vessels. March 6, 1895.
- No. 4818.—Improvements in plates used for photographic purposes. March 7, 1895.
- No. 4821.—A new or improved washing rack for sensitive photographic films. March 7, 1895.
- No. 4801.—A new or improved bottle stopper.* March 1895.
- No. 4945.—Improvement in bottles for gums and such like or other fluids. March 8, 1895.
- No. 4986.—Apparatus for raising liquids by air pressure. March 8, 1895.
- No. 4997.—A needle plumb indicator for photographic cameras and similar purposes. March 8, 1895.

PATENTS PUBLISHED DURING MARCH.

White Lead (Matthews, R.).—Comprises an improvement in Patent No. 20,891 of 1892, granted to Matthews and Noad, and refers to the manufacture of white lead treating litharge or other lead oxide with a mixture of acetic acid and glycerin. The proportions used and the exact method of treatment are described in the specification, the resultant being a basic lead acetate. This is allowed to settle in a tank, and, after the supernatant liquor has been drawn off, is treated with a stream of carbonic acid gas. A basic carbonate suitable for use as pigment is thus produced. It is passed through a filter press, washed with a weak solution of ammonium or sodium carbonate, and dried. No. 7129 of 1894.

Compresses, Bandages, etc. (Snedekor, C. F.).—In cases where a hot compress, etc., is required, a series of electric conductors wrapped in asbestos, etc., are encased at intervals between two layers of fabric, which is further enclosed in a bag of Turkish towelling, etc. The heat generated by passage of electricity through the conductors the temperature being regulated by means of a rheostat by throwing certain of the conductors into or out of the circuit. No. 7535 of 1894.

Phosphorus (Shearer, A., and Clapp, R. R.).—Phosphorus is prepared by heating native or other aluminous phosphate with carbon and a chloride, such as that of potassium, sodium, or calcium, or a mixture of them, a current of dried hydrochloric acid gas. Ordinary wood charcoal, coal, or coke may be employed, and the temperature preferred is a red heat. No. 7636 of 1894.

Soap (Gross, A.).—A cleansing agent for laundry, other work is prepared by mixing petroleum ether with solution of the best soda soap, then adding vinegar essence with constant stirring, and finally mixing in fine powdered stearine. No. 18,553 of 1894.

Disinfecting and Purifying Air (Sharp, M. S.).—The invention comprises an arrangement acting on the fountain principle, by which the disinfectant or purifying

* Compiled from the *Illustrated Official Journal* (Patent Office).

automatically runs from a globular reservoir upon a porous surface as fast as it evaporates therefrom. No. 16,414 of 1894.

Pills (Tildesley, T.).—Pills for liver and other complaints are prepared from a mixture of stated proportions of wild lemon, blood root (red puccoon), turmeric, black oot (culver), saxifrage, convolvulus, "oleoresina piperis," oil of ootula, extract of dogwood or scutellaria, extract of yellow umbel or cypripedium, and extract of barberry (*Berberis vulgaris*). No. 21,589 of 1894.

Insecticide, etc., distributing (Davies, J. F.).—The insecticide, disinfectant, etc., is contained in a metal case tied with a spout at the bottom of the front side, and arising at the opposite side another tube connected with an air-injector consisting of a collapsible indiarubber ball, in compressing the ball, air with a quantity of the powder, etc., is expelled at the spout. No. 639 of 1895.

Antiseptic tissue (Neyron, L., and Cohen, A.).—A washed fabric having antiseptic and absorbent properties prepared by weaving wool, cotton, silk or other material with which has been incorporated 5 to 25 per cent. of wet fibre previously prepared by heating at 100° C. for four hours. No. 3693 of 1894.

Obstetrical forceps, etc. (Longmate, W. C.).—The forceps or other instruments are formed with detachable handles which are secured by a screw, spring-catch or other fastening. The instrument is thus readily cleaned, and is said to be superior to those with brazed handles, which crack and admit foreign matters at the joints. No. 140 of 1894.

Electrolysis of Alkaline Salts (Kellner, C.).—The apparatus ordinarily employed in the cells for electrolysis of salts, is replaced by one which allows passage of the electrolyte but minimises diffusion of the hydroxide produced by the electrolysis into the space containing the anode. The inventor prefers to use a diaphragm formed of a soap containing as its base the alkali which is being electrolysed. It may be shaped as a plate, which may be formed with a rigid skeleton, or it may form a sheet fixed between porous or perforated plates of inert material. No. 7801 of 1894.

Anthracene (Newton, H. E., communicated by the Farbenfabrik, formerly Friedrich Bayer, and Co.).—The drocarbons, naphtha, aromatic bases, or liquid sulphur oxide at present employed for washing crude anthracene, replaced by acetone and other fatty ketones. The inventor prefers to employ "raw acetone" or "acetone" which is stirred up with two-thirds its weight of the anthracene, heated to 60° C. for an hour, and cooled. The purities dissolved in the acetone are then removed by filtration, and the residual anthracene is washed with more acetone. No. 7862 of 1894.

Copper-manganese Alloys (Brook, J., and Allen, J. F.).—Ferro-manganese and copper in a finely divided condition are mixed and fused with suitable fluxes, such as lithium carbonate, borax, and common salt, the resultant alloy being said to be practically free from iron. A suitable mixture consists of 3 parts of copper, 1 part of ferro-manganese, and a flux consisting of "10 per cent. of lithium carbonate and 5 per cent. of borax and common salt." No. 8712 of 1894.

Sterilising Liquids, etc. (Laurent, P. M. F.).—The invention relates to an apparatus for sterilising wine, beer, k, etc., for condensing vapours, etc., and for heating and refrigerating purposes. It consists in causing the liquid or vapour to pass through one of two passages produced by spirally coiling thin metallic surfaces in such a way as to produce two passages separated by a single plate of metal. The heating or cooling medium passes through the second of the passages in the opposite direction to that traversed by the liquid, etc., treated, and is allowed to have, when leaving, the same temperature as the substance treated possesses when entering the apparatus. No. 9615 of 1894.

Subliming Metals, etc. (Abel, C. D., communicated by the Electricitäts-Gesellschaft Gelnhausen mit beschränkter Haftung).—Metals or other fusible materials are reduced to powder by being subjected to a powerful jet or jets of steam, compressed air, etc. The aerial issues in the form of a jet from a nozzle, at a temperature far above the fusing point, special arrangements being used to maintain the heat up to the time of use. The steam, air, etc., employed is heated by

passage through a channel between the heating appliance and the vessel containing the metal, etc., and is preferably used in the form of several jets crossing each other obliquely. No. 24,273 of 1894.

Electro-deposition of Silver, etc. (Möbius, B.).—Relates mainly to the treatment of bullion containing silver, gold and copper. The anodes formed of the bullion are arranged above and close to a cathode consisting of an endless metallic band which passes over two rollers and continuously moves in one direction towards an endless travelling belt. The electrolytic bath is so arranged that the silver deposits in a loose spongy condition on the cathode, and when it reaches the travelling belt, falls upon it and is carried into an external receiver. The anodes lie upon a canvas or other frame, which retains the gold as it falls from them. The copper remains in solution in the bath. No. 469 of 1895.

Hernia trusses (Waddell, M., and Kinnear, J.).—The arms of a double truss are hinged to a backplate and are bent downwards at the end carrying the pad, to which they are screwed or otherwise attached as usual. The pad and the backplate are preferably made of perforated aluminium. The arms are constructed of spring steel. No. 1212 of 1895.

Phenetidin-citric acids (Johnson, J. Y., communicated by Heyder-Nachfolger, F. von).—The mono- and diphenetidin-citric acid are described as "medicinal substances" of rapid action and without secondary reactions. The di-acid is a white powder, difficultly soluble in water, but more soluble in caustic soda and alcohol. It melts at 179° C. The mono-acid forms white crystals containing water of crystallisation and melting at 72° C. When crystallised from chloroform, it is anhydrous and fuses at 127° C. It is readily soluble in water, has an acid reaction, and is soluble with effervescence in a "soda solution." The sodium salt of each acid is soluble in water, but almost insoluble in alkaline solutions. The acids are prepared by heating para-amido-phenetol with citric acid in proportions dependent on which acid is required. The temperature used is 100° to 200° C., and the resultant mixture is treated with a solution of soda. The liquid is filtered and treated with hydrochloric acid, and the precipitated acid is recrystallised from chloroform or water in the case of the mono-acid, or from alcohol in the case of the di-acid. No. 1254 of 1895.

Trade Correspondence.

[Under this heading it is proposed to publish letters to the Editor, which deal more especially with the trade aspects of pharmacy. Correspondents should write on one side of the paper only, and as concisely as possible, preferably with name and address for publication.]

PREPARATION OF EXTRACT OF BEEF AT CHICAGO.

Sir,—Referring to the article which appeared in the London Times of the 4th inst., a portion of which has been reprinted in your Epitome for March 9, on the subject of Chicago packing houses, we think that whatever may have been the source of the article, the writer defeated his own object, even viewed from a public standpoint, by his own vindictiveness.

The publishers of the Times have been utterly misled by their correspondent, and although unwilling to publicly acknowledge it, they have already ascertained that no Government meat inspection is so strict as that enforced in Chicago, and it would be impossible for any packer to cut up diseased cattle for human food, as stated by the Times correspondent.

Personally, we protest strongly against such a general statement, for the reputation that we have been able to sustain for preserved meats and ox-tongues under the Armour Canning Co. brand for nearly a quarter of a century, is evidence that we supply only products of the best quality, all of which are carefully examined before being put up, and we certainly should not stoop, nor would any respectable firm, to the practices described.

Our extract of beef department is scrupulously clean and open to the public. Thousands of visitors from Great Britain have at various times visited our packing house, which is really one of the sights of Chicago, and all can corroborate our position in this matter.

59, Tooley Street, S.E.

ARMOUR AND CO.

March 14, 1895.

Obituary.

Notice has been received of the death of the following:—

On March 11, Frederick Robert Hughes, chemical manufacturer, died at his residence, The Links, Bo'ness, after a short attack of influenza. Mr. Hughes, who was 87 years of age, had a wide reputation among pharmaceutical and analytical chemists as a manufacturer of iodine and other chemicals. He was the first to succeed in extracting cyanogen from atmospheric air, a discovery which attracted no little attention at the time (1852). For many years he made continuous experiments in the extraction of iodine from kelp or burnt seaweed, and eventually succeeded in perfecting a process quite original in the manufacture of this chemical. His works at Bo'ness cover over two acres, and at one time he employed over 120 men. Mr. Hughes was a Fellow of the Astronomical Society, and was engaged for a number of years in the manufacture of telescopes. His observatory at Bo'ness contains some of the finest instruments in the kingdom. He was a Fellow of the Chemical Society, and a Fellow of the Horological Society. He took out a great many patents, and contributed many articles to scientific journals. He was also one of the Bo'ness Town Trustees for a number of years, and took an active part in local affairs. At the time of his death Mr. Hughes was the oldest man in the burgh.

On March 8, Isaac Jones, Chemist and Druggist, Walworth. (Aged 71.)

On March 12, Robert Smyth, Chemist and Druggist, Pontypridd. (Aged 65.)

On March 12, Richard Griffith, Pharmaceutical Chemist, Slough. (Aged 73.) Mr. Griffith was local secretary for Slough, and had been a member of the Pharmaceutical Society since 1846.

On March 12, E. Charles Wynter, Chemist and Druggist, Eastbourne. (Aged 35.)

On March 13, William Watts, Chemist and Druggist, Portsmouth. (Aged 71.)

On March 18, Alexander Seath, Pharmaceutical Chemist, Dunfermline. (Aged 68.) He began his apprenticeship with the late Mr. Dron, of Kirkcaldy in 1840, and about forty years ago came to Dunfermline, where he has been in business ever since, as successor to the late Mr. McARA. He became a member of the society in 1854, and has been a contributor to the Benevolent Fund for upwards of thirty years. From 1875 to 1882 he was a member of the Executive of the North British Branch, and for fifteen years he has been Local Secretary in Dunfermline. He took a warm interest in all pharmaceutical matters. He was for twenty years a member of the Dunfermline Town Council, and acted for a time as Burgh Treasurer, and afterwards as a magistrate. In politics he was a Conservative. He was an office bearer in the United Presbyterian Church, and a liberal contributor to charitable institutions. He was one of the warmest-hearted, kindest, and gentlest of men, and held in high respect among all classes. One of the old type of pharmacists, methodical, precise, absolutely trustworthy, and always at his post, and yet one who magnified his calling and looked upon it as something more than a trade, he won the confidence of the community. For several years he had been in delicate health, and died of anæmia on Monday last.

Technical Notes.

Professor Schiff and Dr. Tarugi describe, in the *Berichte*, a substitute for the disagreeable sulphurous hydrogen employed in qualitative analysis. The new reagent is the ammonium salt of thio-acetic acid, which is decomposed by hot dilute hydrochloric acid, liberating sulphuretted hydrogen without any precipitation of sulphur. When a feebly ammoniated solution of ammonium thio-acetate is added to a hydrochloric acid solution of the metals of the same group, and the liquid is heated, the metals are precipitated as sulphides. Only a very faint odor of H_2S is said to be perceptible.—*Technical World*.

An electric plough has been brought out by many by Messrs. F. Zimmerman and Co., of Rale. A chain is stretched round the field where required, and runs over a sprocket wheel on the motor. The cable is thus able to wind itself along, and drag the plough after it. The cable to the motor is carried by a number of small trolleys running over the ground. The length of cable is sufficient to reach across the field, as the motor, as it winds itself backwards and forwards, swings the cable over the ground by starting work on the side nearest the engine and working up the field away from it, the cable does not foul the plough. The trials of the plant are said to have been most satisfactory.—*Technical World*.

In testing for starch in solution, an aqueous solution of iodine may be added in considerable quantity without the characteristic blue colour being developed, but the addition of even a minute quantity of iodide of potassium immediately brings about the desired action. This has been explained by Mylius, as the iodide of starch contains as a necessary constituent, potassium or hydrogen iodide, but C. Meincke has now published the result of a large number of experiments on this moot point, which show that the formation of starch iodide is also facilitated by the presence of many other salts, notably the chlorides of barium, sodium, ammonium, and calcium; the sulphates of potassium, ammonium, and sodium, magnesium sulphate, alum, and borax, although the sensitivity of these salts in producing the reaction varies considerably.—*Public Health*.

An inexpensive photographic tray or battery which is practically water, acid, alkali proof, may be made out of a pasteboard box by covering it with a coating made by melting together equal parts of paraffin and guttapercha chips. The guttapercha should be melted first over a slow fire, the paraffin is then added, and the whole composition thoroughly mixed and brought to a very fluid condition. It is then poured into the box or box cover, which should be dry and warm. The composition should be allowed to run down the edges, so that the entire inside of the box is well proofed, the excess is poured off and the box is allowed to cool. The outside should then be well proofed in the same manner. In case any spot fails to receive the composition, some of it may be made into sticks and applied to the bare places with the aid of hot iron, which may also be used to smooth out unevenness of the surface. Some photographers place ridges in the tray to keep the plate off the bottom to facilitate in lifting it out. These ridges can be easily built up with the aid of a hot iron. The pasteboard trays are light and are not liable to be broken by a fall. Old dry plate boxes may be used for this purpose. Wooden trays may be water-proofed in the same manner and can be used for lantern slides.—*Scientific American*.

Notes.

ANALYSIS OF OILS, FATS, AND WAXES.—The work, published in German by Professor R. Benedikt, on the chemical analysis of oils, fats, waxes, and commercial products derived therefrom (*Die Analyse der Fette und Wachsarten*), and regarded as the best work on the subject, has been rendered into English by Dr. J. Lewkowitsch, who has in addition revised and enlarged the book. This English version, which occupies some 700 pages, and has just been published by Messrs. Macmillan and Co., of London and New York, is the only work in the language dealing especially with the chemical analysis of oils, fats, and waxes.

ABBREVIATED NAMES FOR CRYSTALS.—In a paper read before the Australian Association for the Advancement of Science, Professor Liversidge proposes to avoid the waste of time involved in the use of "the present sesquipedalian names" of crystals by employing abbreviations ordinarily. Thus, octahedron would be abbreviated to octron, hexahedron to hexron, pentagonal dodecahedron to pentron, dihexagonal pyramid to ditetramid, etc., effecting a total saving of 174 letters in the list of 24 names given as an example, or an average of about seven letters each.

ARGON, AN ELEMENT WITHOUT VALENCY.—In last week's *Chemical News*, Lieut.-Col. Sedgwick claims to have anticipated the existence of an element, without valency and of the atomic weight of argon, in his work on 'Force as an Entity,' published in 1890. In that work he assumed that the atoms are spherical bodies with flat places on their surface corresponding in number to their valency. Clerk-Maxwell's conception of lines of force was that of currents in an incompressible fluid, and, according to Sedgwick, by means of the flat places two atoms could be firmly united by a film of this fluid, which is assumed to possess an overpowering tendency to attach itself to matter. The form postulated, therefore, for the non-valent atom is that of a perfect sphere; since bodies which are perfectly spherical in form cannot be united by a film but roll upon each other. In an "ideal" table of elements, given in the book, an inactive element is tabulated which is said to agree exactly with argon, taking its atomic-weight as 40, and it is pointed out that though this is only stated incidentally, yet the whole argument in connection with which it is given hangs upon the existence of elements without valency, with atoms in the form of perfect spheres, and postulates the existence of such elements.

MANUFACTURE OF QUININE.—It is announced that a limited company has been formed to build a quinine manufactory in Batavia, with a capital of 1,000,000 florins, and negotiations have been entered into with a number of the more important planters for taking over their crops for a series of years.

LIQUEFACTION OF HYDROGEN.—As briefly intimated in our report of the University College Chemical and Physical Society last week (*Epit.*, p. 105), Professor Olszewski announces that he has liquefied hydrogen, its critical point, measured with a platinum resistance thermometer, being -238° C., and its boiling point at atmospheric pressure -243° . An account of the results, which are described as satisfactory, is to be published in English. In connection with the controversy between Professors Olszewski and Dewar in the *Philosophical Magazine* for March, Professor Dewar replies in some detail to allegations made by Professor Olszewski in the February number of that publication, and concludes by asserting that, with the exception of the determination of the refractive indices of liquid oxygen, their work has had nothing in common.

ANTI-DIPHTHERIC SERUM.—The *Journal de Pharmacie* announces that the Institut Pasteur now supplies anti-diphtheric serum to pharmacists, who alone have the right to supply it. It is delivered in bottles of two sizes, at 5 francs and $2\frac{1}{2}$ francs respectively, and these are to be retailed to the public at 6 francs and 3 francs each. Hospitals and indigent persons are supplied without charge. In the instructions supplied with the serum, it is directed that the bottles should be kept at a low temperature in a dark place, without removal from the cases in which they are sent out. The serum becomes inactive above 50° , and to ensure its preservation a very small quantity of camphor has been added. Used in doses of 5 C.c. it is said to secure immunity against diphtheria for four to six weeks, and its preventive power is such that the injection of a quantity equal to $1/50,000$ of the body weight of a guinea-pig will enable it to withstand the effects of a fatal dose of a virulent culture of the toxine of diphtheria.

DEGREE FOR PROFESSOR THORPE.—The University of Glasgow has resolved to confer the degree of Doctor of Laws on Professor T. E. Thorpe, D.Sc., Ph.D., F.R.S., Principal of the Inland Revenue Laboratory, Somerset House.

HELIUM AND ARGON.—M. Berthelot announced at the meeting of the Paris Academy of Sciences on Monday, that he had received a telegram from Professor Ramsay announcing that he had obtained argon from the mineral cleveite, mixed with helium, the existence of which has been only hypothetically admitted heretofore, on the strength of a line in the solar spectrum. Helium is said to be indicated in the spectrum of argon, and the discovery has been confirmed by Mr. Wm. Crookes. The line associated with helium has also been noted by some observers in the spectrum of the aurora borealis, and it is alleged that M. Berthelot conjectures that to argon may be traced the blighting harshness of the east wind. Reference to the discovery of helium was made at the meeting of the Royal Society last week, and also at the annual meeting of the Chemical Society on Wednesday by Professor Ramsay and Mr Wm. Crookes.

NOVEL PRICE LIST.—For some years E. Merck, of Darmstadt, has been asked by physicians, who wished to have an idea as to the relative cost of remedies, to indicate in his annual report the prices of the preparations mentioned in it. This he has demurred to do lest it should in any way affect his relations with pharmacists. He has now, however, adopted an ingenious plan which consists in classifying the preparations in six groups, typical representatives of which are scopolamine hydrobromate, cocaine hydrochlorate, atropine sulphate, antipyrine, quinine sulphate, and potassium iodide. All the preparations in a given group approximate somewhat in price to the type, and there are only a limited number of exceptions which occupy intermediate positions. Of course, it is obvious that such a system would not be viewed with much favour in this country, though it may prove satisfactory in Germany where medical practitioners confine themselves to prescribing.

THE FARADAY MEDAL.—The Chemical Society has conferred its Faraday medal upon Lord Rayleigh in recognition of the discovery of argon. The previous recipients of the Faraday medal have been Dumas, Cannizzaro, Wurtz, Helmholtz, and Mendeleeff. The *Electrician* points out that Lord Rayleigh's work is the more remarkable because it was carried on upon purely physical lines, and owed its success to the extreme refinement and exactitude with which he repeated the investigations of Regnault on the density of atmospheric gases. It is curious to reflect also that nothing but lack of the needful delicacy of measurement has delayed for 110 years the discovery, upon the threshold of which Cavendish stood in 1785. At the annual dinner of the Chemical Society on Wednesday last, it was stated that the discovery of argon was the outcome of twelve years' patient work by Lord Rayleigh.

PROPOSED TECHNICAL COLLEGE AT WATFORD.—For some time past a series of Gilchrist lectures has been conducted at Watford, and at the conclusion of the course on Tuesday, March 19, Professor Attfield, as Chairman of the Town Committee, explained the progress that had been made to meet the wishes of the Gilchrist Trustees with reference to the foundation of a permanent technical college at Watford. After summarising what had been done already, and explaining that both funds and organisation were requisite to carry out the scheme, Professor Attfield said that in the first place, however, it was necessary for people to decide what they intended to do with technical education when they got it. It was useless to raise the powers of students if they were to be depressed again to a dull dead level by the interference of trade unions, and absurd for the latter to attempt to restrict a workman to one kind of work, and to restrict the best workmen to the amount of work done by the worst.

IRISH SULPHUR MINES.—According to a financial paper, it is stated that a movement is on foot for re-opening the sulphur mines of Ballymurtagh, county Wicklow, which were at one time in a flourishing state.

Miscellaneous News.

[Readers are invited to send local information of pharmaceutical interest. When newspapers are sent the paragraphs to be noted should be plainly marked, whilst cuttings should be verified by the addition of source and date.]

PROFESSOR BLACK ON MEDICAL ETIQUETTE.—On March 21, Professor Campbell Black delivered the closing lecture for the session at Anderson's Medical College, Glasgow. He advised the students that as medical practitioners they would find much to disappoint them. If they summoned courage to enshrine themselves behind a brass plate they must not think that their deserts would be commensurate with the amount of gold they could rake into their coffers. If success were to be estimated by the banker's balance they had better throw physic in a better sense to the dogs. Medicine was no more an exact science than millinery. If ever it did attain to the dignity of an exact science it must be based on the "eternal verities" of Anatomy, Chemistry, and Physiology. Keeping that in view, they could in the true spirit of science lay a stone in its proper place, and be content to wait results. They could in doing so earn, as they had a perfect right to expect, a fair day's wage for a honest day's work, reaping at the same time a satisfaction higher than money could afford. In the first years of their professional existence they would doubtless come into rude conflict with what is called "medical etiquette." He thought he had received more than his fair share of kicking and injustice, and he was yet unable to define what professional etiquette might be—if it be not a tacit understanding among men born to what is called good positions and the inheritance of wealth to crush and repress, with the bitterest vindictiveness, often diabolical machinations, the legitimate aspirations of young men who may have the misfortune to be born poor and too proud to crawl. He had frequently said it before, and he defiantly said it again—there should be no code of morals or etiquette in the medical or any other profession, but the code of morals and of etiquette which regulates the conduct of all gentlemen in their relations with one another. It was humiliating to have to confess—he was thankful to say it applied men to the south of the Tweed than to the north—that a book was actually in circulation with a view to making medical practitioners gentlemen. He did not think so meanly of any of them as to believe that they would ever be found going about with a "moral ready reckoner" in their pockets.

GREENOCK PERSONATION CASE.—As briefly announced in the Supplement to last week's Journal, Sheriff-Principal Cheyne, on Thursday, March 2, issued his interlocutor in the case of Conner v. Cairns in which the pursuer sued defender for £500 damages for alleged slander, in that he had made statements to the effect that Conner had conspired with Francis Lambie to pass the first examination of the Pharmaceutical Society in his stead. The Sheriff-Subsistent gave decree of absolviter, against which decree the pursuer appealed. This appeal has been dismissed with expenses against the appellant, and in a note the Sheriff says he had the benefit of a very able and exhaustive review of the evidence from Mr Murray, on behalf of the pursuer, and had since the hearing read and re-read the evidence most carefully. With a strong desire to decide in favour of the pursuer, to whom an adverse judgment would obviously be attended with serious consequences, he regretted

to say that, after full and anxious consideration, he had found himself unable to differ from the conclusions arrived at by the Sheriff-Substitute, whose interlocutor he accordingly affirmed. A crucial circumstance in the case was the positive identification of Lambie as the person present at the examination of January, 1892, by no fewer than five witnesses, none of whom had any interest whatever in the result of the case, or any conceivable motive to say anything except what he believed to be the exact truth. No doubt three years had elapsed since the witnesses saw the man whom they professed to identify, and if there had only been one or two of them, the theory of a mistake on that ground might have been admissible; but here the Sheriff-Substitute had observed that the cumulative force of their evidence was very strong, and he could not bring himself to believe that the whole five were mistaken, more especially when he found that the proof contained what he could not but regard as pregnant corroboration of their testimony. He had formed, on a study of the proof, a decided impression that Lambie and not the pursuer sat for the examination in question.

SCALDED TO DEATH IN BOILING WAX.—The deputy city coroner for Manchester held an inquest on March 30, on the body of Thomas Wagstaffe, aged 44, nanager for a firm of manufacturing chemists. On the previous Saturday afternoon he was striding over a tank containing paraffin wax in order to turn off steam, and fell in. His screams brought the workmen, who found him lying in the boiling wax, which was a foot deep. He died in great agony at the infirmary. A verdict of "Accidental Death" was returned.

SHOULD DOCTORS DISPENSE?—A correspondent of *The Bits* remarks that pharmacy is a trade or profession which is really little understood by outsiders. A chemist's real business is dispensing the prescriptions of medical men, and a doctor's real business is tending and prescribing for the sick. A patient is really better off to pay his doctor for his advice and prescription and take it to a reliable chemist, who, on chances are 1000 to 1, will charge according to the quality of the drug supplied. There is absolutely nothing that varies so much in price as drugs. Glycerin, citrate of magnesia, salicylates, essentia ls, the majority of drugs can be bought at any price, and it stands to reason that a chemist supplying a good, sterling quality cannot charge the same, say, the stores, where the proprietor is not a chemist at all, and really does not, in many cases, understand the true manipulation of drugs any more than his errand-boy or porter, and often has no scruples as to quality.

MASON COLLEGE CHEMICAL SOCIETY.—This Society held its last meeting for the present session on Thursday, March 21, when Mr. L. W. Cox read a paper on "The Transformation of Starch by Diastase." He first gave a short sketch of the chief investigations on the subject since the beginning of the century, and then proceeded to describe in detail O'Sullivan's work on the constitution and reactions of the various dextrins. He dealt with the malto-dextrins of Herzfeld, and that of Brown and Morris, were next dealt with, together with the theory propounded by the two later investigators respecting the degradation of the starch molecule. He opposing theories of Lintner and Düll on the one hand, and of Scheilber and Mittelmeier on the other, were also laid under contribution. Experiments were performed illustrative of the distinctive properties of starch, diastase, the various dextrins, maltose, and maltotriose. A discussion followed, after which the

spectrum of argon was exhibited and compared with that of nitrogen.

PHARMACEUTICAL FOOTBALL MATCH.—Westminster College of Pharmacy v. South London School of Pharmacy. These teams met at Tooting Common, on Saturday the 23rd inst., and a well-contested game ended in a victory for the former in 1 goal to nil. This result reflects great credit on the Westminster men, as their team was rather disorganised by the absence of their captain, and having to play two substitutes.

BRIXTON AND CLAPHAM CAMERA CLUB.—The fifth annual exhibition of this club is being held this week at Brixton Hall, Acre Lane, London, S.W., and on Thursday last a lantern lecture was given by Mr. W. Lamond Howie, of the firm of Barron, Harveys, and Co. The subject was "The Scottish Alps," and the lecture was illustrated by over 100 magnificent views, photographed by the lecturer. These included the following:—The Bens of the Highland Border: Killin; glen, river, and loch scenery of Perthshire; summer ascent of Ben Lawers, summit views and cloudscapes.—Spring ascent of Ben More: A steep couloir; an overhanging snow cornice; the final ridge; frost feathers.—Summit views from Ben Lul; the Glencoe mountains, from Stob Ghabhar; figure *genre* subjects; the photographic mountain summit; the fisherman; Highland lassies; the old smuggler, etc. In Cloudland: The nimbus; local rain; a Highland shelter; scattering clouds; the cumulus; mist of the morning, etc., etc., etc. Glimpses of Skye: Waterfalls; Loch Coruisk; Blaven, Scur-na-Gilleann; rocky ridges and pinnacles; the Quiraing, etc. Mountain Sculpture: Denudation—conglomerate pillars near Fochabers; Slaty Schist; the Frost Hammer; granite cyclopean walls, Goatfell; erosion; pot holes on Clach Bhann; glaciation; striated rocks at Loch Avon, etc., etc. The Giant Grampians: An Easter ascent of Ben Nevis—summit views; Carn Dearg; the Northern Precipice; snow cornices and drapery; the Observatory under Snow; at work; the Buried Hotel; the Eastern Arête—the Braes o'Mar; highland castles; Jacobite associations; the Graves of the Clans at Culloden; Ben Mulch Dhu; snow crevasses in June; Braerlach; lost in the mist; an Arctic summer day—"The Steep Frowning Glories of dark Lochnager"; the Balmoral Forest; deer-stalking scenes; in winter's icy grip; the Great Corrie; giant icicles; summit views, etc.

SHEFFIELD MICROSCOPICAL SOCIETY.—A general meeting of this Society was held on Friday, March 22, in the Rutland Institute, before a crowded assembly of steel merchants, manufacturers, and chemists. Mr. John Newton Coombe occupied the chair. Professor Arnold, of the Sheffield Technical School, then gave his lecture on "Recent Researches in the Micro-structure of Steel" (see report of the "Sheffield Pharmaceutical and Chemical Society," at page 853 of this week's Journal). At the close, an interesting discussion took place as to the relative value of steel, etc., and a unanimous vote of thanks was accorded the lecturer.

THE VALUE OF CHEMISTS' SHOPS.—To secure eleven drug-selling shops in different parts of the Metropolis—the shops being held on leases—a joint-stock company has been formed under the title of the Lewis and Burrows' Drug Stores (Limited), with a capital of £100,000, some of it in cumulative preference shares, some in ordinary shares, and the once popular style of issuing a small number of deferred shares is adopted. The various vendors of these shops

—who are the promoters of the company—have fixed the purchase price for the lease, goodwill and stock, plant and fixtures of the several businesses at £65,000, in cash and shares. Three of the five directors, being vendors, will not act until after the completion of the purchase. Mr. J. E. Griffiths, who is set out as general manager, is also a vendor, and will have a seat on the board. The *Statist*, commenting on the above facts, remarks that it had no idea that chemists' shops, particularly in some of the localities, could have been valued up, lock, stock, and barrel, at so considerable a sum as the vendors expect to get.

THE NEW PRESIDENT OF THE QUEENSLAND PHARMACY BOARD.—According to the *Cambridge Chronicle*, the President of the Queensland Pharmacy Board for 1895, Mr. Arthur Brand Chater, is the son of the late Mr. Jabez J. Chater, of the Gonville Nurseries, Cambridge, and grandson of William Chater, the celebrated florist of Saffron Walden. Mr. Chater was born in Cambridge, and was apprenticed to Mr. Church, pharmaceutical chemist. For two years Mr. Chater was with Southall Brothers and Barclay, of Birmingham. He went to Queensland in 1886, and shortly after his arrival established the firm of Thomason, Chater and Co., manufacturing and wholesale chemists and druggists, Brisbane. Mr. Chater was elected a member of the Pharmacy Board in 1892. He has for several years been on the Council of the Pharmaceutical Society, and has held the position of Honorary Treasurer for the past two years. In the earlier days of the College of Pharmacy, Mr. Chater was one of the lecturers, and he has privately coached a large number of pupils.

INVERNESS CHEMISTS', ASSISTANTS', AND APPRENTICES' ASSOCIATION.—The annual supper of this Association took place on Thursday, March 21, at the Palace Hotel, Ness Walk, when about thirty-six gentlemen were present. The chair was occupied by Mr. W. J. Bethune. The Chairman was supported by Messrs. L. Macleod, J. Gregory, J. Don, M.A., B.Sc. Lond., R. Macleod, D. Mitchell, D. Shaw, D. Mackenzie, W. Machardy, E. Ballintyne, A. Ross, W. Scott, A. Smith, D. Gray, J. Michie, J. Dykes, G. Robson, W. Mackenzie. After the usual local toasts had been received, "The Chemists', Assistants', and Apprentices Association" was proposed by Mr. L. Macleod, D. Mitchell in reply. "The Chemists' Association," proposed by Mr. W. Machardy, replied to by Mr. L. Macleod. "The Burgh Science School," by Mr. J. Robson, replied to by Mr. J. Don, M.A., B.Sc. "The Pharmaceutical Society," proposed by Mr. Mitchell, the Chairman in reply. "The Ladies" by Mr. D. Mackenzie, replied to by Mr. J. Michie; and "Our Guests" proposed by Mr. W. Mackenzie. The musical members and friends of the Association provided an excellent programme. After the tables had been cleared, dancing was engaged in with much spirit until an early hour on Friday morning, placing the supper of 1895 among the most enjoyable gatherings held by the Association.

SELLING UNMINERALISED METHYLATED SPIRIT.—At the Mid-Lothian J.P. Court on March 26, Harry Jardine Stuart, licensed retailer of methylated spirits, Regent Arch, trading as Finlayson and Stuart, was charged, at the instance of the Inland Revenue, with having, on January 31, sold to John Jones, Inland Revenue officer, a pint of methylated spirit in which mineral naphtha had not been dissolved, contrary to the Customs and Inland Revenue Act, 1890, whereby accused was liable to a penalty of £50. Mr. Stuart pleaded guilty, and explained that the spirit had been taken by a boy from a cask used for manufacturing purposes. A fine of £5, with the option of one month's imprisonment, was imposed.

Parliamentary News.

WEIGHTS AND MEASURES.—At the meeting, on Tuesday, of the Select Committee of the House of Commons on Weights and Measures, Mr. E. L. Woolmer, of Manchester, expressed the opinion that the difficulties in the way of a conversion to the metric system in this country would not be great. In Germany 3½ years' notice was given of the change which was about to be made, and it was found that at the end of two years even the working people were quite conversant with it. Manchester merchants had to sell according to metric weights and measures, and the necessary calculations involved a staff of clerks and additional expense as well as inconvenience. In this way, and also from the fact that a buyer preferred to buy from a merchant who dealt with the same weights and measures as himself, British trade was handicapped, as foreign merchants were not slow to make use of this advantage. The necessity for a change of standard was more intense now than thirty years ago, because so many more countries had adopted the metric system, and also because of the increasing keenness of competition. Mr. A. J. Street, chief inspector of weights and measures for the City of London, said that some large wholesale dealers, especially those transacting business with foreign merchants, greatly approved of the metric system, and practically used it in their business. They received a great many of their goods invoiced on the metric system, and converted the figures into avoirdupois, according to their requirements in this country, and conversely rendered avoirdupois into the metric system when exporting. In his opinion, there were a great many wholesale houses and a number of bullion merchants who would welcome the metric system, but, on the whole, the retail trade were very much against it.

FOOD PRODUCTS ADULTERATION.—Evidence was given before Sir W. Foster's Select Committee on Tuesday, in reference to butter prosecutions and the colouring of margarine. It was also stated that the great improvement in Danish butter of late years was to be attributed to the action of the Danish Government. They had a large institution from which they sent out professors, teachers, and assistants to go through the country and instruct the farmers. They had also a representative in England, whose duty was to see that nobody attempted to sell other butter as Danish. He believed that the whole system of fraud arose from the mixing of margarine and butter, and he suggested that that should be prohibited. Mr. J. J. Thompson, another butter merchant of Manchester, spoke of margarine as a wholesome article of food.

SHOP HOURS BILL.—Sir John Gorst took the chair at a meeting on Tuesday of the Select Committee appointed to deal with this Bill, and Mr. C. A. Cooney, secretary of the Scotch Shopkeepers' and Assistants' Union of Glasgow, said that at a special meeting of the board this Bill was considered and approved as being a voluntary Bill. He found shopkeepers, as well as assistants, were in favour of closing shops at definite hour by local option, but he did not think a Bill would be complete that did not contain a provision that the assistants should cease work when the shops closed. Mr. T. W. Flint, from the same organisation, gave similar evidence. Mr. Edward Day, of Wakefield, hon. secretary of the West Yorkshire Federation of Chamber of Trade, also gave evidence.

Proceedings under the Pharmacy Act.**SALE OF FELLOWS' SYRUP BY AN UNREGISTERED PERSON.**

At the Carnarvon County Court on Wednesday, March 20, before His Honour Sir Horatio Lloyd, the Pharmaceutical Society of Great Britain sued Messrs. Evans and Lake, grocers, Carnarvon, for a penalty of £5 for selling poison contrary to the provisions of the Pharmacy Act, 1868.

Mr. R. E. L. Vaughan Williams, barrister, instructed by Messrs. Flux, Thompson and Flux, appeared for the Pharmaceutical Society; Mr. J. T. Roberts, solicitor, Carnarvon, appeared for the defendants.

Mr. Williams said he should prove that the defendants, not being registered chemists, had on January 2 last sold a bottle of Fellows' Syrup of the Hypophosphites, containing, amongst other ingredients, strychnine, which was one of the poisons enumerated in the schedule attached to the Act. Although, as a matter of fact, the wrapper of the bottle bore a label to the effect that the preparation contained strychnine, yet he submitted that it was not necessary for him to prove that the defendants knew that the article they sold was a poison. The defendants had been in correspondence with Messrs. Flux and Co., and had pressed them to disclose the name of the purchaser; but that, of course, for obvious reasons they could not see their way to do.

Mr. Roberts said that he should deny the sale, and also raise the technical objection that the letter claiming the penalty was not properly framed, in that the particulars charged them with selling the medicine, but did not state that they were not chemists.

His Honour: If you can prove that you are registered chemists and druggists there is an end of it.

Mr. Roberts: They were charged with "selling" or "keeping open shop," and he wished to know which charge the Society intended to proceed upon.

His Honour: You might do both.

Mr. Roberts contended that he ought to be definitely charged with either selling or keeping open shop, that he might conduct his defence accordingly.

His Honour: That will no doubt come out in the evidence. If, however, at the conclusion of the case you are still embarrassed I will ask the plaintiff to enlighten you.

Mr. Thomas John Hughes, chemist, of 4, Ogwen Terrace, Bethesda, stated that on January 2 last he went to Carnarvon to the shop of Messrs. Evans and Lake and purchased a bottle of Fellows' Syrup and a pennyworth of sweets. The bag of sweets produced was the one purchased by him; it bore the name of Evans and Lake, the name was also over the shop. The bottle of Fellows' Syrup was wrapped in an outer covering of tissue paper, through which he could see the label.

The descriptive label stating the syrup contained strychnine was here read by the counsel.

Mr. Hughes continued: On January 3 I wrote to the Society stating that I had made the purchase, and on February 27 Mr. Moon came to Bethesda and fetched the bottle away.

Cross-examined by Mr. Roberts, witness stated that he also sold Fellows' Syrup at his own shop, and on being asked who sold him the article at Evans and Lake's he pointed out a young man named Garner, who was in court. The Fellows' Syrup was not publicly exhibited in the shop, and whilst the assistant was absent in the back part of the shop obtaining it, witness bought the bag of sweets of another assistant.

Mr. Harry Moon, Clerk to the Registrar of the Pharmaceutical Society, stated that on January 4 he received a letter from the last witness, and on February 27 he went to Bethesda and brought away the purchase. Witness subsequently handed the bottle over to Mr. Eastes for the purpose of analysis.

Cross-examined: Witness said that Mr. Hughes had not been instructed by the Pharmaceutical Society to visit the defendant's shop.

Mr. Ernest John Eastes, F.I.C., Demonstrator of Practical Chemistry in the Laboratory of the Pharmaceutical Society, gave evidence that he had received the bottle from the last witness, and had analysed its contents. He found it to contain strychnine in the proportion of 1/8th grain to the fluid ounce, amounting to nearly one grain in the whole bottle.

The Register of Chemists and Druggists, in which defendant's name does not appear, was put into Court, which closed the case for the plaintiff.

Mr. J. T. Roberts wished to know what was charged against his clients; whether "selling" or "keeping open shop."

His Honour: If a person sells he keeps an open shop for selling in a case of this kind.

Mr. Roberts said he ought to know what he really had to answer. In the Wheeldon case, heard in the High Court, the unqualified assistant of a chemist was held liable for the sale of a vermin killer containing strychnine. He maintained that, under section 15 of the Act, the person who actually sold was liable, and he alone; and on the strength of that decision the assistant who sold the bottle in the present case ought to have been summoned, and not Messrs. Evans and Lake.

Mr. Vaughan Williams: All that this comes to is that the assistant as well as the master is liable.

His Honour: Of course every seller is responsible, but the master cannot slip out of it because the man whom he employs has committed the actual act.

Mr. Roberts: The plaintiffs refused to give us the name of the alleged purchaser, so we were unable to trace the sale; could we have done so we should have paid the penalty. When his clients found that they were not entitled to sell any medicine such as Fellows' Syrup on account of it containing poison they at once withdrew such article from sale.

William Garner, assistant to Messrs. Evans and Lake, said that he had never sold Fellows' Syrup to Mr. Hughes or anyone else. He had not been forbidden to sell it by his employers.

Cross-examined: He was not employed in the medicine department, but if he were asked for a patent medicine by a customer he would go into the other department and fetch it. He had never heard of Fellows' Syrup until these proceedings were instituted.

William George Hughes, assistant in the patent medicine department at Evans and Lake's, said he had not sold Fellows' Syrup to Mr. Hughes. He had not sold it at all during the last six months. His employers had given orders to withdraw the article from sale, and it had consequently been removed from the fixtures.

Cross-examined: When he received the orders not to sell, the article was taken out of the shop, but he did not know to what place it was removed.

Mr. Lake, junior partner in the firm of Evans and Lake, said they used to sell large quantities of Fellows' Syrup. When they found from time to time that articles they were selling were in the list of poisons they withdrew them from sale. Fellows' Syrup was withdrawn more than a year ago.

Cross-examined: I do not know about poisons myself, but we know when a medicine contains a poison and must be withdrawn from sale by seeing an account of the conviction in the newspapers. When he removed the bottles from the shop he locked them

up in his office. They also had a business at Bangor and had given instructions that Fellows' Syrup should not be sold there. The instructions might have been given after they had been charged with the offence.

Mr. Vaughan Williams then addressed the Court, and in the course of his remarks alluded to a letter from the defendants promising to give an undertaking not to offend in the future if these proceedings were abandoned. He said that the Pharmaceutical Society could not agree to this course, or the result would be to make the Act almost a dead letter. The effect of a successful prosecution was very valuable in deterring others from offending, as might be well seen from Mr. Lake's own evidence. With reference to the technical objection as to the terms in which the offence was described, he maintained that sale by agent was equivalent to keeping open shop, and in support of that statement he referred the Judge to the decision of the High Court in the case of *Pharmaceutical Society v. Hornsey*.

His Honour said he should carefully read the decision in that case and also in the Wheeldon case, and meanwhile reserved judgment.

Publications Received.

A HANDBOOK OF SYSTEMATIC BOTANY. By Dr. E. WARMING, with a Revision of the Fungi, by Dr. E. KNOBLAUCH. Translated and edited by M. C. POTTER, M.A., F.L.S. Pp. 620, with 610 illustrations. Price 15s. London: Swan Sonnenschein and Co. From the Publishers.

KING'S COLLEGE HOSPITAL REPORT FOR 1893-4. Edited by NESTOR TREARD, M.D., F.R.C.P., W. WATSON CHEYNE, F.R.C.S., F.R.S., JOHN PHILLIPS, M.A., M.D., F.R.C.S., and W. D. HALLIBURTON, M.D., F.R.S. Pp. 402. Price, 7s. 6d. London: Adlard and Son, 1895. From the publishers.

CHEMICAL ANALYSIS OF OILS, FATS, WAXES, AND OF THE COMMERCIAL PRODUCTS DERIVED THEREFROM. From the German of PROFESSOR D. R. BENEDIKT. Revised and enlarged by Dr. J. LEWKOWITSCH, F.I.C., F.C.S. Pp. 683. Price, 21s. net. (Macmillan and Co., London and New York.) From the publishers.

Personal and Trade Notes.

Mr. J. Harris Burns, who gained the last Edinburgh Chemists', Assistants', and Apprentices' Association Prize, admitting him to Dr. Stevenson Macadam's chemistry lectures at Surgeon's Hall, has been awarded the Silver Medal. He has just completed his apprenticeship with Messrs. H. C. Baldon and Son, 78, Princes Street.

Mr. Henry Dunn, Pharmaceutical Chemist, Local Secretary for Shipley, has been re-elected as the representative of Shipley on the West Riding County Council. At the first meeting of the new Council, held March 18, Mr. Dunn was elected to the position of Alderman. He is also Vice-Chairman of the Shipley Urban District Council.

Alfred John Gower, and John Thomas Emerson, chemists and druggists of Halstead, Essex. The business will be carried on by J. T. Emerson.

Alfred Cox, and John Henry Montague, carrying on business as surgical instrument makers, at 108, New Bond Street, London, W., under the style of C. Wright and Co.

Thomas Beecham and Joseph Beecham, carrying on business as manufacturers and vendors of proprietary articles known as Beecham's Pills, Beecham's Tooth Paste, etc., at St. Helen's, Lancashire, under the name of Thomas Beecham. The business will be continued by Joseph Beecham under the same style and name.

Notes and Queries.

TO FLAVOUR COD LIVER OIL.

[821.] Oil of eucalyptus, 1 p.c., is added to cod liver oil by Duquesnel (*Jour. de Pharm.*), and is said to hide its odour and taste. A more elaborate process is recommended by Paresi (*Presse Médicale*), who mixes cod liver oil, 400 Gm., freshly roasted and ground coffee, 20 Gm., and animal black in powder 10 Gm., in a stoppered vessel, and warms it on a water bath at a temperature of 60° for a quarter of an hour. The mixture is then left for two or three days, except that it is shaken from time to time, and, finally, filtered through paper. The product is described as amber-coloured, and as having a distinct odour and taste of coffee.

THYROID PILLS.

[822.] Dried and powdered thyroid gland may be made into pills by the following formula (*Merck's Bericht*), the quantities sufficing for thirty pills:—Dried thyroid gland, 32 grs.; kaolin, 32 grs.; vanillin, 1/8 gr.; tragacanth mucilage, q.s. The pills should be coated, and two to five may be administered daily.

PRESERVATION OF SYRUPS.

[819.] Having been struck by the keeping properties of syrup of tolu under the most disadvantageous conditions, Cesaris (*Boll. Chim. Farm.*, 1891-2), attributes its stability to the presence of benzoic acid, and recommends the addition of 1 per cent. of that acid to syrups prone to ferment.

GARGLES FOR FETID BREATH.

[820.] The following formula is given in the *Annales de Pharmacie*:—Saccharin, 1 Gm.; sodium bicarbonate, 1 Gm.; salicylic acid, 4 Gm.; alcohol, 200 Gm. Dissolve and add a few drops of the solution to a glass of water. Other suggested remedies, all to be used as gargles, are a weak solution of potassium permanganate; an infusion of sage leaves; or a decoction of camomile leaves, with 5 p.c. of chlorine water, 10 p.c. of glycerin, and a few drops of tincture of myrrh or lavender added.

DISPENSING PHOSPHOGLYCERATES.

[823.] Phosphoglycerates, according to Merck (*Bericht*), decompose in contact with carbonates, phosphates, and lead salts. The free acid decomposes on heating also, though the salts do not. Heat precipitates the lime salt from its aqueous solution on heating, but it is re-dissolved on cooling. If solutions are to be preserved any length of time they must be sterilised, as they form a very favourable nutritive medium for bacteria.

SYRUPS OF PHOSPHOGLYCERATES.

[824.] Numerous formulæ for preparations of phosphoglycerates are being published, and syrups seem to be most favoured, whilst the calcium salt is in chief demand. A formula in the *Journal de Pharmacie* is as follows:—Calcium phosphoglycerate, 10 Gm.; citric acid, 1 Gm.; sugar 600 Gm.; water, 340 Gm. Dissolve the salt and acid in the water, add the sugar, and heat until dissolved, then make the product up to 1000 Gm. with syrup of orange. Another formula is given by Merck (*Bericht*):—Rp. Calcii glyc.-phos., 3ss.; aq. dest., ʒiij; aq. menth. pip., ʒi; syr. simpl., ʒi. Sig.—ʒss. three or four times daily. As a pill mass, take of calcii glyc.-phos., gra. 48; terræ siliceæ, gra. 4; syr. althææ, q.s. M. ut. f. pilule xxx. Silver. Sig.—One pill three times a day. For a syrup containing iron, take of ferri glyc.-phos., 3ss.; aq. dest., ʒi. ʒii; syr. simpl., ʒv. ʒii. Sig.—ʒss. in a glass of water.

Poisoning Cases and Inquests.

Chlorodyne.—Aia Emily Oliver, aged 25, died on Sunday, March 17, at 4, Carlyle Road, Brentford, from the effects of chlorodyne, self-administered. Verdict: "Suicide whilst of unsound mind."

Poisonous Liniment.—Joseph Yates, aged 64, died at 68, Liverpool Road, Patricroft, on Thursday, March 21, from the effects of a poisonous liniment, taken in mistake for his medicine, both obtained from the Medical Association at Patricroft. Verdict: "Death from misadventure," and a resolution was passed to the effect that the Medical Association be desired to discontinue the use of any bottles containing liniments or other poisonous ingredients except such as by their shape, colour, or other means give warning of their contents.

Arsenic.—John Burns, aged 52, died on Saturday, March 16, at 126, Pritchett Street, Birmingham, from the effects of arsenic, self-administered. Verdict: "Deceased took the poison in an unsound state of mind." A rider to the verdict called attention to the fact that the arsenic was supplied without the signature of the purchaser.

Prussic Acid.—Edward Alfred Woolley, aged 47, died on Saturday, March 23, at the First Avenue Hotel, London, from the effects of prussic acid, self-administered. Verdict: "Suicide whilst of unsound mind."

Prussic Acid.—Dr. John Mackie, aged about 55, died at his residence in Brechin, on Sunday, March 24, from supposed prussic acid poisoning.

Trade Correspondence.

[Under this heading the Editor proposes to publish letters dealing more especially with the trade aspects of pharmacy. Correspondents should write on one side of the paper only, and as concisely as possible, preferably with name and address for publication.]

MINIMUM CUTTING PRICES.

Sir,—The increasing publicity given to new tariffs of retail charges by certain proprietors of extensively advertised goods, under the somewhat unhappy designation of minimum cutting prices, marks the advance of a movement which is of considerable importance to retail chemists and druggists.

It will perhaps be conceded that the firms who have taken so much trouble to arrive at what they consider to be practicable schemes for the prevention of "ruinous competition" are desirous, for various reasons, of attaining a base of action which shall be beneficial to the ordinary retailer as well as to themselves, hence the enforcement of signed agreements by which the subscribers are pledged not to sell certain articles below certain specified prices, but at the same time are allowed free action to charge the full advertised retail price, or as near that mark as may be deemed expedient. It appears to me, however, to be inevitable that sooner or later the so-called minimum cutting price will be well understood by the consumer, and will be held to be the proper retail price for articles sold under such arrangements.

Already I notice that one firm at least is extensively advertising a popular line of their goods in the magazines and daily papers at the minimum price, which sufficiently illustrates the truth of my contention.

Upon the margin of profit which is allowed by one firm or another, or, as to whether the goods are worth selling at the new rates, etc., I would prefer not to enter, but the principle involved and its practical bearing upon the work of the retail chemist and druggist is worthy of consideration, because it so happens that he is a factor in the

arrangement by which the goods in question are distributed to the public. It appears to me obvious that a general extension of the new system will only tend to exaggerate the friction which exists between the chemist and his customers in dealing with proprietary goods, until the adjustment between the retail price advertised and the retail price fixed by its producer as a minimum becomes absolute. It has hitherto been the custom of proprietors of well-known specialties to assess the value of their articles and affix a retail price; that price being usually a necessary part of any advertisement calling attention to the articles. In cases where the proprietors have been retailers of their nostrums as well as manufacturers and wholesalers, the prices specified upon the labels have been adhered to by them. When, however, they advertise the article at the same retail price as before, and simultaneously agree to a schedule of prices other than those which they have all along considered to be equitable, it then becomes very difficult for the retailer to show any sufficient reason why the original price should be upheld. Consumers will gradually become cognisant of the arrangement, and argue that retailers are bound to accept the minimum rates as consenting parties to the agreement. The position of the retailer, under those conditions, compares unfavourably with that of purchasing goods without conditions as to their sale, and in my judgment it is less easy to defend. By promoting such schemes, proprietors will damage their own interests.

The mere signing of an agreement not to sell goods below certain rates will, I fear, do nothing towards the attainment of uniformity so long as there is an adherence to the custom of advertising a retail price which there is no endeavour, nor apparently desire, to conserve.

Kilburn, N. W.

CHARLES B. ALLEN.

Obituary.

Notice has been received of the death of the following:—

On February 24, Gilbert H. N. Allott, Chemist and Druggist, formerly of Maidstone. (Aged 33.) Mr. Allott died at Jubbulpore, Central India, and he was a representative of Messrs. Horner and Sons, wholesale druggists, London.

On March 16, Edward Grant, Chemist and Druggist, Exeter. (Aged 75.)

On March 16, Richard T. C. Fuller, Chemist and Druggist, Willesden. (Aged 50.)

On March 19, James Thyer, Chemist and Druggist, Hull. (Aged 52.)

On March 19, Arthur Theodore Watson, Chemist's Assistant, Sheffield. (Aged 22.) Mr. Watson died under painfully sudden circumstances. He was a student at the Sheffield School of Pharmacy, and had started for a walk with about a score of other students. When in the wood at Handsworth he threw up his arms and fell to the ground. Dr. Mason, of Handsworth, on reaching the wood, pronounced life extinct. We understand that the deceased had entered for the Minor examination to be held in April next.

On March 20, G. W. Sargent, Chemist and Druggist, Kensington, W. Mr. Sargent will be remembered for the notoriety he acquired as a writer of objectionable letters, and as the defendant in an action in which Mr. Bottle, of Dover, sued him for libel. He was found unconscious behind his shop counter on Tuesday, March 19, and removed to St. George's Hospital, where he died next day.

On March 20, William Canning, Chemist and Druggist, Birmingham. (Aged 83.)

On March 20, Walter J. Pridgeon, Chemist and Druggist, Hawkhurst. (Aged 57.)

On March 21, Phillips Spencer, Chemist and Druggist, The Terrace, Roker. (Aged 87.) Mr. Spencer for a great number of years carried on a wholesale business in Low Friar Street, Newcastle-on-Tyne, but a short time ago he retired from the concern in favour of his manager, Mr. Dakers.

Patent Office Business.

APPLICATIONS FOR PATENTS.*

Where complete Specification accompanies Application, an asterisk is suffixed.

- No. 5102.—Improvements in electric arc lamps for optical lanterns, projectors, and the like. March 11, 1895.
 No. 5144.—An improvement connected with machines for filling screw-stoppered bottles. March 12, 1895.
 No. 5164.—Improvements in and in connection with corks and other bottle-stoppers and the like. March 12, 1895.
 No. 5197.—Apparatus for deodorising fats and oils.* March 12, 1895.
 No. 5230.—Improvements in label holders.* March 12, 1895.
 No. 5250.—An improved method of producing photo-chromic pictures. March 12, 1895.
 No. 5303.—An improvement connected with photographic cameras.* March 12, 1895.
 No. 5346.—Improved photographic camera. March 12, 1895.
 No. 5370.—Improved photographic stereoscope. March 14, 1895.
 No. 5462.—An improved label. March 15, 1895.
 No. 5493.—Apparatus for retailing measured quantities of liquids.* March 15, 1895.
 No. 5558.—Improvements in photographic cameras. March 16, 1895.

PATENTS PUBLISHED DURING MARCH.

Precipitating gold, etc., from solution (MacArthur, J. S.).—The invention relates to the precipitation of gold and other precious metals from solution in potassium cyanide, by means of zinc. The presence of copper in the solution is found to render the precipitating action of the zinc slow, but the inventor claims that if the zinc be coated with spongy lead by immersion for about a minute in a solution containing about 1 per cent. of lead, this retardation does not occur. Finely divided lead or lead shot may also be employed, especially when mercury is present, but any other agent such as tin, iron, or carbon which is negative to zinc and induces an electric action may be used. No. 8184 of 1894.

Electro-medical apparatus (Clerke, A. B. H.).—The apparatus consists of two face-plates fixed on a wooden back-piece and covered with a textile material. Through the covering pass a number of studs, those of each face being connected together by wires, and having connection with wires passing to a source of electricity. When the appliance is fitted to the body the electricity passes from one set of studs through the body to the other, and the arrangements are such that it may be moved from place to place or rubbed upon the body while the current is passing. No. 8238 of 1894.

Vessels for chemicals, etc. (Apps, A.).—The vessel or case has in the cover or elsewhere an indiarubber or other membrane which permits the contents to expand without leakage, although the vessel be full. No. 8392 of 1894.

Pill bottles (Thompson, W. P., communicated by Lamprecht, H.).—The neck of the bottle and the hollow stopper, which is open at the top, are so shaped that, by inclining the bottle and turning the stopper, the pills pass singly through an opening near the bottom of the stopper into the interior of the same, from which they may be dropped out. The stopper may have a removable cap, and may then be used for retaining a number of pills. No. 8190 of 1894.

Artificial legs (Honsuckle, W. R.).—The joints connecting the toes to the foot and the foot to the leg are so arranged by means of hinges, sockets, and indiarubber and other springs, that a life-like spring is given to those parts in walking. No. 15,009 of 1894.

Distillation (Perrier, O.).—The invention relates to means for distilling, fractionating, and condensing resins, acetic and other fatty acids, alcoholic liquors, etc. The still consists of one or more horizontal or inclined cylinders divided along their length into compartments of graduated height so that the liquid passes gradually from one to the other and finally escapes. The liquid is kept in motion by

palettes, and the heating arrangements are such that the liquid is exposed to a gradually increasing temperature until the residuum escapes. As regards the condenser, the vapours pass through an "analyser" made in a number of superimposed compartments in which the various fractions of the distillate condense. The compartments are filled with beads to expose a large condensing surface, and are each covered by a passage filled with the cooling medium, whose temperature varies with the boiling point of the fraction which it is desired to condense. No. 20,175 of 1894.

Bottle-stoppers, Securing (Rekdale, J.).—For preventing the unauthorised opening of poison and other bottles in dispensaries, etc., the inventor uses a cap or cover consisting of two capsules, one of which fits over the other. On pressing down the outer capsule, claws on the other are caused to grip a flange on the neck of the bottle and cover the cork, and by means of a padlock, spring lock, etc., it may be prevented from being raised. No. 24,284 of 1894.

Reducing zinc blende, etc. (Roux, M. A. J., and Desmures, J. M. A.).—The invention relates especially to such blendes as contain silver. The finely divided blende is mixed with litharge or other lead oxide and fused in a retort or crucible. The reduced lead combines with the silver, and is drawn off from below. The residue, which contains the zinc, is mixed with blast-furnace slag or other flux and fused while air, steam, or other oxidising gas is blown through. The zinc is converted into oxide and may be skimmed from the surface. No. 1322 of 1895.

Dental appliance (Laks, H. H., communicated by Methot, L. T. E.).—The invention refers to arrangements for operating dental instruments which require to be revolved by means of an electric motor. The instrument is carried in the hand, and is revolved by an endless cord worked by a motor fixed on a bracket on the wall of the room. No. 2022 of 1895.

Bunsen burner (Seel, C.).—The burner is fitted with a vane wheel, which is rotated by the passage of the gas and which mixes the air and gas, and expels them in such a manner that a long cylindrical flame is produced. The burner is intended for ordinary use, but especially for "gas-glow lights" or incandescent gas-burners. No. 246 of 1895.

Trade Marks Applied For.*

No. 185,161.—"VOSECKER."—Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives.—Louis Sinclair, Daydawn, Nether Gardens, Hampstead, London. January 26, 1895.

No. 185,163.—"PARADISE BIRD BRAND" and device.—A bird of paradise on a bough. Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives, but not including dyes and not including any goods of a like kind to dyes.—Thomas Pink, Staple Street, Long Lane, Borough, London. January 26, 1895.

No. 185,594.—"SPIERPON."—Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives.—Spiers and Pond, Limited, 28, New Bridge Street, London, E.C. February 14, 1895.

No. 185,595.—"SPIERPON."—Chemical substances used in agricultural, horticultural, veterinary, and sanitary purposes.—Spiers and Pond, Limited, 28, New Bridge Street, London, E.C. February 14, 1895.

No. 185,871.—"AXA."—Medicine for animals.—William Henry Beach, East Castle, Bridgnorth, Salop. February 27, 1895.

No. 185,238.—"STAMA," with name and address of applicants and other wording on a label.—A patent medicine for human use.—The 'Stama Mfg. Co.,' 84, Oxford Street, London, W. January 30, 1895. The essential particular is the word 'Stama.'

No. 185,254.—"KEYSTONE" and device.—A keystone.—Chemical substances prepared for use in medicine and pharmacy.—Stephen Smith and Company, 78, Mark Lane, Bow, London, E. January 30, 1895.

* Compiled from the *Illustrated Official Journal* (Patents).

* Compiled from the *Trade Marks Journal*.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, MARCH 23, 1895.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, MARCH 21, 1895.

There have been but few changes in the Chemical Market since our last, and the amount of business done has been but small. Any alterations that have occurred have been for a fall. Citric acid continues firm but quiet at unchanged rates, whilst tartaric acid has proved in steady demand, especially the foreign brands. Oxalic acid is in fair demand, whilst with regard to ammonium compounds, no improvement has been shown in sulphate, as it has presented a very weak market throughout, and closes at a fall on last week's low rates. Carbonate of ammonia and sal ammoniac are unchanged. Ashes are steady at the previous rates, whilst borax continues a weak market, the official rates being higher than in second hand. Copper sulphate is in fair demand at unchanged rates, this also applying to cream of tartar. Mercurials are unchanged, whilst quicksilver in second hands is fractionally easier. Potash and soda compounds are all exceedingly quiet, the market in chlorate of potash especially being very weak.

ACID BORACIC.—Crystals are worth 30s., powdered, 31s.

ACID CITRIC.—Quiet, but the quotations are unchanged. It is returned at 1s. 1½d. to 1s. 2d., according to quality.

ACID OXALIC.—Supply and demand fairly balanced. It is still quoted 3½d. net, ex rails.

ACID TARTARIC.—There has been a fair amount of business done at unchanged rates, especially in the foreign brands. Quotations of English makes are still 10½d. to 11d. Foreign ditto, both powdered and crystal, 10½d.

AMMONIA SALTS.—Sulphate: Very weak market since our last, and prices have still further fallen. At the close it is returned at £11 for grey 24 per cent. Carbonate: Unaffected by the dull tone of sulphate, and is still quoted to 3½d. to 3¾. Sal ammoniac: Unchanged, first quality is still returned at 38s., seconds at 37s.

ASHES are unchanged at steady rates. Prices returned are 40s. for American, with pots at 23s.

ARSENIC.—The quotations are sully maintained at 15s. for powdered white.

BLEACHING POWDER.—A fair amount of business has been done, the quotations, 8s. 3d. to 8s. 6d., still holding.

BORAX.—The demand continues dull. Syndicate prices are still 20s. for crystals, and 21s. powdered, but second-hand holders are selling 6d. per cwt. lower.

COPPER SULPHATE.—In fair demand, without change. Quoted at £14 17s. 6d. to £15 10s., according to brand.

CREAM OF TARTAR.—Quotations are fully maintained at last week's rates, and a fair amount of business has been done. Finest French white Crystals are worth 63s. 6d., whilst the quotation for German Powder on the spot is 65s. 6d. to 66s.

MERCURIALS.—Unchanged. Quantities up to 28 lb. are still quoted at:—Calomel, 2s. 9½; Red precipitate, 3s.; white ditto, 3s.; Corrosive sublimate, 2s. 5d.

POTASH COMPOUNDS.—The market is easy all round. Prussiate Unchanged, the quotations still being 9¾d. Chlorate: The market continues very weak and little business has been passing at last week's minimum rates of 4¾d. Bichromate: Unchanged at 4¾d. to 4½d.

QUICKSILVER.—Importers' prices are still £6 10s. in second hands. It is fractionally lower at £6 8s. Saltpetre: Spot quotations for Bengal 5 per cent. are 18s. 3d., and it is steady at that rate. British refined is worth 22s. 6d. to 23s. 6d.

SODA COMPOUNDS.—Caustic Soda: 70 per cent. is worth £8 with 27 paid for 60 per cent. Crystals: Unchanged, at 38s. Bicarbonate: £7 5s. (London). Hyposulphite: Steady, at £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY MARCH 21, 1895.

The drug sales were held to-day, but few changes of interest occurred. The tone of the market was generally dull, and a large proportion of the drugs offered were bought in. Aloes were in poor supply and sold fairly well. Buchu leaves were entirely neglected. A fair amount of business was done in asafetida and ammoniacum. Benzoin was very dull. Calumba sold at extraordinarily low rates. Cardamoms were in large supply, and the majority found purchasers at good prices, some extreme quotations being obtained. Dragon's blood in reeds fetched fancy prices. Honey was not in large supply, but some good prices were obtained. Ipecacuanha was largely offered, but little changed hands, although the prices realised show a decline. Eucalyptus oil was largely offered, but all was bought in. Wax was largely offered and some good figures were obtained. During the week, crude camphor has advanced considerably, and closes very firm. A corresponding advance in the refined article is probable. Cocaine also has far advanced from 18s. 9d. to 20s. 8d., and is very steady at that rate. Caffein is firmly held and in poor supply.

ACACIA. Very quiet. In fair supply, but the majority of that offered was bought in. Out of a parcel of 28 packages of Aden gum eight casks sold at 50s. to 50s. 6d. for glassy palish lump. The remainder of this lot was bought in at 10s. to 35s. according to quality, and the parcel consisting of picked and sorts Turkey gum was all bought in; fine white picked gum at the rate of £13 10s. White Mogador gum was bought in at 50s., with Australian at 35s., three cases of good white gum sold without reserve at £6 10s., with yellowish lumpy at £4 15s. Good soft yellowish sorts sold at 70s.

ACONITE.—Fifteen bags Japan root bought in at 25s.

ALOES.—In but moderate supply. Of a parcel of twenty-five cases of Cape offered five were sold at 12s. to 18s. for ordinary drossy qualities, three more at 17s. 6d. subject. A parcel of sixty-nine kegs of Scottrine offered were all bought in.

AMMONIACUM.—In fair supply, but all bought in, the rates being 35s. to 38s. for mixed blocky and tears; and 45s. for slightly blocky.

ANISEED.—Twenty bags ex. Oriental at Bombay sold at 25s. Forty bags of Cyprus seeds were bought in at 20s.

ANNATTO.—Bought in at 2½d. to 4½d., according to quality.

ANTIMONY.—Crude Japan was bought in at £18 10s.

ANAPHTHIDA.—Largely offered to-day, the majority being bought in.

BENZOIN.—In plentiful supply, mostly bought in. Seven cases *Siamese* gum sold without reserve at 50s. to 52s. 6d. for mixed dark blocky. Eight cases *Sumatra* gum were bought in at £10 15s., after a bid of £10 had been made.

BUCU.—A moderate supply of the long variety to-day, but all was bought in.

CALUMBA.—Sold at very low rates. Eighty bags good bright washed root sold at the low price of 7s.

CARDAMOMS.—There was a plentiful supply to-day, and the majority sold at good prices, as follows: *Ceylon Mysore*, medium to bold, fine pale, 3s. 3d. to 3s. 9d.; ditto fair colour, 2s. 9d. to 3s. 3d.; medium, good pale, 2s. to 3s. 3d. *Wild Ceylon*: fine bold, 2s. 9d. to 2s. 11d.; smaller ditto and darker, 1s. 10d. to 1s. 11d.

CAFFEINE.—Remains very steady, and is firmly held. Nominally the manufacturers' prices remain as last reported, i.e., 1 cwt. lots at 15s.; 28 lb. at 15s. 6d., and smaller wholesale quantities at 16s., but it would be difficult to place an order at these rates, as there is no spot delivery.

CAMPHOR (crude).—Quotations show a marked change since our last report, a considerable advance having taken place. *Chinese* (Formosa) camphor is to-day quoted at 102s. 6d. to 105s., c.i.f. and *Japanese* at 115s., c.i.f. distant shipment.

CAMPHOR (Refined).—Consequent upon the advance in the crude material, there is a very firm tone in the market for refined camphor, and an advance is extremely probable. At present, however, the quotations remain the same as last. German and English makes in *bells* and *flowers* being returned at 1s. 5½d. for 10 cwt. lots, with squares at proportionate rates.

COCAINE.—As was last week considered probable, the manufacturers have still further advanced their prices to 20s. 3d. for *hydrochlorate*, and it is firmly held at that rate. This quotation is for 100 oz. lots, smaller wholesale quantities being returned at 20s. 6d.

COBBER.—Is steady at the unchanged rates of 12s. to 12s. 6d., second-hand holders quoting at 12s.

CASCARA.—Fifty-three bales of good bright bark were bought in at 20s., after a bid of 17s. 6d., thirteen bales sold at the rate of 18s. to 18s. 6d.

CINCHONA.—Sixteen seron Crown bark bought in bales at 11d. to 1s. 2d., with first-class, damaged, at 8d. Another parcel of twenty-three serons Crown bark sold at the rates of 5½d. to 8d., with first quality at 11½d.

COCA.—Bought in at 1s. 1d.

COLOCYNTHE.—Five barrels fair, smallish *Turkey* apple sold at 11½ to 1s. 4d.

CURBERS.—Of a parcel of 26 bags ten sold at 45s., the remainder being bought in at 50s.

OUTLEAFISH.—Bought in at 2d.

DRAGONS BLOOD.—One case fine bright fiery in reeds sold at £12 10s. Good bright lumpy was bought in at £9 10s.

HONEY.—Ten cases Jamaica were bought in at 25s., with another parcel at 26s. One cask of Australian honey sold at the same figure, and twenty cases of Californian at 41s.

IPECACUAMA.—Largely offered to-day, but met with little demand. *Rio* (Brazilian): roots sold at 4s. to 4s. 3d. for fair annulated root down to 3s. 9d. *Carthagen* (Columbia): root sold at 3s. 3d. for fair plump, first and second class damaged qualities.

JALAP.—Ten cases of fair Vera Cruz bought in at 1s. 31., that representing the limit.

FENNELSEED.—Sixteen bags sold without reserve at 24s.

KOLA.—Nuts sold to-day at 1s. 1d., with fair to medium at 1s. 6d.

MENTHOL.—Is firm at an advance of 6d. Good white crystals are now quoted at 15s. 6d. spot, whilst forward rates are 14s. 6d. to 15s., c.i.f. terms, but there is hardly any offered for delivery.

MORPHINE.—Unchanged at the nominal rate of 5s.

OILS (Essential).—*Anised*: A very firm market at advanced rates, with a tendency to go higher. It is now firmly held at 6s. 2d. on the spot. *Cassia*: Steady, at unchanged rates; quoted at 3s. 9d. to 4s., according to percentage of cinnamic aldehyde. *Peppermint*: *H. G. Hotchkiss'* brand is steady, at 9s. 9d. to 10s. *Japanese* oil containing 40 per cent. of menthol is fairly steady at 8s. 3d. to 8s. 6d. Two cases of *Ceking's* *Japan* oil were bought in at to-day's sales at 7s. *Mentholised* oil is firm at 7s. *Lemon* oil is firm, 4s. 1/2, representing a fair quotation for a brand of guaranteed purity. *Lemon-grass*: In fair demand at 1½d. to 2d. *Spearmint*: No cases of the *H. G.* oil were bought in to-day at 9s. 6d. *Blueberry*: Nothing doing at all. A fair quantity was offered to-day, the *Padlock* brand oil was bought in at 1s. 6d., and *Native* at 1s. 1d. to 1s. 6d. and *Amygdalina* oil at 1s. 4d., six cases of *Japan* oil, offered without reserve, sold at 1s. to 1s. 0½d. *Cinnamon* is mostly bought in, but five cases sold without reserve at 3½d. one case reputed genuine oil was sold at 5d. subject. *Am* was bought in at 5d. *Bergamot*: Seven cases sold without reserve at 3s. 10d., but fine essence was bought in at 3s. 1d. *Geranium*: Seven pots *R.I.* oil were bought in at 3d. to 5d. All Italian essential oils are very firm, and the prices will be steady maintained, especially oils of lemon, bergamot and orange.

OILS (FIXED) AND SPIRITS.—*Caster*: Sixty cases white *Naim* oil were bought in to-day at 3½d. *Cod-liver Oil*: The market is very weak. Best new non-congealing oil is worth about 1½ per barrel of 25 gallons, c.i.f. terms, whilst a fair quotation for prime old oil would be 160s. on the spot. Twenty-three cases of new *Norwegian* oil offered to-day were bought in at 200s., and five cases of old *Newfoundland* oil were bought in at 5s. per gallon, the limit being 4s. 6d. per gallon. *Almond*: The price has been advanced 1d. per lb., and English expressed oil is now quoted at 1s. 1d. *Linseed*: Earlier in the week a considerable fall occurred, but the tone is now steadier, and it is quoted at the close at £20 5s. *Cotton* continues fairly steady at last week's rates, and it is quoted at £16 15s. to £17 10s., according to brand. *Coco-nut*: Ceylon is quoted at £22 15s. *Cochin*, £24 15s. *Morritus*, £22 15s. *Rape* presents a very strong market. *Raffin* oil is now worth £22 5s. to £22 10s. *Turpentine*: Owing to poor demand this is considerably easier, and American spirit is now quoted at 22s. 10½d. to 23s. *Petroleum*: Very firm, at an advance. *American* oil is worth 5½d. to 5¾d., with *Rums* at 4½d. to 5d. *Petroleum Spirit*, ordinary, 7d., deodorized 7½d. to 7¾d.

OPIMUM.—A fair amount of business has been done at last week's prices. Quotations: *Turkey*, soft shipping description 12s. to 12s. 6d.; best druggists', 10s. to 10s. 6d.; seconds ditto 8s. to 9s. 6d.; *Persian* 11s. 9d. to 12s.

ORANGEPEEL.—Good bright thin cut *Maltese* peel sold at 9d.

PILOCARPINE.—Quotations are very well maintained, the scarcity continuing. *Hydrochlorate* and *nitrate* are worth 7½d. to 8s. per gramme.

QUASSIA.—Sixty bags were sold at £7 per ton.

QUININE.—Remains quiet, but the quotations are very steady maintained. *Brunswick* and *B. & S.* are quoted at 11½d. to 11¾d., with little doing at these figures.

REUBARB.—Dull of sale, although largely offered. *Swiss*: Round small to bold, 1s. 9d. to 1s. 7d.; other qualities down to 10d.

SARSAPILLA.—Jamaica sold to-day at 9d. *Lima*: Ten lbs sold at 8d. to 8½d. *Honduras* bought in at 1s. 2½d.

WAX (Japan).—Twenty-eight cases sold to-day at 25s.

WAX (Carnube).—Bought in at 26s.

WAX (Bees).—In good supply. Bleached *R.I.* wax was knocked down at £6 12s. 6d. subject. *Australian* wax: Seven cases mixed yellow, white and dark, sold at £7 10d. to £7 12s. 6d. *Jamaica* wax, £8 to £8 7s. 6d.

NUX VOMICA.—Twenty-eight bags sold at 8s.

OROTON SEED.—Bought in at 32s.

ROSE WATER.—Twelve carboys sold without reserve at 2½ per gallon.

TAMARINDS.—A parcel sold at the extraordinary price of 2½, which would hardly cover charges.

Late News.

ROYAL INSTITUTION.—The following are the lecture arrangements after Easter:—Professor George Forbes, three lectures on "Alternating and Interrupted Electric Currents"; Professor E. Ray Lankester, four lectures on "Thirty Years' Progress in Biological Science"; Professor Dewar, four lectures on "The Liquefaction of Gases"; Dr. William Huggins, three lectures on "The Instruments and Methods of Spectroscopic Astronomy" (the Tyndall Lectures); Mr. Arnold Dolmetsch, three lectures on "Music and Musical Instruments of the 16th, 17th, and 18th Centuries": 1, English; 2, French; 3, Italian." (With illustrations upon original instruments); Mr. Seymour Lucas, "Two Lectures on Picture Making"; Professor Edward Dowden, "Two Lectures on Elizabethan Literature: 1, The Pastoral; 2, The Masque." The Friday evening meetings will be resumed on April 26, when a discourse will be given by Dr. J. Hopkinson, on "The Effects of Electric Currents in Iron on its Magnetisation"; succeeding discourses will probably be given by the Earl of Rosse, Veterinary-Captain Frederick Smith, the Hon. G. N. Curzon, M.P., Professor Walter Raleigh, Mr. J. Viriamu Jones, Professor Alfred Cornu, and other gentlemen.

GREENOCK PERSONATION CASE.—At the Greenock Sheriff Court, on Thursday, the sheriff issued an interlocutor in the case of Conner v. Cairns, adhering to the judgment of the Sheriff-Substitute, with additional expenses for the defender.

NEWCASTLE-ON-TYNE PHARMACY CYCLING CLUB.—A meeting of chemists and assistants was held on Tuesday evening, 19th inst., at 55, Northumberland Street, Newcastle-on-Tyne, for the purpose of forming a cycling club. There was a representative attendance, and Mr. T. Maltby Clague occupied the chair. It was decided to call the club "The Newcastle-on-Tyne Pharmacy Cycling Club." The following office-bearers for the current year were elected:—President, Mr. John Bolam; Captain, Mr. John Shaw; Vice-Captain, Mr. Jas. Davidson; Secretary and Treasurer, Mr. A. Russell Bennet; Auditor, Mr. Geo. F. Merson; Committee, Messrs. Forbes, Maxwell, McClumpha, Sharp, and Wilson. Rules, etc., were drawn up and approved, and other preliminary business was transacted. Over a score of members were enrolled, and a vote of thanks to the Chairman terminated the meeting.

New Books and New Editions.

Publishers are invited to forward full particulars of new publications, including price.]

THE CYANIDE PROCESS FOR THE EXTRACTION OF GOLD. By M. EISSLER. (Crosby, Lockwood, and Son, Stationers' Hall Court, London, E.C.)

ONE THOUSAND PATENT FACTS. By ROBERT E. PHILLIPS, M.I.M.E. A collection of useful information relating to the protection of inventions by Letters Patent and to the registration of designs and trade marks in all countries. (Iliffe and Son, 3, St. Bride Street, London, E.C.)

TREATISE ON THE LAW RELATING TO THE VALIDITY OF CONTRACTS IN RESTRAINT OF TRADE. By W. A. JOLLY, B.A. (Effingham, Wilson, and Co., Royal Exchange, London.)

POPULAR PHENOLOGY. By W. CROSS. (Iliffe and Son, 3, St. Bride Street, London, E.C.)

CELLULOSE: AN OUTLINE OF THE CHEMISTRY OF THE STRUCTURAL ELEMENTS OF PLANTS, WITH REFERENCE TO THEIR NATURAL HISTORY AND INDUSTRIAL USES. By C. F. CROSS, E. J. BEVAN, and C. BRADLE. With 14 plates, Crown 8vo. 12s. net. (Longmans, Green and Co., London, E.C.)

PHILOSOPHY OF MIND: An Essay on the Metaphysics of Psychology. By Professor GEORGE TRUMBULL LADD, Pp. 428. Price 16s. (Longmans, Green and Co., 89, Paternoster Row, London, E.C.)

THE SCIENCE AND ART OF SURGERY. By SIR JOHN ERIC ERICHSEN, Bart., F.R.S., LL.D., etc. Tenth Edition revised by the late Marcus Beck, M.S., M.B., and Raymond Johnson, M.B., B.S. Illustrated by nearly 1000 engravings on wood, two vols., price 48s. (Longmans, Green and Co., London.)

A POPULAR TREATISE ON THE PHYSIOLOGY OF PLANTS. By Dr. PAUL SOBAUER. Translated by Professor F. E. WEISS, B.Sc., F.L.S. Pp. 266, and 33 illustrations. Price 9s. net. (Longmans, Green and Co., London.)

THE ELEMENTS OF PATHOLOGICAL HISTOLOGY. By Dr. ANTON WEICHSELBAUM. Translated by W. R. DAWSON, M.D. Pp. 472, with eight plates and a large number of illustrations in the text, some of which are coloured. Price 21s. net. (Longmans, Green and Co., London.)

ELECTRICAL ENGINEERING. By W. SLINGO and A. BROOKER. Pp. 764, with 846 illustrations, including two folding plates. Price 12s. (Longmans, Green and Co., London.)

AN INTRODUCTION TO THE PHILOSOPHY OF HERBERT SPENCER; with a Biographical Sketch. By WILLIAM HENRY HUDSON. (London: Chapman and Hall.)

THE SOURCE AND MODE OF SOLAR ENERGY THROUGHOUT THE UNIVERSE. By J. W. HEYSINGER, M.A., M.D. (Lippincott Company, Philadelphia.)

Personal and Trade Notes.

The Cerebos Salt Co., Limited, offer a reward of £10 for the most suitable motto or phrase, not exceeding ten words, to print on the reverse side of the "test circle" found in their tins of salt. Postcards, restricted to one from each person, must reach the Secretary, Cerebos Salt Works, Newcastle-on-Tyne, not later than April 9, and the result will be published in the *Daily Graphic* of April 22 and 23.

The Chemical Syndicate, Limited, has been formed, with a nominal capital of £6,000, for the purpose of acquiring a new process for manufacturing cyanide of potassium.

Messrs. Henry Marks and Sons, Ltd., sponge merchants, Houndsditch, have secured a new block of buildings adjoining their old premises, in order to cope with the demands of their increasing business.

E. Merck, of Darmstadt, and 4, Cullum Street, London E.C., is now supplying crystallised emetine hydrochloride for the quick and convenient preparation of *ipecaacuanha* wine (cf. Paul and Cownley's paper on "The Chemistry of *Ipecaacuanha*," ante, p. 692).

Messrs. Wyleys, Limited, Coventry, have forwarded a copy of their new priced catalogue of medical and pharmaceutical specialities. It now occupies 160 pages.

Messrs. Burroughs, Wellcome and Co. in their announcement referring to the death of the late Mr. S. M. Burroughs, state that the business of the firm will be continued as heretofore, and will be under the personal direction of Mr. H. J. S. Wellcome without any change in the firm's name. They have retained the services of Mr. B. Clay Sudlow, general manager; Mr. A. Searl, F.C.S., manager of the works; Mr. W. H. Kirby, chief accountant and assistant general manager; Mr. W. Lloyd Williams, F.C.S., assistant manager of the works; and the other members of the general staff. Mr. Sudlow and Mr. Kirby are, as heretofore, authorised by power of attorney to sign for the firm

New Companies Registered.*

MEAR AND GREEN, LIMITED.—Registered by A. Cox and Son, 10, St. Swithin's Lane, E.C., with a capital of £100,000 in £10 shares. Object, to acquire the business of manufacturers of and dealers in borax and boracic acid, as hitherto carried on at Kidgrove, and Tunstall, both in the county of Staffordshire, and at Connah's Quay, in the county of Flint, under the style of Mear and Green. With a view to the above, to adopt and carry into effect an agreement expressed to be made between S. Mear T. H. Green of the one part and this company of the other part, and to carry on business as refiners, distillers, and wholesale and retail manufacturers of borax and boracic acid, and as manufacturing chemists in all its branches. The first directors—to be not less than three nor more than seven—are S. Mear, T. G. Green, A. Mear, and T. S. Green. Qualification, £500. Remuneration, £1 11s. 6d. each for each board attendance; chairman, £150 per annum.

ELLISON AND MITCHELL, LIMITED.—Registered by J. Freeman, Dyson and Co., 24, Queen Street, Huddersfield, Yorkshire, with a capital of 12,000 in £10 shares. Object, to acquire the business of chemical manufacturers, as hitherto carried on at Kilnhurst, Yorkshire, by the firm of Ellison and Mitchell, and to develop and extend the same, and, with a view to such acquisition, to enter into an agreement with H. Ellison and others. The first directors—to be not less than three nor more than five—are H. Ellison, H. Ellison, junr., and G. W. Mitchell. Qualification, 10 shares. Remuneration to be fixed by the Company. Registered office: The Don Chemical Works, Kilnhurst, near Rotherham, Yorkshire.

Notices to Correspondents.

* Communications should reach the Editorial Department, 17, Bloomsbury Square, W.C., not later than the first post on Wednesday, if publication be desired in the next issue of the Journal; though prompt publication cannot always be guaranteed.

Matter intended for publication must be written in ink, on one side of the paper only, and be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

No notice can be taken of anonymous communications, and contributors are requested, as far as possible, to append their proper signatures rather than pseudonyms, a greater value being thus given to any opinions expressed.

Late Advertisements.

Assistants Wanted.

A QUALIFIED ASSISTANT required in a first-class house where several are kept. Must be a good counterman, accustomed to a high-class trade. Apply, X. Y. Z., care of Horner & Sons, Mitre Square, Aldgate, E.C.

AN active, willing Junior ASSISTANT, for brisk cash trade. Half-holiday weekly. Abstainer and non-smoker. GREIG, Chemist, 591, Old Kent Rd., London, S.E.

Business for Disposal.

CHEMIST, DRUGGIST, expensively fitted. A 1 position. Main thoroughfare, N.W. Returns £600 yearly, rapidly increasing. Ingoing £480, or near offer, including about £250 stock. Good house. Rent £70, worth £100. Lease 14 years. HAINES & Co., 16, Red Lion Sq., Holborn.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, MARCH 25.

Imperial Institute.

House Dinner at 6.45 p.m.

"Climbing and Exploration in the Karakoram-Himalayas" (Illustrated), by W. M. Conway, at 8.30 p.m.

TUESDAY, MARCH 26.

Royal Institution of Great Britain, at 3 p.m.

"The Internal Framework of Plants and Animals" (Eleventh Lecture), by Professor Charles Stewart.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

Royal Photographic Society, at 8 p.m.

"The Evolution of Photographic Objectives."

WEDNESDAY, MARCH 27.

Imperial Institute.

Concert Dinner at 6.30 p.m.

Ladies' Concert at 8.30 p.m.

Chemical Society.

Anniversary Meeting, at 3 p.m.

Annual Dinner at the Hôtel Métropole, at 7 p.m.

Society of Arts, at 8 p.m.

"Modern Photogravure Methods," by Horace Wilson.

University College (London) Chemical and Physical Society at 5 p.m.

Ordinary Meeting.

THURSDAY, MARCH 28.

Royal Institution of Great Britain, at 3 p.m.

"Animism," by Dr. E. B. Tylor.

Society of Arts, at 4.30 p.m.

"Chitral and the States of the Hindu Kush," by Captain F. E. Younghusband.

School of Pharmacy Students' Association, at 7 p.m.

"Dispensing Notes," by various Members.

"Report on Inorganic Chemistry," by Aubrey H. C.

Chemists' Assistants' Association, at 8.30 p.m.

Short Papers by Members.

FRIDAY, MARCH 29.

Royal Institution of Great Britain, at 9 p.m.

"The Structure of the Sugars and their artificial Production," by Professor H. E. Armstrong.

Edinburgh Chemists' Assistants' and Apprentices' Association, at 9.15 p.m.

"Emp Belladon" by Peter Boa.

"Suggested B.P. Emulsions," by Claude F. Henry.

SATURDAY, MARCH 30.

Royal Institution of Great Britain, at 3 p.m.

"Waves and Vibrations" (Fifth Lecture), by Lord Rayleigh.

Geologists' Association (London), at 3 p.m.

Excursion to Hampstead.

Exchange.

[Notices of books, apparatus, etc., for exchange, exceeding thirty words, including name and address are inserted free, but must not partake of the nature of ordinary advertisements.]

OFFERED.

PINDER'S ROTARY PILL-COATING MACHINE to take 1 lb. pills; also a 10-gallon copper still, with head for luting. Send best cash offers to Rudd, Pharmaceutical Chemist, Ripon.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, MARCH 30, 1895.

MARKET REPORT.

Chemicals and Drugs.

THE CHEMICAL MARKET.

THURSDAY, MARCH 28, 1895.

The chemical market has been very quiet since our last, and quotations have undergone but little change, remaining as last week with one or two exceptions. Citric acid is firmly held, but quotations are unchanged, whilst tartaric acid has been little inquired after. Oxalic acid is steady, whilst of the ammonia compounds sulphate remains a very dull market, and another decided fall has occurred during the week. Carbonate of ammonia and sal ammoniac are unchanged. Borax remains a weak market, whilst ashes and arsenic are steady at unaltered rates. Copper sulphate has been quiet, the cheaper brands having somewhat fallen. Cream of tartar remains very steady and in good supply; quotations are unchanged. Mercurials are unchanged, whilst quicksilver has shown a continued weakness in second hands, although importer's prices are maintained. Potash and soda compounds are quiet at unchanged rates.

ACID BORACIC.—Crystals are worth 30s.; powdered, 31s. **ACID CITRIC.**—Is firmly held, at unchanged rates. It is still quoted at 1s. 1½d. to 1s. 2d., according to quality.

ACID OXALIC.—No change has occurred, and a fair amount of business has been done at the quoted rate of 3½d., net ex rails.

ACID TARTARIC.—The market has been quiet, and quotations remain unchanged. English makers quote at 10½d. to 11d. Foreign ditto, both powder and crystal, at 10½d.

AMMONIA SALTS.—Sulphate: A very quiet market since our last, and prices have fallen still further. The closing quotation is £10 15s. for grey 24 per cent. Carbonate: There has been a fair demand at last week's rates, quotations being 3½d. to 3¾d. Sal ammoniac: Unaltered, first quality being quoted at 39s., with seconds at 37s.

ASHES.—Rather quiet at unchanged rates. American is quoted at 40s., with pots at 23s.

ARSENIC.—The supplies continue somewhat poor, and the price is fully maintained at 15s. for powdered white.

BACCHING POWDER.—The market remains quiet, with quotations unchanged at 8s. 3d.

BORAX.—In very dull demand. The Syndicate prices are maintained at 20s. for crystals, and 21s. for powdered, but in second hands it is offered at fully 6d. per cwt. less.

COPPER SULPHATE.—The market is dull. The cheaper brands are somewhat easy at £14 15s., whilst the best qualities are still returned at £15 10s.

CREAM OF TARTAR.—Last week's quotations are maintained, but only a small amount of business has been done at the quoted rates. Finest French white crystals are worth 63s. 6d., whilst German powder is quoted on the spot at 65s. 6d. to 66s.

MERCURIALS.—Unchanged. Quantities up to 28 lbs. are still quoted at: Calomel, 2s. 8d.; red precipitate, 3s.; white ditto, 3s.; corrosive sublimate, 2s. 5d.

POTASH COMPOUNDS.—The market is rather firmer. Prussiate quiet at 9½d. Chlorate somewhat firmer. Sales in Liverpool have been made at 4¾d., whilst in London it closes steady at 4½d. Bichromate unchanged at 4½d. to 4¾d.

QUICKSILVER.—Importers' quotations are firm at £6 10s., but in second hands it is still easy, and is now quoted at £6 8s. 6d.

SALTPETRE.—Bengal is quoted on the spot at 17s. 9d. for ¾ to 5 per cent., whilst for arrival, March-April, there are sellers at 17s. 6d. British refined is worth 22s. 6d. to 23s. 6d.

SODA COMPOUNDS.—Caustic Soda, 70 per cent. is unchanged at 28, whilst 60 per cent. is quoted at 27. Crystals are unchanged at 32s. Bicarbonate, 27 5s. (London). Hyposulphite: steady at 26 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, MARCH 28, 1895.

There have been but few changes in the Drug Market since the auctions last week, and only small sales have been made. Caffeine nominally is unchanged, but there is no spot delivery. Crude camphor, both spot and arrival, has been further advanced, and closes very firm, whilst refined camphor is unchanged, although an advance may occur any day. Cocaine is very firmly held at the advance noted last week, and will probably see still higher prices. In Ipecacuanha, some sales, both of Rio and

Carthagena root have been made at steady rates. Jalap is easy, whilst colocynth is firmly held. Menthol is very steady at an advance. Morphine and opium have both been lowered. Of the essential oils, aniseed is again dearer, whilst cassia has considerably advanced, and is firmly held at the quoted rate.

CAFFEINE.—Continues very firm, as there are no quotations for spot delivery. Nominally, quotations remain as last reported, i.e., 1 cwt. lots at 15s., 28 lbs. at 15s. 6d., and smaller wholesale quantities at 16s.

CAMPOR (crude).—The market continues in a very uncertain state, and prices have been further advanced during the week. On the spot, Japanese camphor returns at 125s. to 127s. 6d., whilst China is quoted at 112s. 6d. The quotations for arrival are: Japan, March-April shipment, 122s. 6d. c.i.f., with Chinese, 108s. to 110s. c.i.f.

CAMPOR (refined).—The expected advance in refined camphor has not as yet taken place, although very probable. German and English refiners still quote bells and flowers at 1s. 5½d. for 10 cwt. lots, with squares at proportionate rates.

CHILLIES. remain very quiet, without improvement. At the last sale Zanzibar was bought in at 25s. to 26s., with Sierra Leone at 35s.

GLOVER.—At the sales only a few bales of Zanzibar a lid, fair quality at 25s. Private sales of fair to good fair have been made at 25½ to 26½.

COCAINE.—Very firm at last week's quotations of 20s. 3d. for 100 oz. lots, with smaller wholesale quantities at 20s. 6d. It is probable that the quotations will be still further advanced, as it is very firmly held at these rates.

COCHINEAL.—Quiet but steady. A few sales have been made on the basis of 1s. 4½d. for both black and silver.

CODEINE.—Is easy at a fall of 6 per cent. It is now quoted at 11s. 6d. to 12s., second-hand holders offering at 11s. 6d.

COLOCYNTH.—Steady. Private sales of good Turkey apple have been made at the rate of 1s. 6d., and holders now ask 1s. 8d.

COFAIRA.—Moroccan is steady, at 1s. 7s. Para balsam has been sold privately at 1s. 5d.

IPCACUANHA.—Since the sales of Rio and Carthagena root have been in fair demand at steady prices, the previous quotations being full maintained.

JALAP.—Remains quiet. Some business has been done privately in fair Vera Cruz, at 1s. 1d.

MENTHOL.—Continues very firmly held. On the spot quotations nominally remain unchanged at 15s. 6d., but it cannot be brought under 16s. Forward rates are 15s. to 15s. 6d., c.i.f. terms, but there is little offered.

MORPHINE.—Easy, at the reduced quotation of 4s. 7d. to 4s. 8d., according to quantity, small wholesale quantities at 4s. 10d.

OILS (ESSENTIAL).—Star Anise: During the week 6s. 2d. has been paid on the spot, and this price is now bid and refused. It is offered to-day at 6s. 3d. For arrival it is quoted at 6s. 2d. c.i.f. terms. Cassia: Very steady at an advance of 6d. to 8d. It is to-day firmly held at 4s. 6d. Peppermint, H. G. Hochkiss brand is steady at the unchanged rate of 9s. 9d. to 10s. Japanese oil, containing 40 per cent. of menthol, is firm at 8s. 6d., with demethylated oil at 7s. Lemon-grass unchanged at 1¾d. to 2d. Spearmint, H. G. H. oil is steady at 10s. Eucalyptus: There are no sales to report, and the demand has altogether died out.

OILS (FIXED) AND SPIRITS.—Cod Liver oil: The market is very weak, and it is impossible to give a reliable price for new oil, which is quoted at widely different rates. Lined: A weak market, and quotations have been reduced. It is now returned at £19 15s. to £19 17s. 6d. Cotton firm and somewhat advanced. It is now quoted at £17 to £17 15s., according to brand. Coconut: Ceylon is quoted at £22 15s.; Cocks, £24 15s.; Mauritius, £22 15s. to £23. Rape has been fairly steady. Refined oil is quoted at £22 5s. Turpentine: The market is quiet and prices somewhat easier. American spirit is worth 22s. 9d. on the spot.

OPUM.—During the week business has been steady at fully last week's rates. Quotations: Turkey, soft shipping descriptions 12s. to 12s. 6d., best druggists' 10s. to 10s. 6d., seconds ditto 9s. to 9s. 6d. Persian 11s. to 12s.

PILOCARPINE.—Quotations for hydrochlorate and nitrate remain unchanged at 7s. 6d. to 8s. per gramme.

SENEGA.—Quiet. Fair root offers at 1s. 5d.

SOY.—Dull of sale. Fair Chinese offers at 10d.

QUININE. A fair amount of business has been done in the best German makes on the basis of 11½d. to 11¾d.

PERU (BALSAM). But little offered. It is held for 8s.

SHELLAC.—There has been no improvement in the demand, and small sales only have been made. For arrival there are buyers of T. N. orange at 10½s., c.i.f.

Modern Pharmaceutical Industries.

AERATED WATERS.

[JEWsbury AND BROWN'S NEW MANUFACTORY.

The gradual and continuous growth of the mineral water business of Messrs. Jewsbury and Brown has recently found expression in the erection of a new manufactory, which, we should judge, is unsurpassed for the purpose for which it is required. Towards the beginning of the century this firm began the manufacture of mineral waters at the premises, which they still occupy as a pharmacy, 113, Market St., Manchester. In consequence of the appreciation with which their goods were received, they had to remove to premises which were devoted solely to this branch of their business. Rather more than a quarter of a century ago they made another removal, from the same cause, to the establishment which they have just closed, at the corner of Grosvenor Street and Downing Street. As the taste for aerated beverages in recent years has become more popular, their trade has increased by leaps and bounds, and they have been compelled to erect the manufactory, of which, we think, a description will not be unacceptable to our readers.

On an admirable site at the north end of Ardwick Green, which is probably the largest open space in Manchester, a handsome building has been erected from the designs of Messrs. Horsfield and Son. It is in the Tudor style, and is built of red Ruabon brick relieved with massive sandstone dressings. The main building has a frontage of one hundred feet and a depth two hundred and twelve feet to Charlton Place in the rear. At the south-west angle a fine tower rises to a height of ninety feet; this overlooks the Green, and, being situated on a natural elevation, commands very extensive views. In the base of the tower is the main entrance fitted with wrought iron gates of an appropriate and artistic design. Some idea of the size of the building may be obtained from the statements that it was over a year and a half in construction, and that it has a floorage area of over two acres. It is designed in the form of an oblong of which the end in Charlton Place is closed by large gates giving entrance to a spacious

yard in the centre of building. The yard is covered in by a glass roof supported on light iron girders, and is crossed by a covered-in gangway connecting the upper storeys of the two wings. In furnishing the premises everything has been provided and made to render them as nearly perfect as possible for the requirements of the firm. The west wing is set apart for the reception, cleansing, repairing and storage of "empties," and the east wing for the finishing, storage, and dispatching of the bottled waters. On the ground floor of the "empties" wing the empty bottles and syphons are received and unpacked. The

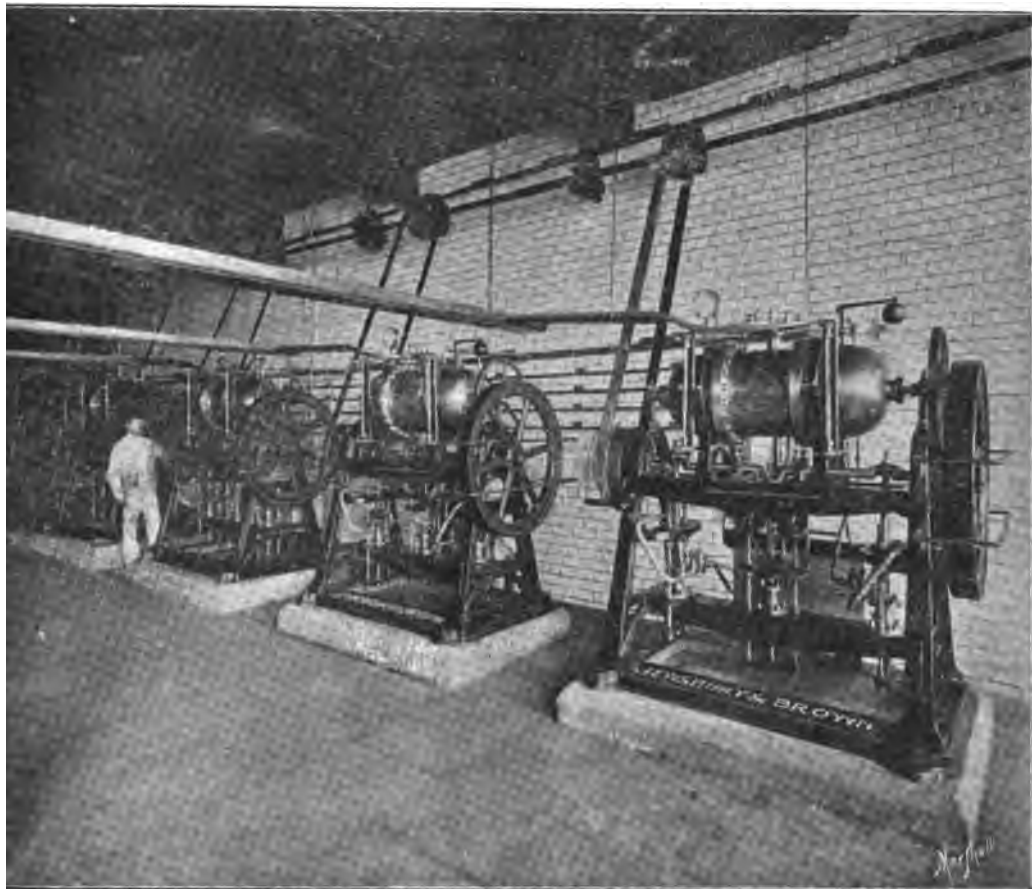


FRONT VIEW OF THE MANUFACTORY.

cases are removed by an elevator to an upper floor to be examined, repaired and stored for future use. The bottles and syphons are passed on to the washing machines, where they are subjected to treatment with hot and cold water. The rinsing is done with filtered water, in fact no unfiltered water is allowed to enter the building, it being even used for the boiler. The machine room occupies the ground floor of the front block. In the angle made by the washing department and the machine room is situated the foreman's office, thus commanding a view of both departments.

large aerating machines are placed along one side the spacious quadrangle, or so-called "room," and in them the aerated waters are distributed to the various bottling machines. These latter are of various kinds, the most interesting being the automatic ones which only require to be fed with bottles and corks, filled bottles being passed on to be wired and sealed. The most ingenious contrivance is an automatic syphon filling machine, this is protected by a patent of this firm's. Only the finest grain tin is used the pipes which convey the various waters. Block is not considered by Messrs. Jewsbury and Brown to be sufficiently pure. The piping in the machine room alone must represent a considerable sum of

washed every day. Above this is the sugar store, from which the sugar is passed down "shoots" into the large jacketed pans in the syrup room. The syrup is then conducted by its own gravity into a large number of huge earthenware jars used for storage purposes. The flavoured syrups used for the waters are placed in large slate cisterns, from which they are automatically drawn off by the bottling machines on the ground floor. Here are also found three rows of large slate cisterns containing the various solutions—soda, potash, lithia, etc.—for feeding the aerating machines. The water supplied to Manchester is exceptionally good; but this notwithstanding, it is subjected to the most efficient system of filtration that has been



AERATING MACHINES.

money, as it forms a complete network overhead. At the top of the yard and contiguous to the boiler house is the gas generating room. It is here, if anywhere, that the test of cleanliness can be applied to a mineral water manufactory. In this instance there is not the slightest sign of failure. Perfect order and cleanliness prevail. Here, again, is another piece of apparatus patented by the firm. The acid is regulated in its flow by a contrivance which works automatically in conjunction with the gas holder. So slow and well regulated is the passage of the acid into the generators that there is no appreciable rise of temperature, and no sudden evolution of gas to cause undue pressure upon any part of the apparatus. In the syrup solution room the same scrupulous cleanliness is manifest, the floor being thoroughly scrubbed and

devised. After being filtered by mechanical means it is passed through a battery of gravitation filters each having a capacity of 1,500 gallons; all suspended impurities, infusoria, bacteria, etc., are thus completely removed. From the machine room the full syphons and bottles are removed by an elevator to two different floors in the east, or "full," wing. The syphons are polished, labelled, examined by a responsible man, and packed into dozen cases. The cases are brought from the "empties" wing by way of the covered gangway. The bottles are examined and packed away in bins to be kept in stock at a fixed temperature during a certain time, in order that faulty bottles may be detected before being sent out. Upon the ground floor of the "east" wing is situated the dispatching department. It is elevated to the level of the drays and carts so as

not to necessitate any lifting of the goods. A third lift brings down the waters to this department from the stores above. Space forbids us doing more than mention the essence rooms, the extensive bottle and syphon stores, the case-repairing and case-making shops, the syphon-repairing shops, the suite of rooms used for brewing ginger beer, the model stables, and the Oriental tooth-paste department. Nothing but commendation can be expressed for the wise blending of conservatism with the "up-to-date" spirit, which is shown to advantage in the fact that Messrs. Jewsbury and Brown still adhere to the making of their own lemon-flavouring from the finest fruit that is imported direct by them from Messina.

On the upper floor a suite of rooms, one above the other, extending into the tower, is used for analytical and research work. Chemical and bacteriological apparatus of every kind is provided, and daily and weekly examinations are made of the various solutions and waters used and made by the firm, and also of the Manchester town water. The laboratories are in the charge of Mr. C. S. Ellis, A.I.C., F.C.S. A special feature of the business of Messrs. Jewsbury and Brown is their large export trade. This has rapidly extended during recent years, in consequence, probably, not only of the superiority of their preparations, but of the great attention given to the packing of them, by which the breakages have been reduced to less than one per cent. The welfare of the employes has been well considered. Separate dining halls and kitchens have been provided for the clerks and the workpeople. These are capacious, well lighted, heated, and efficiently ventilated. The meal times are rendered as enjoyable as possible by means of newspapers, chess, and draughts.

The main vestibule and staircase leading to the general offices are very imposing. The walls are lined with tinted brickwork, and the pavement is laid in ceramic mosaic. The woodwork is of teak. Tinted bricks are used for lining the general office, and the partitions, desks, and fittings are of teak and pine. This apartment is peculiarly bright and cheerful, and is furnished with telephones to every department of the establishment. The offices of Mr. Stones and Mr. Bardsley (the two partners) are really sumptuous, being panelled in teak and other hard woods, and furnished with every requisite that will not simply expedite the dispatch of business, but make it a genuine pleasure.

It is noteworthy that there is no paint and no plaster in the whole building, the ceilings being open to the flooring above, which is of varnished pine. No apparatus or bins of any kind are placed against the walls. Thus there exists no excuse for the harbouring of an ounce of dirt.

The scrupulous care exhibited in the erection of this manufactory emphasises the same care which Messrs. Jewsbury and Brown have conscientiously shown throughout their trade career in always sending out the best article that can be produced irrespective of the cost of production.

Exchange.

OFFERED.

BOOKS.—Offers wanted for 'Buchan's Domestic Medicine,' published 1897. Fair condition, clean. Any reasonable offer accepted.—J. Flemons; The Pharmacy, Dunstable.

MONOCULAR MICROSCOPE, by Browning, with lot of slides and accessories, cost £12, little used. Also 'Quain's Dictionary of Medicines,' perfectly new, cost 43s. Cash offers.—Chemist, 85, Unthinks Road, Norwich.

'LOCK'S MANUFACTURE OF SULPHURIC ACID' (New).—15s. 6d. (published £3 12s. 6d.). 'Gordon's Electricity and Magnetism,' 3rd Ed., 2 vols., fully illustrated, 17s. 6d. (published £2 2s.). Both free. Davis, "Chestnuts," Gordon Hill, Enfield.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, APRIL 1.

Royal Institution of Great Britain, at 5 p.m.
General Monthly Meeting.
Society of Arts (Cantor Lectures), at 8 p.m.
"Commercial Fibres" (Third Lecture), by Dr. R. Morris.
Society of Chemical Industry (London Section), at 8 p.m.
"The German Patent Laws and their Relation to Home and Foreign Inventions," by Dr. Carl Pape.
TUESDAY, APRIL 2.

Pharmaceutical Society of Great Britain.
Benevolent Fund Committee.
Finance Committee.
General Purposes Committee.
Royal Institution of Great Britain, at 3 p.m.
"The Internal Framework of Plants and Animals" (Twelfth Lecture), by Professor Charles Sherrington.
Society of Arts (Foreign and Colonial Section), at 8 p.m.
"My Recent Voyage in Siberia," by Captain Wigan.
Institution of Civil Engineers at 8 p.m.
Ordinary Meeting.
Aberdeen Chemists' and Druggists', Assistants', and Apprentices' Association, at 9.30 p.m.
Open Night.

Plymouth, Devonport, Stonehouse and District Chemical Association (Junior Section), at 8 p.m.
Annual Ball at the Foresters' Hall, Octagon.

WEDNESDAY, APRIL 3.

Pharmaceutical Society of Great Britain, at 11 a.m.
Council Meeting.
Pharmacy Club, at 6.45 p.m.
Meeting at the Café Royal.
Society of Arts, at 8 p.m.
"Sand Blast Processes," by John J. Holtampliff.
Geological Society of London, at 8 p.m.
Evening Meeting.

THURSDAY, APRIL 4.

Royal Institution of Great Britain, at 3 p.m.
"Animism" (Second Lecture), by Dr. E. R. Taylor.
Linnean Society of London, at 8 p.m.
"On the Cyrtandraceae of the Malay Peninsula," by H. N. Ridley.
Chemists' Assistants' Association, at 8.30 p.m.
Musical and Social Evening.
Liverpool Pharmaceutical Students' Society, at 8.30 p.m.
"Photo-Chemistry," with practical demonstration by James R. Burn.
Glasgow and West of Scotland Pharmaceutical Association, at 9.15 p.m.
Annual Business Meeting.

FRIDAY, APRIL 5.

Royal Institution of Great Britain, at 9 p.m.
"Argon," by Lord Rayleigh.
Geologists' Association (London), at 8 p.m.
"The Rocks and Scenery of Western Norway" (Illustrated), by Wintour F. Gwynnall.
Sheffield Microscopical Society, at 8.30 p.m.
"The Theories of Respiration in Insects," by J. Jenkinson.

SATURDAY, APRIL 6.

Royal Institution of Great Britain, at 3 p.m.
"Waves and Vibrations" (Sixth Lecture), by Lord Rayleigh.

Late Advertisements.

Assistants Wanted.

MESSRS. J. KEMP & CO., Chemists, Lincoln, require a Junior ASSISTANT, age about 21, who has accustomed to a good-class general business. State particulars in first letter and enclose photo.

IMMEDIATELY.—An energetic ASSISTANT wanted temporarily to fill vacancy caused by illness of doors. Brighton. Apply personally to MATTHEW ELGIN Crescent, Notting Hill, W.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, APRIL 6, 1895.

MARKET REPORT.

Chemicals and Drugs.

THE CHEMICAL MARKET.

THURSDAY, APRIL 4, 1895.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

In the Chemical Market business has been very quiet since our last, and quotations practically remain unaltered, any changes representing for the most part a depreciation. Citric acid remains firm at the quoted rates, which are unaltered, whilst there are few inquiries for tartaric acid, which is easy at the quoted prices. Of ammonia compounds, sulphate continues a very flat market, and closes at easier rates than last week. Carbonate of ammonia and sal ammoniac are unchanged. Borax is quiet at unchanged rates, whilst arsenic and ashes are firm. There has been a fair amount of business passing in sulphate of copper at unaltered rates. Cream of tartar is plentiful, and closes firm at the last quotations. Mercurials are unchanged, whilst quicksilver is a trifle firm in second hands. Potash and soda compounds are unchanged, with the exception of prussiate of potash, the quotations for which have been considerably lowered by the manufacturers.

ACID BORACIC.—Crystals, 30s.; powdered, 31s.

ACID CITRIC.—Remains a steady market and business has been done at fully last week's rates. It is still quoted at 1s. 1½d. to 1s. 2d. according to quality.

ACID OXALIC.—No movement has occurred in this, and a fair amount of business has been done at the quoted rate of 3½d. net ex rails.

ACID TARTARIC.—Little business passing, and although quotations nominally remain unchanged, for the foreign brands of acid fractionally easier prices would be accepted. English makers quote at 10½d. to 11d.; foreign ditto, both powder and crystal, 10½d.

AMMONIA COMPOUNDS.—Sulphate: Still presents a very dull market, and since our last quotations are somewhat easier. The closing prices for grey 24 per cent. is £10 13s. 9d. to £10 15s. Carbonate: Steady at the unchanged rates of 3½d to 3¾d. Sal Ammoniac: Unaltered, first quality being still worth 30s.; with seconds at 37s.

ASHES.—Steady at unaltered rates, American being quoted at 40s., with pots at 25s.

ARSENIC.—The supplies are still none too plentiful, and the quotation for powdered white remains steady at 15s.

BLEACHING POWDER.—The quoted rate is still 8s. 3d., but there are not many inquiries.

BORAX.—Continues to present a weak market. Nominally, the prices are unchanged, 20s. for crystals and 21s. for powdered, but it can be readily obtained from second-hand holders at fully a per cent. less.

COPPER SULPHATE.—Steady. A fair amount of business has been done on the basis of £14 15s. to £15 10s., according to brand.

CREAM OF TARTAR.—A firmer tone prevails in this market, and last week's rates are maintained. Quotations for the finest white French crystals are 63s. 6d., whilst German powder is worth 65s. 6d. to 66s. on the spot.

MERCURIALS.—Unchanged. Quantities up to 28 lbs. are still quoted at: *Colomel*, 2s. 9d.; *red precipitate*, 3s.; *white ditto*, 3s. *corrosive sublimate*, 2s. 5d.

POTASH COMPOUNDS.—A dull market. *Prussiate*: The makers have reduced their prices from 9¾d. to 9d. *Chlorate*: Fairly steady. Sales in Liverpool have been made on the basis of 4¾d., whilst the quoted rate in London is 4¾d. *Bichromate* is unchanged at 4¾d. to 4¾d.

QUICKSILVER.—Importers still return at £6 10s., and in second hands it is a trifle firmer at £6 8s. 6d. to £6 9s.

SALTPETRE.—There is a firm tone in the market for Bengal, which is quoted on the spot at the unchanged rate of 17s. 9d. for 8½ to 5 per cent. *British refined* is quoted at 22s. 6d. to 23s. 6d.

SODA COMPOUNDS.—*Caustic Soda*, 70 per cent. is unchanged at £8, with 60 per cent. at £1 less. *Crystals* steady at 38s. *Bicarbonate*, £7 5s. (London). *Hypophosphite*: steady at £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, APRIL 4, 1895.

The usual fortnightly drug sales passed off very quietly, and the general tone of the market was very dull. Aloes are generally firmly held; no Cape was offered to-day, and holders privately ask advanced prices. Buchu leaves sold fairly well at steady rates for good, bright, short leaves. A very large amount of *asafoetida* was offered, of which a good proportion was sold at fairly steady rates. Benzoin was in fair supply, and some of the best grades fetched fancy prices. *Ipecacuanha* was in moderate supply, and a fair amount of business was done at fully steady rates. *Eucalyptus* oil sold very cheaply when offered without reserve. Beeswax was in good supply and steady prices were realised, especially for Madagascar wax. The market for crude camphor still remains very uncertain, and spot quotations for the Chinese article have been further advanced, whilst for forward shipment there are no offers. The position of the various alkaloids is practically unchanged.

ACACIA.—A moderate supply only was offered to-day. Two casks fine white picked gum sold without reserve at £6. For *Soudan* sorts there were no inquiries, and all was bought in. A parcel of nine casks of *Aden* gum was bought in at 42s. for fair mixed bright pale and amber.

ALOES.—No Cape was offered to-day. A parcel of 20 kegs of bright softish *Socotrine* aloes was bought in at 72s., whilst 20 boxes of fair livery *Curacao* were knocked down at 45s., subject to approval. A parcel of 200 galls of *Curacao* was held for 27s. dark quality, with good bright *Socotrine* at 80s. A parcel of 210 bags of *Curacao* sold well at the rate of 14s. to 18s.

AMBERGRIS.—A fair amount was offered to-day, but no sales were effected. Bought in at prices varying from 50s. to 80s.

AMMONIACUM.—In good supply, but all was bought in at the following rates: Fair almonds, slightly blocky, 50s.; mixing blocky and almonds, 35s. to 45s.; other qualities, 30s. to 35s.

ANISEED.—Chinese star anise was bought in to-day at 30.

ANNATTO SEEDS.—Bought in at 3¾d. for fair bright seed.

AROMATIC WATERS.—At to-day's sales a parcel of French aromatic waters was again offered, consisting of rose, orange flower, and mint water. All were again bought in at the rate of 5d. per lb.

ASAFOETIDA.—A very large quantity, amounting to 661 pack ages were offered to-day, and met with a fair demand, at fairly steady rates. Mixed greyish and pinky black sold at 72s. 6d. to 80s. Other qualities 50s. to 65s.

BENZON.—The market was quiet for *Sumatra* to-day, four cases of ordinary seconds sold to-day at £6 10s., whilst fair

all fibrin does not develop a disagreeable odour, like most of the hamoglobin preparations. The "tabloids" are not costly, being supplied in bottles of 100 at 1s. per bottle. The dose suggested is one or two thrice daily. *Thymus Gland "Tabloids"* consist chiefly of nuclein and nucleo-albumin. The general idea is that these substances increase the number of leucocytes in the blood and are, therefore, found to be of value in all lymphatic conditions. They have been especially useful in some forms of pernicious anemia and leucocythemia. *Dried Sulphate of Iron "Tabloids"* disintegrate readily when swallowed with a draught of water and afford a very pleasant and effective means for administering the salt of iron. *"Zymine Tabloids"* and *Compound "Zymine Tabloids"* are keratin-coated in accordance with the suggestion of a well-known professor of therapeutics, it being the assumption that "Zymine," or the ferments of the pancreas, when taken by the mouth are digested and destroyed by the gastric secretion. These "tabloids" are found to pass intact through the pylorus, and are quickly dissolved and rendered active in the alkaline secretion of the duodenum and intestinal canal. *Potassiumate of Zinc "Tabloids"* are made of such strength that one "tabloid" dissolved in 1 oz. of water makes the proper strength of solution for injection, or for gargling the throat in putrid conditions. Such a solution is said to be most effective in gleet. The salt is powerfully astringent, as well as antiseptic and germicidal, and for persons travelling about who are unable to carry large bottles of solutions they are said to be found most convenient and effective. The "tabloids" may be dissolved in the barrel of an ordinary glass syringe full of water, as required. Messrs. Burroughs, Wellcome & Co. also announce that they have successfully produced a dried anti-diphtheritic serum of full potency, possessing the following advantages:—A full guarantee as to its keeping properties; it is perfectly sterile and the most convenient for use; and it dissolves readily in cold water, which, before being used, should be freshly boiled and sterilised. The contents of each tube equals 10 C.c.'s of normal anti-diphtheritic serum, and may be dissolved (for use) in 5 C.c.'s of water, sterilised by boiling. This will be found sufficient for one dose. The serum is prepared under the direct personal supervision of a well-known London bacteriologist, in strict accordance with the latest developments, ensuring a most powerful immunising serum, so that both for potency and freedom from septic influences the new product is beyond question. The *Anti-Diphtheritic Serum Essiccum* is supplied in tubes containing 1 gramme at 1s. each.

Company Business.

WILLIAM ESLEY AND CO., LIMITED.—Registered March 16, by Waterlow and Sons, Limited, London Wall, E.C., with a capital of £10,000 in £5 shares. Object, to enter into an agreement with W. Esley for the acquisition of the business of manufacturing chemist as hitherto carried on under the style of William Esley and Co., at Chesterton, Staffordshire, and to carry on and extend the same. The first directors—to be not less than three nor more than five—are H. Crutchley, J. Birks, and F. Creed. Qualifications, 100 shares. Remuneration to be fixed by the company.—*Financial News.*

Late Advertisements.

Assistants Wanted.

THOMAS G. STONHAM & SON, Maidstone, require a qualified ASSISTANT. Age about 24. Must have had experience in good-class Dispensing and Retail. Apply by letter, stating full particulars, age, height, and salary expected. Enclose photo, to be returned.

AT once.—Junior ASSISTANT, steady and trustworthy, with good references, for a Prescribing, Dispensing, and general Retail business. Address, with full particulars as to age, height, salary required, references, and enclosing photo, to F. G. BAYLEY, Chemist, Seaside Rd., Eastbourne.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

TUESDAY, APRIL 9.

Royal Colonial Institute, at 8 p.m.

Ordinary Meeting.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

Royal Photographic Society, at 8 p.m.

"Notes on the Hurter and Driffield system of speed testing," by Mrs. Acworth and Dr. Acworth.

WEDNESDAY, APRIL 10.

Sheffield Pharmaceutical Society, at 8.30 p.m.

Paper by S. T. Rhoden.

THURSDAY, APRIL 11.

Geologists' Association (London).

Excursion to the Tertiary Beds of the Isle of Wight.

Leave London Bridge (L.B. & S.C.R.) at 4.55 p.m.

Liverpool Pharmaceutical Students' Society, at 8.30 p.m.

Musical and Social Evening.

FRIDAY, APRIL 12.

Geologists' Association (London).

Excursion to Whitecliff Bay.

SATURDAY, APRIL 13.

Geologists' Association (London).

Excursion to Freshwater.

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words, including name and address, are inserted free, but must not partake of the nature of ordinary advertisements.]

OFFERED.

PENDLE'S ROTARY PILL-COATING MACHINE, to take 1 lb. pills; also a ten gallon copper still with head for luting. Send best cash offers to RUDD, Pharmaceutical Chemist, Ripon.

Personal and Trade Notes.

Messrs. R. Hovenden and Sons notify that the business of wholesale perfumers, warehousemen, and vendors of patent medicines carried on by Robert Hovenden, Albert Hovenden, Charles William Hovenden, and Robert George Hovenden at 30, 31, 32, and 33, Berners Street, and 87, 91, 93, and 95, City Road, has been dissolved so far as Charles William Hovenden is concerned as from January 12 last. All debts due and owing by the late partnership will be received and paid by the remaining partners, who will carry on the business as before under the style of R. Hovenden and Sons.

With a view to supplying the need felt by pharmaceutical students in Glasgow for systematic courses of instruction, Mr. Thomas Mackenzie, Ph. C., M.P.S., 126, St. Vincent Street, Glasgow, announces the establishment of classes for teaching Chemistry (theoretical and practical) and Physics, Pharmacy and Dispensing, Botany, Materia Medica, and Prescription Reading. There will be both Junior and Senior Sections, the syllabus being based on the requirements of students preparing for the Minor and Major examinations.

Mr. Frank A. Rogers, in succeeding to the well-known and old-established business of Messrs. Corbyn and Co., 327, Oxford Street, London, of which he has had the entire management for the past eight years, expresses the opinion that, as the duties of a chemist become every year of a more exacting character, individual, as opposed to company or store trading, affords the more certain guarantee of the strict adherence to those principles upon which the success of the physician, the welfare of the patient, and the reputation of the chemist, alike depend.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, APRIL 13, 1895.

MARKET REPORT.

Chemicals and Drugs.

THE CHEMICAL MARKET.

WEDNESDAY, APRIL 10, 1895.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

Since our last, business in the Chemical Market has been rather more brisk, and there is a better all-round tendency, although prices have not altered to any considerable extent. Citric acid is quiet at unaltered rates, whilst tartaric acid has been in better demand throughout the week, and the quotations for foreign brands show a slight advance. Of ammonia compounds, sulphate remains very dull, and quotations have fallen fully 5s. per ton since our last. Carbonate of ammonia and sal ammoniac are unchanged. Borax is still exceedingly quiet, and the same applies to sulphate of copper, in which the demand has recently slackened considerably. Ashes are unaltered, and arsenic is firm at steady rates. Cream of tartar is very firm, both French and German makes being in good demand, with a tendency to see higher prices. Importers have advanced the price of quicksilver, the quotations of second-hand holders being correspondingly raised; but mercurials remain unchanged at present. Potash and soda compounds are unchanged and quiet.

ACID CITRIC.—Has been a quiet market, and quotations are unchanged. The prices returned are still 1s. 1½d. to 1s. 2d., according to quality.

ACID OXALIC.—Remains unchanged in steady demand at 3½d. net *ex* rails.

ACID TARTARIC.—A very steady market, and quotations for the foreign brands are somewhat advanced, and will probably go higher. English maker's prices are unchanged, quotations being still 10½d. to 11d.; foreign brands are returned at 10½d.

AMMONIA COMPOUNDS.—Sulphate: Still remains a dull market with nothing doing at all, and prices have fallen from 5s. to 7s. 6d. further during the week. Grey 24 per cent. is now returned at £10 7s. 6d. Carbonate: Quotations are still maintained at 3½d. to 3¾d. Sal ammoniac: Unchanged at 37s. to 39s., according to quality. All ammonia compounds are easy, and a fall is not improbable.

ASHES.—Unaltered, American being steady at 40s., with pots at 23s.

ARSENIC.—Is still scarce, and quotations are firmly maintained at 15s. for powdered white.

BLEACHING POWDER.—Still returned at 8s. to 8s. 3d., but there is not much business doing.

BORAX.—The Convention prices are maintained at the old rates, but second-hand holders offer at from 6d. to 1s. per cwt. less than the makers, the quotations of the latter being, crystals, 20s.; powdered, 21s.

COPPER SULPHATE.—Quiet. The market is dull, quotations remaining, nominally, £14 15s. to £15 10s., according to brand, but lower prices may be expected shortly.

CREAM OF TARTAR.—Has been in steady demand throughout the week, and quotations will probably be advanced to-day. The finest French white crystals are worth 63s. 6d. to 64s., whilst German powder is quoted at 65s. 6d. to 66s. on the spot.

MERCURIALS.—At present unchanged. Quantities up to 28 lbs. are still worth: Calomel, 2s. 9d.; red precipitate, 3s.; white ditto, 3s.; corrosive sublimate, 2s. 5d.

POTASH COMPOUNDS.—Generally quiet. *Prussiate* unchanged at last week's rate of 9d. Chlorate dull. Sales have been made in London on the basis of 4½d., but it is freely offered at that rate. Bichromate unchanged at 4½d. to 4¾d.

QUICKSILVER.—Importers have advanced their prices to £6 15s. Second-hand holders, are correspondingly higher, and range from £6 13s. to £6 14s.

SODA COMPOUNDS.—Caustic Soda: Dull of sale at £8 for 70 per cent., with 60 per cent. quoted at £7. Crystals steady at 38s. Bicarbonate, £7 5s. (London). Hyposulphite: £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

WEDNESDAY, APRIL 10, 1895.

Owing to the proximity to Easter, there has been but little business doing in the Drug Market since the sales last week. Caffeine continues very scarce and firmly held, and only small quantities can be had at any price. Crude camphor remains very firm; at present, however, there are few offers either spot or for delivery, and quotations are not very reliable. Refined camphor is still unchanged, although, of course, the present price of the crude article fully warrants an advance. Cocaine remains unchanged, but is firmly held at the quoted rate. A fair amount of business has been done privately in ipecacuanha, both Rio and Carthagena root since the sales at fully steady rates. Jalap is very easy, and freely offered at the quoted rate. Business in the opium market is dull, and this, of course affects the various alkaloids, which are quiet at the previous rates. Menthol and peppermint oils are steady, and of the other essential oils, star anise is held at last week's rates, and will see higher prices, whilst cassia is very steady.

CAFFEINE.—None to be had for prompt delivery. In second hands, 22s. is now asked and then only small quantities are obtainable.

CAMPOR (crude).—Remains very firm and no sales of Japanese are reported, whilst Chinese is quoted at 117s. 6d. to 120s. For shipment Japan is quoted at 130s. *c.i.f.* April to May, whilst there are no offers of Chinese.

CAMPOR (refined).—Although the present position of the crude outside fully warrants an advance, no move has yet been made, the English and German refiners waiting for one another to take the initiative.

CHILLIES.—At the last sales Zanzibar sold at steady rates, ordinary dull brownish at 23s.; good bright at 28s.; Sierra Leone was bought in at 26s.

GROVES.—Zanzibar was easy at the sales this week, when dark damp sold at 2½d. Picked Penang was brought in at 5½d.

COCAINE.—Last week's quotations of 20s. 3d. per 100 os. lots are unchanged, and it is fairly held at this rate.

COCHINEAL.—A moderate amount of business has been done privately in both black and silver at the rates of 1s. 3d. to 1s. 4d.

COKEINE.—Is easy at the last quotation of 11s. 6d. to 12s., and in second hands it is still offered at 11s. 6d.

COLOCYNTH.—Is fairly held. Private sales of good pale Cyprus have been made at 1s. 8½., and there is a probability of an advance.

COPAIBA.—Privately Maranhão has been selling at 1s. 7d. with Para and Bahia at 1s. 5d.

IPECACUANHA.—Since the last sales a fair amount of Carthagena root has been sold at 3s. 7d. for slightly damaged root. Rio has been in fair demand privately at fairly steady rates.

JALAP.—Very dull of sale, and although for fair Vera Cruz 1s.

is asked, loss would in many cases be accepted; this is for old root. The new root is easy at reduced rates.

MENTHOL.—At the spot holders offer at from 15s. 6d. to 16s. Forward rates are 14s. to 14s. 6d., c.i.f. terms, April to May shipment.

MORPHINE.—Unchanged at 4s. 7d. to 4s. 9d. with small whole-sale quantities at 4s. 10d.

OILS (ESSENTIAL).—*Star Anise*: Is very firm. During the week sales have been made at the rate of 6s. 3d. on the spot, and in some instances as much as 6s. 6d. is now asked. For arrival it is quoted at 6s. 2d. to 6s. 3d., c.i.f. terms. *Cassia* is quoted at 4s. 7d., c.i.f. terms, whilst on the spot 4s. 9d. to 5s. is asked for 75 to 80 per cent. oil. *Citronella* is in steady demand at 1s. 1d. *Lemon-grass*: Dull of sale at 1½d. to 1¾d. *Peppermint*, H. G. *Hotchkiss* brand is unchanged at 9s. 9d. to 10s. *Japanese* oil containing 40 per cent. menthol is quoted at 8s. to 8s. 3d. with *Dementholised* at 7s.

OILS (FIXED) AND SPIRITS.—*Cod liver oil* is very steady, and from all accounts prices will be considerably advanced. During the week sales have been made at 145s., but 150s. is now asked. *Lard* steady at firm rates. Quoted at £19 15s. to £19 17s. 6d. on the spot. *Cotton* very firm, and prices have been advanced fully 15s. since our last quotations. Refined oil is now worth £17 15s. to £18 15s., according to brand. *Coco-nut*: Ceylon is very steady at £23 5s. *Cochin*: £25 10s. *Mauritius*: £23 5s. *Rape* is steadier, refined oil being worth £22 10s. *Turpentine* is very dull of sale, *American* spirit being worth 22s. 3d. on the spot. *Petroleum*: Holders have advanced their prices still further; *American* is now quoted at 6d. to 6½d., with *Russian* at 5½d.

OPUM.—The market is dull, and a fall in the price is not improbable. Nominally quotations are:—*Turkey*, soft shipping descriptions 12s. to 12s. 3d., best druggists, 10s. to 10s. 6d.; seconds, ditto, 9s. to 9s. 6d.; *Persian* 11s. to 11s. 9d.

PERU (Balsam).—Is somewhat scarce, and is very firmly held at a considerable advance, 10s. now being asked.

QUININE.—The market is firm, but little business has been done. Some small sales of the best German makes have been made on the basis of 11½d. to 11¾d.

SENEGAL.—Rather quiet, fair quality root is worth 1s. 5d.

SHELLAC.—At the sales on Tuesday, the demand was very poor, and little business resulted. Steady prices were realised for the amount which changed hands. For delivery, no sales have occurred.

SOY.—Dull of sale, and freely offered at 10d.

Last Week's Drug Sales.

The following information is taken from Messrs. G. N. Souratt and Co.'s Reports:—

SINGAPORE PRODUCE.

CUBERS was again dull of sale, 114 bags, 7 cases, fair, to good quality offered and all bought in, also 15 bags mouldy stalks, and 4 bags siftings.

DRAGON'S BLOOD—the demand has quite fallen off, 45 cases offered, comprising a good assortment of quality, but nothing sold.

GAMBROGE was also dull, and but little enquiry; 32 cases offered were all bought in.

GUM BENJAMIN *Siam*, 38 cases offered, of which 1 case fine small to bold pale free almonds sold at £28, and 3 cases pale bean and pea size, part blocky, at £10. *Sumatra* continues slow of sale. Of 197 cases offered only 24 cases sold; good seconds, rather brown at ends, £9; fair ditto, a little barky, £7; ditto, rather brown sides and ends, £6 10s.; middling, rather brown sides and ends (without reserve) £5 2s. 6d. to £5 7s. 6d. *Palembang*, 20 cases fair seconds, and 25 cases brown thirds, were bought in.

IGNATIUS BEANS.—Five bags fair quality bought in at 3s.

NUTEG PASTE.—Eight cases offered and bought in at 3½d.

OIL CAJEPUTA.—Thirty cases offered, and all bought in.

CHINA AND JAPAN PRODUCE.

ACONITE, JAPAN.—Fifteen bags offered were bought in at 26s.

ANISEED STAR, CHINA.—Ten cases good quality were

bought in at 77s. 6d., and 19 cases ordinary dark and broken at 30s.

ANTIMONY, JAPAN CRUDE.—Seventy-five cases offered, and all bought in at £13.

CAMPOR has been in speculative demand, and business to some extent has been done on the spot, chiefly in *China* at 110s. to 115s., *Japan*, 117s. 6d. to 120s. To arrive sales have been made of *China*, March to May shipment, at 110s., and *Japan* 115s., c.i.f. terms. Thirty-five cases *China* in auction, 17 cases sold, old import, at 115s. reweights.

CANTHARIDES.—Five cases small to bold, part wormy, bought in at 1s.

GALLS, CHINA.—Firm market, with small sales privately at 52s. 6d. to 55s. more money now asked. No sales for arrivals to this market, but business is said to have been done for the Continent at higher prices.

MUSK, TONGKIN.—Dull market, 16 tins offered and bought in.

OILS.—*Aniseed*: Quiet but firm at 6s. 3d. per lb. *Cassia*: Considerable sales at advancing prices from 4s. 6d. to 5s. *Peppermint, Japan*: Fifteen cases fluid and 16 cases menthol offered, and all bought in.

RHUBARB continues uninterruptedly dull, and of 182 cases offered only 20 cases sold. *Shanse Root*: Of 19 cases offered 20 sold. *Round*: Unsorted small to bold fair coat and trim fracture about 1s. 3d.; reddish, 3s. 3d.; grey and dark, 1s. 1d. *Flat* ditto, ditto, with some rough pieces, about 1s. 2d.; red, 1s. 2d.; grey and dark, 1s. *Round and Flat*: One case ditto fair, even pinky, a little dark, 1s. 1d. *Canton Root*: Thirty-seven cases offered, and *High Dried* 56 cases; none sold.

SOY, CHINA.—Twenty-five casks fair bought in at 1s. *Japan*, 18 casks sold without reserve at 5d. and 5½d. per gallon.

VERMILION.—Five cases offered, and bought in at 2s. 1d.

WAX.—(Vegetable) *JAPAN*: One hundred cases good squares bought in at 27s. to 28s., best bid 25s.

BOMBAY PRODUCE.

ALOES SOCOTRINE, BOMBAY.—Quite neglected, 61 kegs offered, were all bought in; 25 cases very low black Mocha, sandy and stoney, were withdrawn; about 10 barrels Zanzibar Hepatic in skins only, coarse and drossy to good hard, were all bought in.

CARDAMOMS.—Seven cases fair Mangalore offered and bought in.

COLOMBO ROOT.—One hundred and sixty-four bags offered, all bought in.

CUTTLE FISH.—35lbs. small to bold, damp and discoloured were again offered and bought in. No bid made.

GUAZA.—Again quiet, and nothing doing; 90 robbins ordinary stalky to fair green offered and bought in.

GUM AMMONIACUM.—Thirty-nine cases and 1 bag offered, of which 5 cases, small to boldish pale free drop, part slightly run and rather seedy, sold at 31s., and 1 bag of dry blocky siftings at 5s.

GUM ASAFOETIDA.—Recent heavy arrivals have seriously depressed the market, and, as was to be expected, prices have given way considerably; of 395 cases and 56 boxes offered 253 cases and 33 boxes sold. The sales opened with a dull tone, the bidding being very sluggish, and good to fine gum sold at a decline of 20s. to 30s. per cwt. and medium grades 10s. to 20s., while low quality went at full rates. Later, with more disposition shown to realise, prices further gave way, and fair to good gum was sold at a decline of 30s. to 40s. per cwt. on last sales rates. Fine bold pale dry Almonds drop sold at 105s. to 110s.; ditto, slightly run, 100s. (three simple cases only); fine small to boldish pale free drop, 90s.; good softish to dry clean grey and pinky block, 70s. to 80s.; softish slight sandy, 70s. to 75s.; later, 60s.; softish to very soft and rather sandy, 60s. to 65s.; brownish, a little red, slight stoney, 65s.; later, 41s. to 43s.; good fair grey and pinky block, dry and part heavy, 60s. to 65s.; ditto softish, and rather sandy, 60s. to 62s. 6d.; later, good fair grey and pinky, mostly block, some loose, fairly dry, sold at 42s. to 50s.; fair to good fair grey and red block, slightly sandy and stoney, 35s. to 43s. good middling grey and pinky half loose, quarter block, part heavy, and some a little foul with matting, 27s. to 41s.; good middling dry

grey block, more or less stoney, 30s.; fair softish block, mixed and foul with matting, 21s. to 23s.; ordinary loose brown broken block, very sandy and stoney, 26s. to 28s.; low ditto, 20s.; very soft, pappy, apparently sea damaged, 20s. to 60s.

GUM MYRRH continues to be freely offered, but sale difficult, of 23 cases, 38 casks, 68 bales, and 28 bags offered; 8 casks good native picked sold at 80s. to 85s.; 1 case fair pale siftings at 60s.; 1 bag small ditto at 50s.; 4 bales pickings, fair, at 35s., and without reserve; 4 bales fair red, native picked at 62s. 6d.; 3 bales fair siftings at 48s.; and 10 bales dark pickings at 23s. to 24s.

SEED, *Coriander*—147 bags offered, and all bought in at 12s. to 15s. *Dill*—37 bags offered and bought in at 15s. *Fennel*—10 bags sold at 21s. 6d. *Thyme*—26 bags offered, and bought in at 12s.

SENA, TINNEVELLY.—130 bales offered; about half sold steadily.

TURMERIC, MADRAS.—28 bags dull finger, bought in at 11s.; highest bid, 9s. 6d.

WOOD, SANDAL.—238 robbins offered; were all bought in.

Late News.

GLASGOW PHARMACEUTICAL ASSOCIATION.—At the annual general meeting of this Association, on the 4th inst., reports were received from the committees appointed to draw up suggestions for a new Pharmacy Bill, and in connection with the revision of the British Pharmacopœia. Subsequently, the annual report and financial statement were submitted and adopted. A full report will appear in next week's Journal.

THE SALE OF PATENT AND SECRET NOSTRUMS.—It is pointed out in *Pearson's Weekly* that in almost all European countries, with the exception of the United Kingdom, more or less stringent restrictions are placed upon the sale of secret nostrums, and those proprietary articles which are commonly but incorrectly called "patent medicines." In Armenia no preparation whatever made by an occult art may be lawfully sold to the public.

STREET EXPLOSIONS.—The Committee of Members of the Royal Society and the Institution of Electrical Engineers appointed to confer with the Electrical Adviser to the Board of Trade, with regard to the circumstances connected with the formation in large quantity of an alkaline deposit on the mains of the St. Pancras Electric Light Supply, and the presence in this deposit, in some cases, of the alkaline metals in an unoxidised condition, have submitted their report to the Secretary of the Board of Trade. They state that they are of opinion that the explosions which have occurred were caused by the firing of an explosive mixture of coal-gas and air, by sparks caused by means of the incrustation found on the insulators of the mains. It was proved to them that sparks might be caused either by the incrustation itself acting as an imperfect electrical conductor, or by moisture coming into contact with metallic sodium or potassium, both of which metals have been found to exist within the incrustation. These metals have been produced by the electrolytic decomposition of alkaline salts, chiefly derived from the soil, and conveyed by moisture along the fibres of the wooden bearers towards the negative conductor. To avoid a repetition of these accidents, the bearers of the insulators at present in use should be replaced by other devices through which moisture is prevented from travelling, and it is recommended that the pattern of insulator in use should be changed, and a pattern adopted in which a longer insulating surface

is interposed between the conductors and the bearer. The Committee is also of opinion that it is desirable that means should be provided by which the conduits can be inspected throughout their length, so far as is necessary to detect incrustations on the insulators. The Committee did not consider it within their province to investigate the causes of the presence of coal-gas within the electric lighting conduits, but obviously that was the primary source of danger.

Parliamentary News.

In the House of Commons on Tuesday last, Mr. Powell-Williams asked the Home Secretary whether his attention had been called to a recent case of death caused by the explosion of a gas cylinder at Fenchurch Street Station, and to the recommendation of the coroner's jury that gas cylinders should be subjected to a Government test and should be stamped, showing that they were capable of resisting the pressure of the gases which they contain; and whether he would take steps, in the interests of public safety and of a large and growing industry, to carry out the recommendation of the jury.

The Home Secretary said he had received a report from an expert on the subject. He intended to invite a further expert inquiry. It was reported to him as most probable that the explosion was not due to an imperfectly welded cylinder, but was caused by the ignition of an explosive mixture which no cylinder would stand, however perfectly it had been tested. But he would request those who were to be consulted on the matter to inquire how far the Government test would be a safeguard, and he would carefully consider the suggestion thrown out by the hon. member.

Partnerships Dissolved.

[From the *London Gazette*.]

George Stephen Woolley, Hermann Woolley, Charles Andrew Johnstone, and Edward James Woolley, carrying on business as manufacturing and pharmaceutical chemists in Manchester, under the style of James Woolley, Sons, and Co. The business will be carried on by James Woolley, Sons, and Co., Limited, whom all debts due and owing by the late firm will be received and paid.

Henry Kellett and Walter Kellett, carrying on business as chemists and druggists at 87 and 89, Chapel Street, Salford, under the style of Henry Kellett, who will continue the business in his own name.

William Chapman and James Harrison, physicians and surgeons, of Garstang, Lancashire.

Henry Spicer, Edward Spicer, and Augustus Spicer, carrying on business as photographic material manufacturers at Surrey Row, Blackfriars, under the style of the Blackfriars Photographic and Sensitizing Company.

Marriage.

On April 3, at St. John's Church, Blackpool, Edith J., daughter of the late J. H. Taylor, of Newton Heath, and Mrs. Taylor—11, Manchester Terrace, Blackpool—to Chas. H. Turner, A.Ph.S., 40, Market Street, Blackpool.

Company Business.

NEWMAN AND OWSTON'S COLOUR AND CHEMICAL COMPANY, LIMITED.—Registered by J. J. Ridley, 33, Old Broad Street, E.C., with a capital of £10,000 in £5 shares. Object, to acquire the business of colour and chemical manufacturers as hitherto carried on by Newman and Owston, and to develop and extend the same. The directors are G. J. Newman and W. A. Owston, senr. Qualification not specified. Remuneration to be fixed by the company. Managing director, J. G. Newman, his remuneration as such being 20 per cent. of the net profits.—*Financial News*.

WANDSWORTH CHEMICAL WORKS, LIMITED.—This company was registered on April 1 with a capital of £10,000 in £1 shares (7500 pref.), to acquire and carry on the business carried on by a company of the same name, and to enter into an agreement with the said company and its liquidator. The number of directors is not to be less than three nor more than five; the first are F. G. Grierson, C. Haughton, L. Cazalet, and E. M. Euan-Smith; qualification, £100; remuneration, £50 each per annum. Registered by Sutton and Co., 3, and 4, Great Winchester Street, E.C.—*Investors' Guardian*.

LEWIS AND BURROWS' DRUG STORES, LIMITED, with a share capital of £100,000, divided into 30,000 six per cent. cumulative preference shares, 60,000 ordinary shares, and 100 deferred shares of £1 each, has been formed for the purpose of acquiring and amalgamating under one general management eleven drug store businesses carried on in various parts of London and the suburbs. The purchase price of the leases, goodwill, stock, plant, and fixtures of the several businesses has been fixed at £65,900, which is to be paid as to £33,900 in cash, as to £18,100 in ordinary and deferred shares, and as to the balance of £13,900 in cash or shares, at the option of the directors. The 100 deferred shares are entitled to one-half the profits after 10 per cent. has been paid on the ordinary shares. There are now offered for public subscription 25,000 preference and 31,900 ordinary shares.—*Financial News*.

JAVA FABRIC.—A company, to be called the "Java Fabric," is in course of foundation to deal in quinine and other chemicals in Burmah, and generally to afford assistance to the planters, who have been for some time in the hands of a ring of quinine merchants in Holland, who keep down the price of bark to starvation point, and run up the price of the finished article, which, during the last few years and largely owing to the quantity of quinine administered in the influenza periods, has been a most profitable business. The planters, it appears, will bind themselves to sell the bark to the "Java Fabric" for a fixed period and at a price double that which the Dutch gentlemen have been giving. They will also retain the option of taking shares in the company.—*Financial Times*.

New Books and New Editions.

OUR TEETH, by VOGHT DITCHAM, M.D. (Ballière, TINDALL, and Cox, London).
LEHRBUCH DER BIOLOGIE DER PFLANZEN. Von F. LUDWIG. 14 marks. (Enke, Stuttgart.)
DIE CHEMIE DES CHLOROPHYLLS. Von L. MARCH-LEWSKI. 2 marks. (Voss, Hamburg.)

Late Advertisements.

Engagements Wanted.

JUNIOR ASSISTANT. Tall. 24. Highest references. MORGAN, 83, Boundary Rd., St. John's Wood.
LOCUM. Age 40. Qualified. Good references. F. G. SHRIMPTON, 6, Grove St., Oxford.
PART-TIME. 3 or 4 Evenings a week. Qualified. References. Age 25. W. H., care of N. S. Jones, 171, Fulham Rd., S.W.
DISENGAGED. Minor requires Part-time or Permanency. London experience. E. JONES, 55, Gloucester St., Belgravia, S.W.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, APRIL 15.

Geologists' Association (London).

Excursion from Sandown (I. of W.) to Freshwater.

TUESDAY, APRIL 16.

Geologists' Association (London).

Excursion from Sandown to Ryde.

Aberdeen Chemists' and Druggists', Assistants', and Apprentices' Association, at 9.30 p.m.

General Meeting.

Royal Photographic Society, at 8 p.m.

A Special Meeting devoted to Photo-Mechanics Processes.

WEDNESDAY, APRIL 17.

Western Chemists' Association (of London), at 8.30 p.m.

Smoking Concert at the Westbourne Restaurant.

THURSDAY, APRIL 18.

Linnean Society of London, at 8 p.m.

"Observations on the Loranthaceae of Ceylon." by F. W. Keeble.

Midland Pharmaceutical Association, at 8.30 p.m.

Social Meeting at Midland Hotel.

FRIDAY, APRIL 19.

Edinburgh Chemists', Assistants', and Apprentices' Association.

Annual Supper.

SATURDAY, APRIL 20.

Geologists' Association (London).

Excursion to Charlton, Kent. Leave Cannon Street, at 2.30 p.m.

Pharmaceutical Cricket Club v. Cheam Common and Cuddington, at Worcester Park.

Personal and Trade Notes.

Dr. Sherrington, of Caius College, Cambridge—at present superintendent of the Brown Institution, in connection with the University of London—has been appointed to the George Holt chair of physiology at Liverpool, vacant by the transfer of Professor Gutch to Oxford.

The Radcliffe travelling fellowship in medicine at Oxford has been awarded to Mr. A. C. Latham, of Balliol.

Mr. Frederick Webb has presented £1000 to the Medical School of St. George's Hospital, to found an annual prize in bacteriology.

The successor to Dr. W. H. Ince, who recently left England to take up the appointment of Assistant Government Analyst for Trinidad, is A. W. Crossley, Ph.D., M. Sc., Berkeley Fellow and Demonstrator of Organic Chemistry at Owens College, Manchester.

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words, including name and address, are inserted free, but must not partake of the nature of ordinary advertisements.]

OFFERED.

'BROWNING'S ILLUSTRATED HISTORY OF ENGLAND' two volumes 25s., will exchange for recent edition of 'Gase's Physics' in good condition, or give cash.—F. S., 10, Bedford Terrace, Kensington, W.

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, APRIL 20, 1895.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, APRIL 18, 1895.

Business in the Chemical Market has necessarily been somewhat restricted during the last week owing to the holidays, but in most cases prices are well maintained, and in one or two instances advances have occurred. Citric acid continues a dull market at unchanged rates but tartaric acid is still in good demand at fully steady rates, and a further advance both of foreign and English brands is not unlikely. Of ammonia compounds, sulphate continues a very weak market, and prices at the close are somewhat easier. Carbonate of ammonia and sal ammoniac are unchanged. Borax is somewhat firmer, at unaltered rates, but sulphate of copper is very quiet at easy rates. Ashes and arsenic are unaltered at steady prices. Cream of tartar shows a very firm market, and business has been very brisk both in French and German makes at an advance of fully 1s. for both powder and crystal. Importers' prices for quicksilver are unchanged, whilst in second hands it is offered at 6d. less. The advance noted last week has not affected the price of mercurials. Potash and soda compounds are unchanged.

ACID CITRIC.—Unaltered, but there has been no demand, and quotations are to a great extent nominal. The prices returned are still 1s. 1½d. to 1s. 2d., according to quality.

ACID OXALIC.—The price is maintained at 3½d. net ex rails.

ACID TARTARIC.—Has again been in brisk demand, and prices are well maintained. A further advance is not unlikely. English makers' prices are as yet unchanged at 10½d. to 11d., foreign brands being returned at 10½d.

AMMONIA COMPOUNDS.—Sulphate: The market remains flat, and prices are again easier at a fall of 2s. 6d. on last week's rates. Grey 24 per cent. is now returned at £10 5s. Carbonate: Unchanged at 3½d. to 3¾d. Sal ammoniac: Prices are unaltered, first quality being worth 38s., with seconds at 37s.

ASBER.—Steady at unchanged rates. American being worth 40s., with pots at 23s.

ARSENIC.—Best white powder is unaltered, and returns at the steady rate of 15s.

BLEACHING POWDER.—A fair amount of business has been done at the steady rates of 8s. to 8s. 3d.

BORAX.—The Convention prices are unaltered from the previous rates of 20s. for crystals and 21s. for powdered, but outside manufacturers continue to offer at 1s. to 1s. 6d. lower than the combination, and a fair amount of business has been done at these rates.

COPPER SULPHATE.—The market has been dull, and since our last prices are somewhat easier. Quotations, which are more or less nominal, are now £14 15s., with £15 5s. asked for the best brands.

CREAM OF TARTAR.—The demand has continued very brisk, and prices have been considerably advanced. The best white French crystals are now quoted at 65s., whilst German powder is worth 67s. on the spot.

MERCURIALS.—Unchanged. Quantities up to 28 lbs. are worth:—Calomet, 2s. 8d.; red precipitate, 3s.; white ditto, 3s.; corrosive sublimate, 2s. 5d.

POTASH COMPOUNDS.—Quiet. Prussiate unaltered at last week's rate of 9d. Chlorate rather firmer. Sales both in London and Liverpool have been made on the basis of 4¾d. Bichromate unchanged at 4¾d. to 4¾d.

QUICKSILVER.—Importers' prices remain steady at £6 15s., whilst in second hands it is offered at £6 14s. 6d.

SODA COMPOUNDS.—Caustic Soda: Quiet at £8 for 70 per cent., with £7 paid for 60 per cent. Crystals unaltered at 38s. Bicarbonate, £7 5s. (London); Hyposulphite, £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, APRIL 18, 1895.

Since our last business in the Drug Market has naturally been somewhat limited, although some changes of importance have occurred. Advanced prices continue to be paid for caffeine, which is exceedingly scarce. In crude camphor there has been but little business, and quotations are, to a great extent, nominal, as there are no sellers; the refined article is unaltered. The makers of cocaine have lowered their prices 1s. per oz. since our last. The opium market is dull, and the prices of the various alkaloids have been again lowered. Sales of Rio and Carthagena root have been made privately at steady rates. Balsam of Peru continues very scarce, and is held at advanced prices. Jalap remains dull of sale, whilst colocynth and copaliba are steady. Of the essential oils aniseed and cassia are quiet but steady at last week's rates, whilst menthol is unaltered. Salicin is steady at unchanged rates. Of the various fixed oils and spirits, petroleum continues to advance in price, whilst turpentine has been a very steady market, and prices are moving up. In quinine the market is firm, but little business has been done.

CAFFEINE.—Since our last report small quantities in second hands have been sold on the spot at fully steady rates. For one parcel 21s. has been paid, and this would be now refused, holders asking 22s. 6d., and we believe this has been paid in some instances. For forward delivery, July-August 17s. is a fair quotation.

CAMPHOR (Crude).—There has been but little business done in the absence of sellers; still, the market remains firm at high prices; on the spot, the quotation for Japanese remains 125s., with Chinese at 117s. 6d. to 120s. For arrival there is nothing offered; nominally, quotations remain at 127s. 6d. c.i.f. for Chinese, and 130s. c.i.f. for Japanese, both April-May shipment.

CAMPHOR (Refined).—No move has been made by the English and German refiners, and quotations remain at 1s. 5¾d. for bells and flowers in 10 cwt. lots, with squares at proportionate rates.

CLOVES.—Quiet. There have been no sales of Zanzibar for delivery. Prices are unaltered.

COCAINE.—The manufacturers lowered their prices on the 10th inst. by 1s. per oz., and the present quotations are as follows:—Hydrochlorate, 100 oz. lots, 19s. 3d., 25 to 100 oz. lots, 19s. 6d.; smaller wholesale quantities, 19s. 9d., with 1 oz. bottles 3d. per oz. extra.

COCHINEAL.—Steady. Both black and silver are worth from 1s. 3d. to 1s. 4d.

CODINE.—The manufacturers have again reduced their quotations, and it is now worth 11s. to 11s. 3d. according to quantity.

COLOCYNTH.—Steady. Good pale Cyprus and Turkey have been selling at fully last week's rates.

COPALIBA.—There have been sales of bright Morahanam at 1s. 7d. to 1s. 7½d. Bakia and Para is steady at 1s. 4d. to 1s. 5d.

IPÊCACUANHA.—*Carthagen* root has been selling privately at 3s. 7d. for slightly damaged root. Sales of *Rio* have been made at the following rates:—Good to fine bold 4s. 9d. to 5s. 3d., fair 4s. 3d. to 4s. 6d., ordinary to middling 3s. 4d. to 4s.

JALAP.—Remains dull of sale at the nominal rates of 11d. to 1s. for fair *Vern* Cruz.

METHU.—On the spot holders still offer at 15s. 6d. for good white crystals, whilst for delivery, near at hand, the rates are 14s. to 14s. 6d., c.i.f. terms.

MORPHINE.—In sympathy with all the opium alkaloids, has been again reduced, this time by 2d., the amended quotation being 4s. 5d. to 4s. 7d. according to quantity, with small wholesale quantities at 4s. 8d.

OILS (ESSENTIAL).—*Star Anise*: Quiet, but steady. Spot sales have been made at 6s. 3d. For arrival there is little offered, 6s. 2d. to 6s. 3d., c.i.f. terms, representing a fair quotation, but there is a firm upward tendency. *Cassia*: On the spot 5s. has been paid during the week for fine quality oil containing 80 per cent. aldehyde. For arrival it is quoted at 4s. 7d., c.i.f. terms. *Citronella* has been selling at fully steady rates from 1s. 1d. to 1s. 1½d. *Lemon-grass*: Flat at 1½d. to 1¾d. *Peppermint*, *H. G. Hotchkiss'* oil is dull of sale at 3s. 9d. *Japanese* oil containing 40 per cent. menthol is steady at 4s. 6d., whilst dementholised is quiet at 6s. 6d.

OILS (FIXED) AND SPIRITS.—*Linseed*: A steady market. On the spot in barrels it is quoted at £20. *Cotton* steady at unaltered rates, quotations for refined oil being still £17 15s. to £18 15s., according to brand. *Coco-nut*: A dull market at earlier rates *Ceylon* being quoted at £23, *Cochin* at £25 to £25 5s., and *Mauritius*, £23. *Rape*, steady; refined oils being still quoted at £22 10s. *Turpentine* decidedly firmer, and a steady demand is reported, *American* spirit being quoted at 22s. 6d. on the spot. *Petroleum*, an exceedingly strong market, and prices have been steadily advanced. For the *American* oil on the spot 9d. to 9½d. has been paid, with *Water white* at 10d. to 10½d., and *Russian* at 8½d. to 8¾d.

OIL (COW LIVER).—Finest non-coagulating new oil has been selling at 140s. to 145s. per farral of 55 gallo.

OPUM.—Quotations remain practically unchanged, but the market is very flat. The prices are:—*Turkey* soft shipping descriptions 11s. 8d. to 12s.; best druggists' 10s. to 10s. 6d.; seconds, ditto, 9s. to 9s. 6d.; *Persian* 11s. to 11s. 8d.

PERU (BALSAM).—Still very scarce, and holders continue to ask as much as 10s.

QUININE. The market is steady but quiet. Small sales of *H. B.* and *B. & S.* brands have been made at the rate of 11¼d. and 12d. respectively.

SALICIN.—In the face of the strong demand at present shown, it is still firmly held at unchanged rates, the net quotations for 1 cwt. lots being 8s. per lb., with 38 lbs. at 8s. 6d.

SHELLAC.—A firm market and advanced prices are now asked. Spot sales of *T.N. Orange* have been made at 10s. For arrival April-June steamer and second orange have been selling at 10s. c.i.f.

SOY.—Presents a steadier market, and fair *Chinese* is now worth 10½d. to 11d.

Late Advertisements.

Businesses for Disposal.

SMALL high-class BUSINESS, with capital Dispensing connection, in good residential London suburb. Established 25 years. Well fitted and stocked. Returns about £500. Satisfactory reasons for disposal, and wholesale references given. Address, A. B., care of Messrs. W. W. Flood & Co., 206, Borough High St., E.C.

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Assistants Wanted.

WANTED immediately, a Qualified ASSISTANT. One desiring a permanency. Would suit a married man, as arrangement could be made for living on the premises. Apply before 1 or after 6 at 49, Wells St., Oxford St., W.

SWANSEA HOSPITAL.—The Dispenser will shortly require a LOCUM TENENS for a fortnight. Minor or Apothecaries' Society qualification. 2 guineas weekly and dinner daily. Cheap lodgings near. Apply, DISPENSER, General Hospital, Swansea.

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ASSISTANT for few months or part-time. 9 years' experience. London preferred. F. SMITH, Bourne, Lincs.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, APRIL 22.

Society of Arts (Cantor Lectures), at 8 p.m.

"Recent American Methods and Appliances Employed in the Metallurgy of Copper, Lead, Gold, and Silver," by James Douglas.

TUESDAY, APRIL 23.

Royal Institution of Great Britain, at 3 p.m.

"Alternating and Interrupted Electric Currents," by Prof. George Forbes.

Society of Arts (Applied Art Section), at 8 p.m.

"Art of Casting Bronze in Japan," by William Gowland.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

WEDNESDAY, APRIL 24.

Geological Society of London, at 8 p.m.

"On the Shingle Beds of Eastern East Anglia," by Sir Henry H. Howorth.

"An Experiment to Illustrate the Mode of Flow of a Viscous Fluid," by Prof. W. J. Sollas.

"Supplementary Notes on the Systematic Position of the Trilobites," by H. M. Bernard.

THURSDAY, APRIL 25.

Royal Institution of Great Britain, at 3 p.m.

"The Liquefaction of Gases," by Prof. Dewar.

Society of Arts (Indian Section), at 4.30 p.m.

"The Coming Railways of India, and their Prospects," by J. W. Parry.

Chemists' Assistants' Association, at 8.30 p.m.

"Essential Oils" in their Relation to (1) The British Pharmacopoeia; (2) Trade," by J. C. Umney.

Chemical Society, at 8 p.m.

"The Action of Nitrosyl Chloride on Amides," by Prof. Tilden and Dr. M. O. Forster.

"The Action of Nitrosyl Chloride on Asparagine and Aspartic Acid: Lævo-rotatory Chloro-succinic Acid," by Prof. Tilden and H. J. Marshall.

"On a Property of the Non-luminous Atmospheric Coal Gas Flame," by L. T. Wright.

"A Constituent of Persian Berries," by A. G. Perkin and J. Geldard.

"Potassium Nitrosulphate," by E. Divers and T. Haga.

"Di-ortho-substituted Benzoic Acids," by J. J. Sudborough.

"Hydrolysis of Aromatic Nitrites and Acid-amides," by J. J. Sudborough.

"Action of Sodium Ethylate on Deoxybenzoic," by J. J. Sudborough.

Liverpool Chemists' Association, at 7 p.m.

"Notes on Adulterated Acetic Acid" and "The Alkaloidal Value of Jaburandi Leaves and Leaf Stalks," by M. Conroy.

"Notes from the Dispensing Counter on some B.P. Preparations," by H. O. Dutton.

FRIDAY, APRIL 26.

Royal Institution of Great Britain, at 9 p.m.

"The Effects of Electric Currents in Iron on its Magnetisation," by John Hopkinson.

Sheffield Microscopical Society, at 8.30 p.m.

Lecture, by J. H. Worrall.

Pharmaceutical Society of Great Britain (North British Branch), at 8.30 p.m.

"Ferrous Phosphate," by George Coall.

"Smaller Sized Pharmacopoeial Pills," by William Lyon.

"Note on Commercial Linseeds," by A. J. Dey and W. B. Cowie.

SATURDAY, APRIL 27.

Royal Institution of Great Britain, at 3 p.m.

"English Music and Musical Instruments of the 16th, 17th, and 18th Centuries" (with illustrations upon original instruments), by Arnold Dolmetsch.

Geologists' Association (London).
Excursion to Brigstock, Geddington, etc. Leave St. Pancras (Midland Railway) at 9 a.m.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, APRIL 27, 1895.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, APRIL 25, 1895.

Since our last, business in the chemical market has been generally somewhat improved, and some changes of interest have occurred. Citric acid remains steady at unaltered rates, but tartaric acid has again proved in very good demand, and, as seemed probable from our last report, both English and foreign brands have been advanced in price. Of the various ammonia compounds, sulphate is still a very dull market, and prices have declined considerably, without, however, being accompanied by a reduction in the other ammoniacal compounds. Ashes and arsenic are unaltered at steady rates, whilst sulphate of copper is a dull market, at nominal prices. Cream of tartar is somewhat scarce and in good demand, and business has been done both in French and German makes at an advance of 1s. on last week's rates. The importers of quicksilver advanced the price on the 23rd inst. to £7, and in second hands it is offered at £6 18s. 6d., consequently all mercurials were advanced 1d. per lb. on the 24th inst. Of the various potash compounds, prussiate is rather firmer, and chlorate has been in steady demand at last week's rates, whilst permanganate is firm at unaltered prices. Soda compounds are unchanged.

ACID, CITRIC—Has been a quiet market at steady rates, and quotations are more or less nominal. It is still worth 1s. 1½d. to 1s. 2d., according to quality.

ACID, OXALIC—Remains unchanged in steady demand at 3½d. net *ex* rails.

ACID, TARTARIC—Continues a very firm market, and foreign makers have advanced their prices during the week, whilst English brands are held at the rate of 11d. Foreign acid, both in powder and crystals, is now quoted at 10½d.

AMMONIA COMPOUNDS.—**Sulphate**: A very dull market, and prices have further declined 12s. 6d. since our last. At the close grey 24 per cent. is quoted at £9 12s. 6d. **Carbonate** unchanged, but very quiet at 3½d. to 3¾d. **Sal ammoniac** in dull demand at the nominal rates of 39s. for first quality, with seconds at 37s.

ASHES—Unaltered, American being steady at 40s., with pots at 25s.

ARSENIC.—Supplies are still but small, and best powdered white is firm at the rate of 15s.

BENZOLE.—Steady at unaltered rates; 50 per cent. is worth 1s. 0½d., with 90 per cent. at 1s. 1d.

BLEACHING POWDER—Has been in steady demand at the unaltered rates of 8s. to 8s. 3d.

BORAX.—Second-hand holders continue to offer at 1s. to 1s. 6d. lower than the Convention prices, which are unchanged from the last rates of 20s. for crystals, with 21s. for powdered.

COPPER SULPHATE.—A quiet market, and although quotations are unchanged, only a nominal amount of business has been done on the basis of £14 15s. to £15 5s., according to brand.

CREAM OF TARTAR.—The demand has continued very brisk, and prices have advanced 1s. more since our last. On the spot German powder is worth 68s., whilst the best white French crystals are quoted at 66s.

MERCURIALS.—Consequent upon the further advance in quicksilver, makers of mercurials yesterday made an advance of 1d. per lb., and the current quotations for quantities up to 25 lbs. are now as follows: *Calomel*, 2s. 10d.; *red precipitate*, 3s. 1d.; *white ditto*, 3s. 1d.; *corrosive sublimate*, 2s. 6d.

POTASH COMPOUNDS.—In somewhat improved demand. *Prussiate* is firmer at 9d. to 9½d. *Chlorate*, steady. Business has been done both spot and forward in London and Liverpool at the rate of 4½d. *Bichromate* unchanged at 4½d. to 4¾d. *Permanganate* steady. Small crystals offer at 52s. 6d. to 55s.

QUICKSILVER.—In first hands the prices have been again advanced, and it is now offered at £7, whilst second-hand holders ask £6 18s. 6d.

SALTPETRE.—On the spot *Bengal* is steady at the unaltered rate of 17s. 9d. for 3¼ to 5 per cent., whilst for arrival April to June 17s. 6d. has been paid. British refined is worth 22s. 6d. to 23s. 6d.

SODA COMPOUNDS.—*Caustic soda*: Unchanged at £8 for 70 per cent., with 60 per cent. at £1 less. *Crystals*: Quiet at 38s. *Bicarbonate*: £7 5s. (London). *Hypo-sulphite*: £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, APRIL 25, 1895.

In the drug market business seems now to have fairly settled down again, and during the last week has been fairly satisfactory. At the same time, some important changes have occurred, of which brief mention will be made. Extreme prices continue to be paid for caffeine on the spot whenever obtainable in second-hand. For crude camphor there are no offers on the spot, whilst for arrival steady prices are asked. There has been no movement in refined camphor. The manufacturers of cocaine have again lowered their quotations 1s. per oz. since our last report. Balsam of copaiba is very steady, and advanced rates have been paid, holders now asking still higher prices. This applies also to Peru and Tolu balsams, both of which are held for advanced rates. Jalap is at present very easy, but advanced prices are not unlikely. Colocynth and buchu have been selling privately at steady rates.

In ipecacuanha a steady amount of business has been done, especially in Carthagena root. The opium market is steadier owing to somewhat unfavourable reports as to the crop, and the various opium alkaloids are unchanged. Of the essential oils, advanced prices continue to be paid for star anise, whilst cassia is very steady. Menthol and the various peppermint oils are unaltered. Petroleum has seen advanced prices during the week, but at the close is a quiet market, and quotations are again falling. Cod-liver oil remains very steady, and higher prices may be expected. Shellac is a firm market, and the same applies to quinine, for the best brands of which advanced prices have been paid.

BUCHU.—Sales privately of fair round green leaves have been made at the rate of 3¾d.

CAFFEINE.—High prices have been paid for small parcels in second-hand; whenever obtainable, 25s. to 27s. have been readily paid, and it is doubtful if it could be bought now under 30s.

CAMPHOR (crude).—On the spot there are no offers of either *Japan* or *China*, and nominally quotations remain at 125s. for *Japanese*, with *China* at 112s. 6d. to 115s. For arrival *Japan* offers at 115s. to 120s. c.i.f., and *China* at 100s. to 102s. 6d. c.i.f., both April to June shipment. From *China*, a brisk market is reported, with steadily advancing prices, 108s. c.i.f. being the present quotation.

CAMPOR (REFINED).—Unchanged, and quotations still remain at 1s. 5½d. for *bells and flowers* for 10 cwt. lots, with squares at proportionate rates.

CASCARA.—Fair quality bark offers privately at 18s. to 20s.

CLOVES.—Quiet but steady. For delivery June to August Zanzibar has been selling fairly well at 2½d.

COCA LEAVES.—Rather scarce. A parcel of fine Ceylon leaves will be offered at the next drug sales.

COCAINE.—The price has again been reduced by the manufacturers, the current quotations now being as follows:—For 100 ozs. or more, 18s. 3d.; from 25 to 100 ozs., 18s. 6d.; for lots under 25 ozs., 18s. 9d. These quotations are for Cocaine in tins; 1-oz. bottles are charged 3d. per oz. more.

CODEINE.—Remains quiet at last week's rates of 10s. 9d. to 11s. 3d. according to quantity and brand.

COLOCYNTH.—Good pale Turkey balls have been selling at the steady rate of 1s. 8d.

COPAIBA.—Advanced and in steady demand. Sales of cloudy to bright *Maranham* have been made at 1s. 8d. to 1s. 9d., and holders are now asking 1s. 10d. whilst forged bright balsam, of *Para* character, 1s. 6d. has been paid, and 1s. 7d. is now asked.

IPCACUANHA.—Sales privately have been made at fully steady rates. This especially applies to *Carthagenia* root, of which several serons have been sold at 3s. 7d., at the steady rate of 3s. 7d. for slightly damaged root.

JALAP.—Quiet. Holders are asking 1s., but offers of 11d. would probably be accepted for fair *Vera Cruz*. For arrival it is quoted at 9d. c.i.f.

MENTHOL.—Steady at unaltered rates. Holders ask 15s. 6d. to 16s. on the spot.

MORPHINE.—Remains at the decline noted last week, the quotations being 4s. 5d. for 1000 oz. lots, and 4s. 7d. for smaller wholesale quantities.

OILS (ESSENTIAL).—*Star anise*: Very firm; on the spot sales have been made at 6s. 3d. to 6s. 4d., and as much as 6s. 6d. is now asked. For arrival it is quoted at 6s. 5d., c.i.f. terms. *Cassia*: Remains very firm, and 5s. has been paid during the week for oil containing 70 to 75 per cent. cinnamic aldehyde. For arrival it is firmer, the quotations being 4s. 8d., c.i.f. terms. *Citronella*: Very steady and firmly held. During the week 1s. 1d. to 1s. 1½d. has been readily paid. For arrival it is quoted at 11½d., c.i.f. terms. *Lemon-grass*: Dull of sale at 1½d. *Peppermint*: *H. G. Hotchkiss*' oil is quiet at 9s. 9d. *Japanese* oil containing 40 per cent. of menthol is steady at 8s. 6d., whilst dementholised oil is quiet at 6s. 6d.

OILS (FIXED) AND SPIRITS.—*Linseed* has been a firm market at a marked advance throughout the week, but at the close is a trifle easier, the quotations being £20 2s. 6d. to £20 5s. in barrels on the spot. *Cotton*: Rather firmer. Refined oil is now worth £18 to £19, according to brand. *Coco nut*: Quiet, on the spot. *Ceylon* is still quoted at £23 with *Cochin* at £25, and *Mauritius* at £23. *Rape*: Very firm. Refined oil is still worth £22 10s. *Turpentine*: In poor demand. *American* spirit is now worth 22s. 3d. on the spot. *Petroleum* has been an excited market throughout the week, every day and almost every hour bringing changes. At the close, however, it is a quiet market, and *American* oil is quoted on the spot at 8½d. to 9d. *Water White* at 10d. to 10½d., and *Russian* 8½d. to 8½d.

OIL (COD-LIVER).—The spot quotations for finest non-congealing new oil still average 140s. per barrel of 25 gallons, and there is a firm tone in the market at this rate.

OPUM.—There is a decidedly firmer feeling in the market, owing to unfavourable reports as to the crops. Quotations are:—*Turkey*, soft shipping descriptions 11s. 9d. to 12s., best druggists' 10s. to 10s. 6d., seconds ditto, 9s. to 9s. 6d. *Persian*, steady at 11s. to 12s.

ORANGE PEEL.—Privately, fine cut bright *Malta strips* offer at 9d. to 10d., with 4d. to 5d. asked for coarse-cut dark *rings*.

PERU (BALSAM).—Is still firmly held at advanced rates. Sales have been made on the basis of 9s. 3d. to 9s. 6d. c.i.f. terms, and 10s. is in some cases asked.

QUININE.—Very steady, although no sales of importance have taken place. *H. B.* is quoted at 11½d. to 1s., with *B. & S.* at 12d. to 12½d.

SALICIN.—Is very steady at unaltered rates, makers' quotations being 8s. per 1 cwt. lots, with 28 lbs. at 8s. 6d.

SENEGA.—Fair root has sold privately at the steady rate of 1s. 6d.

SHELLAC.—Extremely firm, and holders are very reluctant to part, except at higher prices. Small sales privately of *Second Orange*, on a basis of 109s. for reddish *TN.* At the auctions *A. C. Garnet* sold at 108s. for good cake qualities, ordinary *Seconds* *Buttons* at 106s. to 109s.

SOY.—The market continues firm, and small sales of fair China have been made at 1s.

TOLU (BALSAM).—Steady. Some business has been done at the rate of 1s. 1½d. to 1s. 2d., but to no great extent, as holders are not very anxious to sell at these rates, and as much as 1s. 3d. is asked.

WAX (JAPAN).—In steady demand at 25s. to 27s. on the spot for good squares. For arrival April to May shipment it is quoted at 25s. 6d., c.i.f. terms.

Late News.

ELECTRICITY FOR HEATING AND COOKING.—Mr. R. E. Crompton, President of the Institution of Electrical Engineers, read a paper on April 24 on "The Use of Electricity for Heating and Cooking" at a meeting of the Society of Arts, which was held in the rooms of the society, John Street, Adelphi. Mr. W. H. Preece was in the chair. Mr. Crompton said that up to the present time the utilisation of electrical energy for the purpose of heating and cooking had been regarded by the public, and even by many who had technical knowledge, as impracticable and too costly; but that so far from this being the case, heating and cooking by electricity had really advanced to a highly useful and practical stage. Having described minutely the manner in which the heat was generated and the various inventions which were necessary before the result could be attained, Mr. Crompton dealt with the subject of expense. The first idea, even of a skilled engineer, would be that the process would be too expensive, but those opinions were based on an insufficient knowledge of the economy—or rather extraordinary want of economy—in cooking as carried on at present by the ordinary kitchen grate. It is not too much to say that in many kitchens not more than 2 per cent. of the heat units of the coal burnt was utilised for cooking purposes, while with a properly arranged grill, heated by electric means, fully 65 per cent. of the heat energy was utilised in the meat. Mr. Crompton concluded by expressing the opinion that there was no reason why in a few years to come quite a majority of the users of electric light should not do all cooking operations of the nature of roasting, stewing, and frying by electrical means. The paper was illustrated by means of the various instruments used for generating the heat, and of cooking utensils, many of which were in actual use, including sauce-pans, frying-pans, and an oven.—*Daily News.*

THE ROYAL COMMISSION ON TUBERCULOSIS.—The *British Medical Journal* publishes a summary of the report of this Commission as follows:—The Commission was appointed in July, 1890, to inquire into "The Effect of Food Derived from Tuberculous Animals on Human Health." The two main lines of inquiry were to determine (1) the circumstances under which the meat and milk of tuberculous bovines were liable to convey tuberculosis to those who consumed these articles of food, and (2) how far ordinary processes of cooking could be proved to render innocuous meat and milk, proved under the first head to be dangerous. The Commissioners point out that the danger is a very real one. They say that "the actual amount of tuberculous disease among certain classes of food animals is so large as to afford to man frequent occasions for contracting tuberculous disease through his food. As

to the proportion of tuberculosis acquired by man through his food or through other means, we can form no definite opinion, but we think it probable that an appreciable part of the tuberculosis that affects man is obtained through his food. The recognition of tuberculous disease during the life of an animal is not wholly unattended with difficulty. Happily, however, it can, in most cases, be detected with certainty in the udders of milch cows. Provided every part that is the seat of tuberculous matter be avoided and destroyed, and provided care be taken to save from contamination by such matter the actual meat substance of a tuberculous animal, a great deal of meat from animals affected by tuberculosis may be eaten without risk to the consumer." The following are the final conclusions of the Commissioners: "Ordinary processes of cooking applied to meat which has got contaminated on its surface are probably sufficient to destroy the harmful quality. They would not avail to render wholesome any piece of meat that contained tuberculous matter in its deeper parts. In regard to milk, we are aware of the preference by English people for drinking cows' milk raw, a practice attended by danger, on account of possible contamination by pathogenic organisms. The boiling of milk even for a moment would probably be sufficient to remove the very dangerous quality of tuberculous milk." Heat does not penetrate a joint as ordinarily cooked, but it is obvious that the more thoroughly it is done through the less chance is there of contamination. As to milk, which is credited not only with a good deal of tuberculosis, but with half the scarlet fever that exists, there seems to be a simple and easy mode of procuring absolute safety. All milk used in the family should be boiled, or should be brought to within a dozen degrees of boiling point. If this were universally done a large amount of disease would be stopped at once.

SALE OF EMBROCATION WITHOUT MEDICINE STAMP.—On April 23, at Liverpool, John Kirby Pilkington, veterinary surgeon, Fox Street, was summoned by the Inland Revenue authorities for selling a medicine for human use without having a revenue stamp affixed to the bottle. It was stated that the defendant sold embrocations for the use of animals and human beings, both being almost of the same consistency. The embrocation bottles for human use were stamped, but the other embrocation, which, it was stated, was frequently bought by human beings for personal application, was not stamped. A fine of 40s. and costs was inflicted.

THE SALE OF POISONS.—The feelings of the *Newcastle Daily Leader* appear to be hurt, if one may judge from the following effusion in its issue of the 23rd inst., which refers to the case reported on page 954 of this week's Journal:—"The Pharmaceutical Society of Great Britain has been playing the great grandmother to some purpose for some time, and there was an illustration of it at Newcastle County Court yesterday. A chemist's apprentice was fined £5 for selling a bottle of chlorodyne which contains a little poison, in the belief that it was a patent medicine. Whether he might have sold it safely if it had been what he thought it was does not appear, and probably is not known, so mysterious are windings of the law and of practice. The offence seems to have been a purely technical one. The sale of poisons has been so hedged round with restrictions in response to the clamour which arises when some poor creature succeeds in poisoning himself with too much ease that the life of a chemist is made a misery to him. And the satire of the whole business is that the poisoning of oneself is as easy as lying."

ROYAL BOTANIC SOCIETY.—The Second Spring Show at the Gardens of the Royal Botanic Society last Wednesday if possible beat the record; the weather being propitious, the visitors numerous, and the flowers so exceptionally beautiful, that it would be invidious to draw comparisons. A charming group of azaleas was exhibited by Barrett, gardener to Mrs. Thornton. The queen of flowers was represented in various colours and new forms. Charles Turner's auriculas were the most remarkable for variety of colour. Orchids, begonias, daffodils, and everlasting flowers were all well represented. A magnificent white rhododendron, in Veitch's group, was especially remarkable, but it is out of the range of possibility to do justice to all the growers.

PHARMACEUTICAL ENTERPRISE IN NEW YORK.—In connection with the annual meeting of the National Wholesale Druggists' Association, held at New York last October, the publishers of the *Pharmaceutical Era* have just issued a large engraving containing the portraits of nearly two hundred members who attended the meeting. The engraving measures some 3 feet long and over 2 feet wide, and is a very creditable production.

THE LATE ROBERT FITCH.—The *Athenaeum* says that Mr. Robert Fitch, F.S.A., who died at his residence, Woodlands, in the suburbs of Norwich, on Thursday, the 4th inst., was a good instance of a man who made a reputation for himself as an antiquary and geologist by his own sagacity and force of character without any of those social or educational advantages which are regarded as necessary conditions of success in life. Born at Ipswich, October 21, 1802, he was sent to the grammar school of his native town, where he acquired a smattering of Latin and Greek, and was apprenticed to his brother, a chemist and druggist in a small way of business in the town. After serving his time he became an assistant for a few years in a shop in London, and in 1827 removed thence to Norwich, where he entered into partnership with his brother-in-law, Mr. Chambers, and where for the next sixty years he continued to serve behind the counter with the utmost regularity till some five or six years ago, when his health began to break down. To the last he might be seen any day wearing his large white apron and waiting on his customers as if he had no other thought than about small gains. Yet as early as 1844 he had been elected a Fellow of the Geological Society, and was already known as a vigilant and accomplished collector of local antiquities with a remarkably quick eye and a sound judgment. When the Norfolk and Norwich Archaeological Society was founded in 1845 Mr. Fitch was one of the original members. In 1849 he was elected a member of the committee, he became honorary secretary in 1859, and treasurer in 1872. This latter office he continued to discharge till five years ago. His collections were chiefly confined to objects of local interest, but they were very varied. He was one of the first who took a lively interest in the flint implements of the drift, and some of his best specimens have figured more than once in works upon the antiquity of man. His collection of mediæval rings and seals, every one of which was picked up in the neighbourhood of Norwich, is large and valuable. He was in frequent communication with some of the most eminent men of science and antiquaries. In 1868 he was appointed a magistrate for the city of Norwich, and at the time of his death was the oldest magistrate on the bench. In 1867 he served the office of sheriff. He discharged the office of honorary curator of the Museum, and drew up a catalogue of the antiquities gathered together there. In 1892, when he was compelled by advancing years to retire from business, he executed a deed of gift by which he presented his antiquarian and geological collections to the Norwich Museum, taking upon himself the whole expense of providing suitable cases, in which they are preserved and exhibited to the best advantage of visitors, and he directed that these should be kept together in a room adapted for their reception and be called the "Fitch Collection."

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words including name and address, are inserted free, but must not partake of the nature of ordinary advertisements.]

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

Books.—'Prantl and Vine's Botany,' 'Ganot's Philosophy,' 'Will's Analysis and Materia Medica,' Attfield and other Major books, latest editions. Condition and price to Floyd, Chemist, Haverhill.

'BRITISH MEDICAL JOURNAL' for January 6, 1894. Full price will be given. *Pharmaceutical Journal* office, 17, Bloomsbury Square, W.C.

OFFERED.

'JOURNAL OF THE ROYAL AGRICULTURAL SOCIETY, ENGLAND.'—Six well-bound volumes, containing numerous prize essays on culture, drainage, crops, cattle (insects, numerous plates). Price 24s. Lecturer's opportunity.—Neale, Chemist, Alfreton.

Books.—'The Diseases of Women' by Dr. Graily Hewitt, 3rd Ed., 10s. 6d.; Allingham's 'Diseases of the Rectum,' 7s. Both contain numerous engravings, and as new.—J. Allen, Chemist, Plymouth.

Company Business.

PRITCHARDS, LIMITED.—This company was registered with a capital of £5000 in £1 shares to carry on the business of dispensing and family chemists, wholesale druggists and drysalters, manufacturers and packers of druggists' sundries and proprietary articles, sauce and pickle manufacturers, etc., also to enter into an agreement with John Pritchard, of 71 and 73, High Street, Cheadle, Cheshire. The first subscribers (who each take 1 share) are:—J. Pritchard, chemist and druggist, J. G. Pritchard, manager, Mrs. M. A. Pritchard, Miss M. M. Pritchard, W. Pritchard, clerk, Mrs. J. E. H. Pritchard, H. B. Tierney, Mrs. J. A. Tierney.

EDWARD ASPINALL, LIMITED.—Registered with a capital of £15,000 in £1 shares. Object, to acquire the business of a manufacturer of cosmetics, soaps, and other proprietary articles as now carried on by H. E. Aspinall, and to develop and extend the same.

HOMOCEA COMPANY, LIMITED.—This company invites subscriptions at par for £19,800 of 6 per cent. debenture stock, being the balance of an issue of £25,000, of which £5200 has been already subscribed. The company was established in February last, and the debenture stock is now issued in order to provide funds for paying off of a charge of £5000, and for extending and developing the business of the company.

Late Advertisements.

Business for Disposal.

DRUGGISTS' Sundries.—The Exors. of late George Scriven, Brierley Hill, are prepared to open negotiations for Disposal, as a going concern, of Medical Glass and Sundries BUSINESS and Goodwill; established 1856; only about £2,000 capital required. Apply, by letter in first instance, to G. SCRIVEN, Chartered Accountant, Victoria St., Nottingham.

Assistants Wanted.

ASSISTANT and APPRENTICE wanted.—In-door Assistant (qualified preferred), age about 23, for permanent situation. State full particulars, salary required, also enclose photograph (if convenient) which will be returned. Wanted also an Apprentice a well-educated youth, about 16, who has passed the Preliminary Examination. Comfortable home. GORDELIER, Chemist, Sittingbourne.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, APRIL 27.

Pharmaceutical Cricket Club v. *Crown C.C.*, at Ealing. Train from Paddington at 1.50 p.m.

MONDAY, APRIL 29.

Society of Arts (Cantor Lectures), at 8 p.m.
"Recent American Methods and Appliances Employed in the Metallurgy of Copper, Lead, Gold, and Silver" (Second Lecture), by James Douglass.

TUESDAY, APRIL 30.

Royal Institution of Great Britain, at 3 p.m.
"Alternating and Interrupted Electric Currents" (Second Lecture), by Prof. George Forbes.
Institution of Civil Engineers, at 8 p.m.
Ordinary Meeting.

WEDNESDAY, MAY 1.

Royal Institution of Great Britain, at 5 p.m.
Annual Meeting.
Royal Society.
Soirée.
Society of Arts, at 8 p.m.
"Deviations of the Compass," by Prof. A. W. Reinold.
Edinburgh Pharmacy Athletic Club, at 9.15 p.m.
Annual General Meeting.

THURSDAY, MAY 2.

Royal Institution of Great Britain, at 3 p.m.
"The Liquefaction of Gases" (Second Lecture), by Prof. Dewar.
Chemists' Assistants' Association, at 8.30 p.m.
Annual General Meeting.

Linnean Society of London, at 8 p.m.
"The Distribution of Plants on the Southern Side of the Alps," by the late John Ball, with an Introduction by W. T. Thiselton Dyer.
School of Pharmacy Students' Association, at 7 p.m.
"Michael Faraday," by B. Jealons.
"Report on Botany," by E. Goulding.

FRIDAY, MAY 3.

Royal Institution of Great Britain, at 9 p.m.
"The Structure and Function of the Horse's Foot," by Vet. Captain F. Smith.
Edinburgh Chemists', Assistants', and Apprentices' Association, at 9.15 p.m.
"Dispensing Notes," by William F. Hay.
"Ergot," by John Harris Burns.

SATURDAY, MAY 4.

Royal Institution of Great Britain, at 3 p.m.
"Music and Musical Instruments of the 16th, 17th, and 18th Centuries," with illustrations on original instruments (Second Lecture), by Arnold Dolmetsch.

Personal and Trade Notes.

The Liquor Carnis Company, advertising to the subject of the purchase of their business and patents by the managing director, Mr. Shepperson, in August last year, the legal formalities in connection with which transfer have now been concluded, write to say that, of course, the business remains in precisely the same condition it was before the purchase, with the same title, the same offices and manufactory, the same management, and the same staff.

Mr. John Buchanan, chemist and druggist, of Callen, N.B., has removed to 71, High St., Leven, having purchased the business of Mr. Robert Johnston, chemist and druggist. Mr. Buchanan had resided in Callen for eleven years and had gained during that time great respect. He had for the last few years held official civic positions in the burgh, first as Councillor, then as Dean, then as Junior Bailie, and latterly as Senior Bailie.

At a meeting of the Crickhowell Board of Guardians held on the 8th inst., Mr. J. P. Hughes, of Abercarn and Crickhowell, was appointed dispenser and drug contractor to the Crickhowell Union for the next six months. At a meeting of the District Council held on the same date, Mr. Hughes was also appointed, conjointly with Mr. Harris, to supply the council with disinfectants.

SUPPLEMENT

TO THE

Pharmaceutical Journal and Transactions.

LONDON, MAY 4, 1895.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, MAY 2, 1895.

There have been but few changes in the chemical market since our last report. Cream of tartar continues a very firm market, and advanced prices have been paid; whilst tartaric acid has been selling at fully steady rates. Sulphate of ammonia is still very flat, and has again declined in price. Copper sulphate is rather firmer. Fuller details will be found below:—

ACID CITRIC—Has been in fair demand throughout the week at previous quotations. It is still worth 1s. 1½d. to 1s. 2d., according to quality.

ACID OXALIC—Has been in fair demand at steady rates. Manufacturers still quote at 3½d. net, ex rails.

ACID TARTARIC—The tone of the market continues very firm, although no further advance has taken place. At the close, foreign makes of acid, both in powder and crystals, are quoted at 10½d., whilst English brands are worth 10½d.

AMMONIA SALTS—A flat market generally, and although the sulphate is the only compound which has declined in price during the week, a general reduction is not improbable. Carbonate: Remains dull of sale at 8½d. to 3½d. Liquor: Unchanged at 3d. to 8½d. Muriate: Quiet at the nominal rates of 39s. for first quality, with 37s. asked for seconds. Sulphate: Continues to fall in price, and grey 24 per cent. is now quoted at 29 10s.

ASHES—There has been a steady sale for both American and pots; quotations being, however, unchanged, the former being still worth 40s., with pots at 23s.

ARSENIC—No change is to be noted, and best powdered white is still worth 15s.

BENZOLE—Fifty per cent. is easier, and is now quoted at 1s., whilst 90 per cent. is fairly steady at 1s. 1d.

BLEACHING POWDER—Has been in good demand at fully steady rates. On the spot from 27 to 27 10s. has been paid, whilst in Liverpool it is quoted at 27 to 27 5s. f.o.b. or on rails.

BORAX—No change has occurred, and Convention prices are maintained at 20s. for crystals, and 21s. for powder. Second-hand holders continue to offer at 1s. to 1s. 6d. less.

COPPER SULPHATE—A fair amount of business has been done at steady rates, especially in the better brands, but the improvement is only likely to be temporary. It is quoted at 214 15s. to 215 10s., according to brand.

CREAM OF TARTAR—The market continues exceedingly firm, and business has been brisk at an advance of 1s. on last week's rates. German powder is now worth 69s. on the spot, whilst 67s. has been paid for the best white French crystals.

MERCURIALS—Quotations remain unchanged at the advance notified last week, Calomel being worth 2s. 10d.; red precipitate, 8s. 1d.; white ditto, 8s. 1d., and corrosive sublimate, 2s. 6d.

POTASH SALTS—Unchanged, the market being quiet. Bichromate is steady at 4½d. to 4½d. Chlorate, quiet at 4½d. in London, whilst in Liverpool it is quoted at 4½d.

to 4½d. f.o.b. Permanganate unchanged, small crystals offering at 52s. 6d. to 55s. Prussiate, fairly steady at 9d. to 9½d.

QUICKSILVER—Unaltered. Importers maintain the price at 27, whilst second-hand holders offer at 26 18s. 6d.

SALTPETRE—A steady market. Bengal is firm at the unaltered rate of 17s. 9d. for 8½ to 5 per cent. on the spot, whilst for arrival, May to June, sales have been made at 17s. 3d. British refined is still worth 22s. 6d. to 23s. 6d.

SODA COMPOUNDS—Generally quiet and unaltered. Bicarbonate, 27 5s. (London). Caustic 70 per cent., unchanged at 28, whilst Caustic 60 per cent. is worth 21 less. Crystals steady at 38s. Hyposulphite, 26 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, MAY 2, 1895.

The amount of goods offered at to-day's sales was so large that a postponement until to-morrow was necessitated in order to complete them. Details of the various articles are given below:—

ACACIA—A fair amount was offered, but met with no demand. Turkey sorts were bought in at 65s., and picked white gum at 29.

ALOES—Only a small quantity was offered to-day, and was all bought in at the following rates:—East Indian (Soco trine) at 70s. to 75s. for fair, soft brown of good aroma, and Curaçao at 45s. for fair brown.

AMBERGRIS—One tin was sold to-day at 60s. per oz. for ordinary grey of fair aroma.

AMMONIACUM—None was sold to-day. A parcel consisting of 57 cases was bought in at rates ranging from 52s. 6d. for good bold, partly mixed, down to 27s. 6d. for small white gum mixed with seeds.

ANISEED—Thirty bags Spanish was bought in at 33s.

ANNATTO SEEDS—Remains quiet. Twenty bags fair bright Madras seed were bought in at 8½d. to 4d.

ARECA NUTS—Out of a parcel of 44 bags, 1 sold at 10s., the remainder being bought in at 12s. 6d.

ASAFOETIDA—A large amount was again catalogued, amounting to nearly 660 cases. Out of the first lot consisting of 193 cases, one only sold at 65s. for good pinkish block, rather earthy and soft.

BENZOIN—Largely offered to-day. The best qualities of Siamese gum sold at 221 for fine hard pale loose almonds; 28 2s. 6d. to 28 5s. was paid for small drop, partly blocky, and 45s. common grey and brown siftings. Bold, fine hard pale gum was bought in at 228. Penang: Ten cases of glassy seconds sold at 77s. 6d. Sumatra met with good demand, and 28 5s. was paid for good seconds, fairly packed; 26 15s. for medium seconds, false packed sides: 6 cases of dull thirds, with fair centres sold at 80s. to 82s. 6d.

BUCHU—The supply to-day was only small, when 10 packages were offered, all of which were sold at the steady rate of 8½d. for good round green leaves, somewhat stalky.

CAFFEINE—Sales of small parcels have been made at the rate of 25s. to 27s., always in second-hand, and it is readily bought up whenever obtainable. For delivery, July to August, it is selling at 23s. to 24s.; also in second-hand.

CALUMBA ROOT—Entirely neglected. Brownish sorts, rather wormy, were bought in at 11s., the remainder, consisting of fair yellow, was bought in at 30s.

CAMPHOR—After fluctuating considerably earlier in the week, the market in crude China is very firm at steadily advancing rates, but business is somewhat limited owing to the firmness of holders. Spot sales are mostly confined to China for which 117s. 6d. has been

paid, 116s. having been bid and refused. For Japan there are no offers, and quotations remain nominally at 125s. For arrival sales in China have been made at 110s. to 112s. 6d. c.i.f. April to June steamer.

CAMPBOR (REFINED).—Quotations still remain unaltered at 1s. 5½d. for bells and flowers in 10 cwt. lots, with squares at proportionate rates.

CANNABIS INDICA.—Twenty-three Robbins were offered. Of these ten sold at 2½d. for fairish green, stalky tops, the remainder being bought in at 3d.

CANTHARIDES.—Five cases of medium Chinese flies were bought in at 11d. to 1s.

CARAMEL.—Ten kegs were bought in at 15s. per cwt. **CARDAMOMS.** Largely offered to-day, and met with a fair demand. The prices obtained were as follows:—*Ceylon-Mysore*: Medium to bold pale plump 2s. 10d. to 3s. 8d.; fair sized pale to medium ditto 2s. 2d. to 2s. 8d.; small to medium white 2s. to 2s. 2d.; dull and split, 1s. to 1s. 6d. *Seeds* were in good demand at 1s. 9d. to 2s. *Ceylon-Malaba*, small to medium sold at the steady rate of 1s. 5d. to 1s. 8d.

CASCARA SAGRADA.—One hundred and twenty-five bales were offered to-day, but were all bought in at from 18s. 6d. to 20s. for fair quality bark.

CASCARILLA.—In moderate supply only; 10 bales of small silvery quills were bought in at 55s., and 20 barrels of siftings at 80s.

CASSIA FISTULA.—Thirty packages of medium size sold at 19s.

CINCHONA.—A moderate amount was offered to-day, and South American *Calisaya* was bought in at 9d. to 1s. *Red bark* at 4s. *Java* at 1s. and *Maracaibo* at 1s. 2d. A parcel of 48 serons of *Crown bark* met with a good demand at 7½d. to 11½d. with 5d. to 6d. paid for first class damaged.

COCAINE.—Remains at the reduction noted last week, quotations being still as follows:—For 100 ozs. or more, 18s. 3d.; from 25 to 100 ozs., 18s. 6d.; for lots under 25 ozs., 18s. 9d., for Cocaine in tins, 1-oz. bottles being charged 3d. per oz. more.

CODEINE.—There has been no further reduction, and quotations remain at 10s. 9d. to 11s. 3d., according to quality and brand.

COLOCYNTH.—In very moderate supply, and the scarcity continues. 4 cases of small broken *Spanish* were bought in at 10d. to 1s.

COPAIBA BALSAM.—At to-day's sales 3 casks bright *Maranham* were bought in at 1s. 9d. to 1s. 10d., and 9 cases of *Bahia* at 1s. 6d.

CORIANDER SEED.—*East Indian* seed continues plentiful; to-day 97 bags were bought in at 11d.

CUBEBS.—The supplies are only moderate, and it was all bought in. *Good berries* from Singapore are held at 52s. 6d. to 55s.; medium ditto for 46s.; and mouldy stalks and dust for 20s.

DRAGONS BLOOD.—The supply was only moderate. One case of *Singapore* was sold at £7 for fine lumpy, and the remainder was bought in at £5 10s. for dull hard sources, to £10 10s. for bold gum of good fracture.

ERGOT OF RYE.—At auction to-day all the *Spanish* offered was bought in at 8½d.

GALLS.—*Turkey* were in fair supply, and a moderate amount were sold at 40s. to 45s. Two cases of *white galls* sold without reserve at 25s.

GAMBOGE.—In good demand. Ordinary gum dull, and partly blocky sold at £8 5s. to £9.

GUAIAECUM GUM.—Bought in at 3s.

HONEY.—*Jamaica* met with fair demand at 20s. 6d. to 27s. 6d. *Australian* was all bought in at 21s. to 28s., whilst choice *New Zealand* was bought in at 40s.

IPECACUANHA.—A few bales of *Carthagena* (Brazilian) root sold to-day at 3s. to 3s. 2d. for ordinary damaged root, the remainder was bought in at 3s. to 3s. 6d.

JABORANDI.—Seven bales of very mixed leaves, with a large amount of stalk, were sold without reserve at 1½d. to 2½d.

JALAP.—A parcel of eighty-two bags sold freely at very low rates from 6½d. to 9d., according to quality and condition.

KOLA.—A small quantity of fair quality *West Indian* were sold at 1s. 6d. The remainder was all bought in at 1s. 4d. to 2s.

LIQUORICE ROOT.—Fifteen bales unpeeled *Persian* root sold at 5s., the remainder was bought in.

MENTHOL.—Remains very firm, and on the spot 16s. is asked for good white dry crystals.

MORPHINE.—Remains quiet at unchanged rates, 1000 ozs. quantities being quoted at 4s. 5d. and 4s. 7d. for smaller wholesale quantities.

MYRRH GUM.—An average amount was offered to-day, when 5 bales of ordinary to very good *pickings* sold without reserve at 22s. 6d. to 38s. Good native picked gum was worth 90s.; good sorts, 55s. to 60s.

OILS (Essential).—*Star Anise*: very firm, and 6s. 5d. has been paid during the week, 6s. 6d. being now in many cases asked. For arrival, the market is firmer, and although 6s. 5d., c.i.f., continues to be the quotation, this will probably be further advanced. *Bay leaf*: one case *Dodge* and *Oldcott's* oil was bought in at 10s. *Bergamot*: 4 cases were bought in to-day at 2s. 9d. *Cassia*: Remains very steady, and 5s. continues to be paid on the spot for oil containing 70 to 75 per cent. cinnamic aldehyde. For arrival it is again firmer, and is now quoted at 4s. 9d. c.i.f. *Citronella*: Remains firmly held at 1s. 2d., at which rate sales have been made on the spot. For arrival it is quoted at 1s. 1d. to 1s. 1½d. c.i.f. *Clove*: *English* oil remains dull of sale at 2s. 3d. to 2s. 4d. *Eucalyptus*: 16 cases were bought in to-day at 1s. 9d. 16 cases *Patent Brand* were also bought in.

Lemon. Four doupers sold without reserve at 9d. *Lemon Grass* continues dull of sale at 1½d. *Lime*. Five cases bought in at 5s. *Nutmeg*, bought in to-day at 3s. *Peppermint*, *H. C. Hotchkiss'* oil is quiet at 1s. 6d. to 1s. 9d. nominally. *Japanese* oil containing 40 per cent. of menthol is fairly steady at 8s. 6d., whilst *dementholised* oil is unchanged at 6s. 6d. *Rose*, sold to-day at 1½d. and settlings at 1d.

OILS (FIXED) AND SPIRITS.—*Cod Liver*: Finest non-congealing new oil continues to be quoted at 140s. per barrel of 25 gallons. Twenty-five barrels of *Newfoundland* oil were bought in to-day at 4s. per gallon. *Cotton* remains steady at unchanged rates, the quotations for refined oil being still £18 to £19, according to brand. *Cocunut*: Quiet. On the spot *Ceylon* is still worth £23; *Cochin*, £24 15s. to £25; *Mauritius*, £23 nominally. *Linseed*: A steady market, both on the spot and for delivery. The spot quotation for barrels remains at £20 2s. 6d. to £20 5s. *Rape* steady, refined oil being still worth £22 10s. *Turpentine* slow of sale. *American* spirit on the spot is now quoted at 22s. to 23s. *Petroleum*: In contrast to the recent boom the market is now quite sluggish, and *American* oil is quoted at 8d.; *water white* at 9d., with *Russia* at 7½d. *Petroleum spirit*: *American* 7½d. to 7¾d.; *deodorised*, 8d. to 8½d.

OPIMUM.—The demand for good quality *Persian* continues, and 12s. has been paid during the week for fine quality. For other varieties, prices remain practically unchanged. *Turkey*:—*Soft Shipping* descriptions 11s. 9d. to 12s., whilst *Druggists* opium is nominally quoted at 10s. to 10s. 6d. for good qualities, with seconds at 9s. to 9s. 6d., but there are no enquiries.

ORRIS ROOT.—Firmly held. To-day best selected *Florentine* was bought in at 80s. to 85s., with sorts at 70s. to 75s.

NUX VOMICA.—In good demand at 5s. 6d. to 6s. per cwt.

QUININE SULPHATE.—Has continued a very firm market. Since last week a large amount of business has been done in the best German makes at advanced rates, the principal item being a sale of 50,000 ounces of *B & S* and *Brunswick*, most of the former, for the Japan market at 1s. For October delivery there are sales of *H.B.* at 11s. ¾d., and *Auerbach* at 1s. ¾d.

RHUBARB (CHINESE).—Bold round *Canton* was bought in at 1s. 2d., flat ditto at 1s. 4d., medium round at 1s. 1d., and medium round *Shensi*, 2s. to 2s. 2d.; pickings, 1s. 3d. A few chests of *Canton* sold at 10d. to 11½d.

SARSAPARILLA.—*Lima Jamaica* sold briskly to-day at 9d. to 10d.

TRACACANTH.—A parcel of 17 bags was offered low, when six were sold for 35s., and one for 26s.

WAX (Bees).—*Jamaica*: Sold at £8 7s. 6d. to £8 10s. *Madagascar*: In good demand at £7 to £7 2s. 6d. *Australian*: Sold steadily at £7 10s. to £7 12s. 6d. *Zanzibar*: £6 17s. 6d. to £7.

Last Week's Gum Sales.

Messrs. G. N. Souratt and Co. report on last week's Gum Sales as follows:—

GUM ARABIC.—At the monthly auction held yesterday, the supply of East Indian kinds brought forward was less than at any previous sale this year, comprising in all 1924 packages (about one-third of which was Persian Insoluble, for which there is at present no demand). The tone of the sales was dull throughout, and in all only 231 packages sold, including 30 cases Ghatti disposed of previous to auctions. Of other descriptions, 401 packages were offered, the bulk of which was bought in, only 33 packages Turkey sorts and 7 bags Australian selling under the hammer. Prices generally show little or no alteration, excepting Turkey sorts, which sold at about 5s. decline.

The assortment consisted of:—

	Offered.	Sold.
Amrad Packages	734	150
Ghatti	333	40
Madras }	78	24
Oomrah }	20	3
Bombay }	107	14
Aden }	655	—
Persian }		
Packages 1924		231
Turkey Packages	213	33
Senegal }	45	—
Barbary }	45	—
Cape }	27	—
Australian }	71	7
Packages 401		40

AMRAD KURRACHEE.—Drop of the better kinds; nothing sold; middling reddish sold at 32s. 6d. Ordinary, 36s.; brownish pea size, 28s. Pickings fair to good, red, 25s. to 27s. 6d.; dark, 22s. Siftings bold pale grains, 30s.; fair palish, 28s. Ordinary dust, 21s.

AMRAD CAWNPORE.—Good palish drop, 33s. to 35s.

AMRAD BROWN.—Fair to good; fair drop, 26s. 6d. to 27s. 6d.

GHATTI.—30 cases sold previous to auctions; 10 cases good pale and amber drop sold at 35s.

OOMRAH.—Fair quality, 32s. 6d.

MADRAS.—Only 3 packages dark pickings; part blocky, sold at 25s.

ADEN.—Picked pale and amber, 46s.; ditto slight, specky, and barky, 40s.; good sorts, 38s.; fair, 36s.; siftings, 22s.

BOMBAY.—One case fair small, 23s.; 2 cases middling, 20s.

PERSIAN INSOLUBLE.—Quite neglected; no bids made.

TURKEY SORTS.—Pale and amber, fair part hard and dusty, 53s. and 54s.; brownish dusty, 47s. 6d.; picked, good, hard, clean cerise, 62s. to 63s.

SENEGAL.—Barbary and Cape all bought in.

AUSTRALIAN.—Seven bags very good pale red frosted, dusty, sold at 32s. 6d.

GUM OLIVANUM.—Seven hundred and sixty-nine cases Bombay offered; 106 cases sold. Drop, good pale (two cases only), 32s. 6d.; garblings, good part blocky, 17s.; fair, 11s.; ordinary, 8s. 9d.; low barky, 4s. 3d. Siftings, fair, 11s. 6d. to 12s.; ordinary, 10s. 6d. Aden sorts, 73 barrels offered; 6 lb. fair dusty sold at 12s.

Late News.

CHEMISTS AND THE EARLY CLOSING BILL.—At the sitting of the Select Committee of the House of Commons on Sir John Lubbock's Shops (Early Closing) Bill, on Wednesday, Mr. A. C. Wootton, editor of the *Chemist and Druggist*, said that Liverpool being one of the three towns selected as most likely to represent the views of the drug trade in the United Kingdom generally on the subject of early closing, voting cards were sent out to 206 firms of chemists and druggists in that city, asking whether they approved or disap-

proved of the principle of the Bill before the committee, a copy of which was also forwarded for their consideration. Of the replies received 106 were in favour of the Bill, ten against it, and three were neutral. The replies from the two other towns, Birmingham and Brighton, were largely in favour of the Bill. He thought the provision permitting drugs to be sold for medicinal purposes after hours would meet any public inconvenience which might otherwise arise.

MIDLAND PHARMACEUTICAL ASSOCIATION.—A meeting of this Association was held at the Mason College on Thursday, the 25th ult.—Mr. Alfred Southall in the chair—when Mr. F. H. Alcock opened a discussion on the "Revision of the Pharmacopoeia." As time, however, did not permit of an adequate consideration of the various points brought forward, it is hoped to resume the discussion at an early date.

Company Business.

THE CHEMISTS' CO-OPERATIVE SOCIETY, LIMITED.—Capital, £200,000 in 100,000 7 per cent. cumulative preference shares, and 100,000 ordinary shares of £1 each. Objects, to carry on the business of wholesale, retail, manufacturing, and export chemists and druggists on the co-operative principle. The company has entered into a contract for acquiring 40 establishments, the net profits which for the last complete year are certified to have amounted to £11,905, and has also agreed to purchase 36 other businesses, subject to the net profits being certified to be not less than £11,000 per annum, and it acquires certain leasehold premises. The purchase price is fixed at £122,500, payable as to £70,000 in cash, and £52,500 in shares at the price of 21s. per share. There are now offered for subscription 75,000 preference and 75,000 ordinary shares at a premium of 1s. per share.

WESTON AND COMPANY, LIMITED.—This company was registered with a capital of £2000, in £1 shares, to carry on the business of chemists, druggists, dyers, patent-medicine and proprietary-article manufacturers and vendors, mineral and aerated-water manufacturers and merchants, etc. The first subscribers (who each take one share) are: C. T. Weston, chemist and druggist, Mrs. C. T. Weston, M. Weston, solicitor, S. Lambert, cashier, T. J. Clarke, chemist and druggist, William Wyles and Albert Wyles, boot-factors. Registered without articles of association.

Personal and Trade Notes.

Dr. W. H. Symons, F.I.C., Examiner of the Pharmaceutical Society, having successfully passed the Apothecaries' Hall, the Royal College of Surgeons, and the M.D. examinations, has also been successful in passing the recent Durham University Examination for the Diploma of Public Health.

The proprietor of the Crystal Palace John Bond's Gold Medal Marking Ink, announces that in future every purchaser of a 1s. bottle will be presented with an improved linen stretcher, in addition to the voucher for a rubber stamp.

The chemical works of Mr. Josiah Hardman at Melton, near Stoke-on-Trent, were on Monday night destroyed by fire. The damage is estimated at over £3000.

Mr. E. A. Holloway, of the London Drug Stores, Fleet Street, Torquay, has taken the premises at 50, Union Street, lately in the hands of Bayliss and Co., and will open them in the course of a few weeks, prior to which a large quantity of Bayliss and Co.'s stock, remaining from the late sale, will be sold by auction.

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words including name and address, are inserted free, but must not partake of the nature of ordinary advertisements.]

WANTED.

PETROLEUM OIL PUMP, with Glass Measure wanted. State price and full particulars to Hulme and Co., Chemists, Oldham.

'BRITISH MEDICAL JOURNAL' for January 6, 1894. Full price will be given.—*Pharmaceutical Journal* office, 17, Bloomsbury Square, W.C.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

BOOK.—Landolt's 'Text-Book on the Polariscopes.'—W. W. Will, 1, St. Agnes Place, S.E.

MICROSCOPIC OBJECTIVE $\frac{1}{4}$ or $\frac{1}{2}$ -inch, by good maker. State lowest price to "Bond," 77, Nether Edge Road, Sheffield.

OFFERED.

PINDAR'S NEW ROTARY PILL COATER AND SIFTER, cost 75s., equal to new; take 30s. cash.—Rudd, Pharmaceutical Chemist, Ripon.

LABEL CABINET.—Hold about 200 varieties, alips, etc. instantly found and taken; nothing to wear up or go wrong; greatest convenience to druggist. £2.—W. Hindle, Chemist, Gorleston, Gt. Yarmouth.

BOOKS.—'The Diseases of Women,' by Dr. Graily Hewitt, 3rd Ed., 10s. 6d.; Allingham's 'Diseases of the Rectum,' 7s. Both contain numerous engravings, and as new.—J. Allen, Chemist, Plymouth.

Terms for Advertisements

IN THE

Pharmaceutical Journal.

Advertisements of Assistants Wanted, Apprenticeships, For Sale, Partnerships, Businesses for Disposal, Businesses Wanted, and Premises to Let are charged as follows:—Fifty words or less, 3s. 6d. Each additional ten words or less, 6d.

Advertisements of a general character are inserted at 4s. 6d. each for seven lines (50 words) or less, and each additional line of seven words, 6d.

Advertisers are requested to observe that late prepaid Advertisements received before 5 p.m. on Thursday of each week, are inserted on the last page of the "Supplement."

All Advertisements, except for the "Exchange" column, must be sent to the Office, 5, Serle Street, W.C., where replies to prepaid Advertisements may be addressed, and will be re-directed free of charge.

Advertisements of Assistants seeking Engagements will be inserted Free of Charge, if not exceeding 20 words (inclusive of address), and if received before 10 a.m. on Thursday.

Postal Orders should be made payable at Lincoln's Inn, W.C., to STREET BROS. Cheques should be crossed "London Joint Stock Bank."

Late Advertisement.

Assistant Wanted.

WANTED at once, a Temporary MANAGER, to take charge for a month or so. Must be qualified, and preference would be given to one who has some knowledge of Postal (not telegraph) duties. W. PUCKEY, 6, Nugent Terr., Abercorn Place, St. John's Wood.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, MAY 4.

School of Pharmacy Students' Association.

Botanising Excursion to Hadley Woods. Leave King's Cross (suburban) for High Barnet at 1.44 p.m.

Pharmaceutical Cricket Club v. Hadley C.C., at High Barnet. Leave King's Cross at 1.44 p.m.

MONDAY, MAY 6.

Society of Arts (Cantor Lectures), at 8 p.m.

"Recent American Methods and Appliances Employed in the Metallurgy of Copper, Lead, Gold, and Silver" (Third Lecture), by James Douglas.

Society of Chemical Industry (London Section), at 8 p.m.

"The use of Hot Air in Drying," by C. C. Hutchinson.

"The Estimation of Alkaline Salts in Fire Clays, Manures, etc.," by A. Cameron.

Royal Institution of Great Britain, at 5 p.m.

General Monthly Meeting.

TUESDAY, MAY 7.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

Royal Institution of Great Britain, at 8 p.m.

"Alternating and Interrupted Electric Currents" (Third Lecture), by Prof. G. Forbes.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

Society of Arts (Applied Art Section), at 4 p.m.

"Recent Improvements in Designing, Colouring, and Manufacture of British Silk," by Thomas Wardle.

WEDNESDAY, MAY 8.

Pharmaceutical Society of Great Britain, at 11 a.m.

Council Meeting.

Geological Society of London, at 8 p.m.

Evening Meeting.

Society of Arts, at 8 p.m.

"The Extraction of the Rarer Metals from their Oxides," by Professor William C. Roberts-Austen.

University College (London) Chemical and Physical Society, at 5 p.m.

Ordinary Meeting.

THURSDAY, MAY 9.

Royal Institution of Great Britain, at 3 p.m.

"The Liquefaction of Gases" (Third Lecture), by Prof. Dewar.

FRIDAY, MAY 10.

Royal Institution of Great Britain, at 9 p.m.

"A Recent Journey in Afghanistan," by the Hon. G. N. Curzon.

Royal Astronomical Society, at 8 p.m.

Ordinary Meeting.

SATURDAY, MAY 11.

Royal Institution of Great Britain, at 3 p.m.

"Music and Musical Instruments of the 16th, 17th, and 18th Centuries" (Third Lecture), by Arnold Dolmetsch.

Geologists' Association (London).

Excursion to Chilworth and Woodhill. Leave Charing Cross (S.E.R.) at 2.5 p.m.

Partnerships Dissolved.

[From the *London Gazette*.]

James Morris and George Morris, carrying on business as Patent Medicine Vendors, at 33, Wharf Street, Leicester, under the style of Morris and Co. Debts will be paid and received by James Morris.

William Sanderson and Ralph Brown Annisson, carrying on business as Wholesale Druggists, Ship Store, General and Provision Merchants, at Sunderland and Cardiff. The business will be carried on by and under the name of Ralph B. Annisson.

Pharmaceutical Journal

SUPPLEMENT.

LONDON, MAY 11, 1895.

Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

A Weekly Record of Pharmacy and Allied Sciences.

The Official Organ of the PHARMACEUTICAL SOCIETY
of GREAT BRITAIN, and the oldest Journal
addressing Chemists and Druggists,
*Circulating in the United Kingdom, France, Germany,
Austria, Italy, Russia, Switzerland, Canada, the
United States, South America, India,
Australasia, South Africa, etc.*

Editorial Office: 17, BLOOMSBURY SQUARE, W.C.

Publishing and Advertising Office, 5, SERLE STREET, W.C.

PUBLISHED WEEKLY, PRICE FOURPENCE.

AN AVERAGE OF 7,000 COPIES PRINTED WEEKLY.

ANNUAL SUBSCRIPTION, INCLUDING POSTAGE, 10s. 6d.

In addition to being the sole periodical publishing full and complete reports of the transactions of the Pharmaceutical Society and of the British Pharmaceutical Conference, the JOURNAL records the proceedings of pharmaceutical and other scientific societies throughout the country, and chronicles all important advances in pharmacy and allied subjects in this country and abroad. Reviews of new scientific and technical works form an important feature in the JOURNAL, and its pages are also open for the discussion of matters of importance to British pharmacists generally, as well as for the purpose of supplying special information desired by subscribers.

The JOURNAL is supplied from the Publishing Office, 5, Serle St., Lincoln's Inn, W.C., post free for twelve months to any address throughout the world, on receipt of remittance for Ten Shillings and Sixpence.

Special Issue of the Journal.

The PHARMACEUTICAL JOURNAL of May 25 will contain a full report of the FIFTY-FOURTH ANNUAL MEETING of the Pharmaceutical Society, the result of the

Election of Council

for the ensuing twelve months, and a Special Report of the Annual Dinner. As this issue will therefore possess a special interest to pharmacists, a copy will be sent to

Every Chemist in Business

in England and Wales, Scotland, and Ireland, whose address can be ascertained. The number of copies sent out on this occasion will exceed

11,000.

Advertisements for the Special Issue should be sent without delay to the Publishing Office,

5, Serle Street, Lincoln's Inn, London, W.C.

Trade Notes.

THE SANITAS COMPANY (LIMITED) entertained some two hundred members of the Sanitary Inspectors' Association at the works at Bethnal Green, on Friday, April 26.

* * * * *

THE LIQUOR CAERNIS Co. announce that many suggestions having been received concerning the size of the neck of their "Malto-Carnis" bottle, which is not considered wide enough, it has been decided to put on the market a distinct and new size to retail at 1s. 9d., the neck of the bottle of which admits of a teaspoon.

Personal Notes.

PROFESSOR HUXLEY, who is but slowly recovering from a severe illness, celebrated the seventieth anniversary of his birthday on Saturday last.

* * * * *

Mr. T. H. W. IDRIS has been appointed a member of the General Purposes Committee of the London County Council.

* * * * *

Mr. Thomas Bateson, of Kendal, who is a candidate for a seat on the Pharmaceutical Council at the pending election, will be remembered as a candidate on two former occasions, when he received a large number of votes.

* * * * *

Mr. A. S. Campkin, of Cambridge, another candidate, occupied the last place on the list at the last election.

* * * * *

Mr. Octavius Corder, of Norwich, appears as a candidate for the first time, having for a number of years served on the Board of Examiners for England and Wales, from which position he retired last year. Mr. Corder was President of the British Pharmaceutical Conference at the Nottingham Meeting in 1893.

* * * * *

Mr. A. L. Savory, of New Bond Street, W., a member of the well-known firm of Savory and Moore, has not formerly accepted nomination for office.

* * * * *

Mr. G. S. V. Wills, of the Westminster College of Pharmacy, stood for election some years ago, but was not returned.

Partnerships Dissolved.

[From the London Gazette.]

Jacob Humphries and George Alexander Weall, Manufacturing and Wholesale Chemists, Druggists, and Drysalers at Adolphus Street, Bradford, under the style of Humphries and Co. Debts will be paid and received by G. A. Weall, who will continue the business on his own account.

* * * * *

William John Goodwin, Harry Orton Goodwin, and Harold Goodwin, formerly carrying on business under the style of the Church Stretton Aërated Water Co.

* * * * *

Kilner Brothers, Glass Bottle Manufacturers at Thornhill Lees and Conisborough, Yorks, and King's Cross, London, so far as regards Tom Kilner.

Modern Pharmaceutical Industries.

THE MANUFACTURE OF CASTOR OIL.

A DESCRIPTION OF MITCHELL'S COLD PROCESS.

The manufacture of castor oil not having been hitherto attempted in this country, it has been thought that some description of the process employed by the British Castor Co., Ltd., would be of interest to readers of the Journal.

The system hitherto in use at the centres of this industry involves, first of all, the separation of the husks from the kernels, which are then heated and moulded into cakes and placed in horsehair bags or cloths and submitted to pressure, which is almost invariably obtained by manual power in India. In Marseilles and other centres of Europe where castor oil is manufactured, hydraulic pressure is usually applied. In the case of East Indian oil, the total oil taken from the seed is usually extracted at one operation; but where hydraulic pressure is employed it is found more economical to press twice, and by this means extract a larger percentage of oil from the seed. The Calcutta marc from castor crushing contains about 20 per cent. of oil, whereas by the other systems it is considerably less than half that amount. This mode of manufacture has many objectionable features, being complicated and unnecessarily expensive, and most injurious as regards the quality of both the oil and the cake so produced.

The system adopted by the British Castor Co., Ltd., at their works, which are situated in Shenton Street, London, S.E., has been introduced by their consulting engineer, who has invented and patented most of the apparatus employed. Guzerat seed is exclusively employed for the preparation, both of the medicinal and the lubricating oils, so as to ensure a uniform product, as it is the only variety which can readily be obtained free from admixture.

The first floor of the building is used as a granary, and here the seed is carefully sifted, so as to get rid of any extraneous matter. It is then shot into a movable hopper, which is drawn along the top of the large horizontal hydraulic press situated on the ground floor. When the press boxes are open the seed is discharged through the aperture at the bottom of the hopper, and fills the boxes. A pressure of 480 tons is then applied, and the oil is expressed, falling upon a movable plate and into drains provided for its reception along each side of the press. From these sources it flows into a linen strainer, which separates the crushed seeds which have escaped from the press, and then into an adjacent tank. Here, when it reaches a certain level, the stopcock of a vacuum pipe in connection is opened, and the oil is immediately drawn through a system of pipes into a cylinder on the first floor in another part of the building, whence it passes down into the first filter, which takes out all mechanical impurities. Thence it is drawn into another cylinder adjacent to the first, one being empty whilst the other is full, and *vice versa*. At this stage it may be noticed that the oil is perfectly clear and bright. However, in order to get rid of microscopical impurities it passes from the second cylinder into a second filter, whence it is drawn into the bottling machine, where, as a final precaution, it is again filtered before being run into the bottle. This apparatus, which has been patented by Mr. Mitchell, is admirably adapted for the purpose, and, as a vacuum is formed in the bottle when the outlet taps are opened, cracked bottles are at once detected. The temperature both of the filling and bottling rooms is kept uniform day and night.

It may here be remarked that the system of filtration is throughout entirely mechanical, no chemicals being employed in any part of the process. In the case of the medicinal oil four separate cloths of a special kind of twill are arranged in each filter. The plant has been erected about four months only, and medicinal oil is expressed during the first half of the week,

the press being afterwards used for the extraction of lubricating oil from the residue; but from the press forward the two varieties of oil pass through distinct and separate systems of pipes and refining plant so as to avoid any possible contact between them. Shortly, however, the two varieties of oil will be made continuously, a separate press being used for each. It may here be noted that the oil expressed by this process is absolutely "cold drawn," the temperature of the press-room averaging 47° F. This is of interest, in view of the fact that very little, if any, of the so-called "cold drawn" castor oil at present in the market is properly so termed. The oil, in all its stages of manufacture, has a simple bland taste, resembling olive or almond oil, in marked contrast to the nauseous taste usually associated with it. The press takes a charge of 2 cwt. of seed at each operation, the time occupied in expressing the medicinal oil being about seventeen minutes. An important feature of this system of vacuum filtration is that from the time the oil leaves the collecting tank until bottled it is never exposed to the air, and the natural moisture of the oil is dissipated mechanically.

After the seed has undergone the first pressure, whereby half of the available 44 per cent. of oil has been collected for medicinal purposes, the residual cake is again submitted to the same treatment. This takes out an additional 18 per cent. of oil, finally leaving about 6 per cent. in the marc. The second product goes through a similar process to the first, except that it is only filtered once, and that three instead of four cloths are employed for the purpose. The finished product, which is sold exclusively for lubricating purposes, as a matter of fact closely resembles the medicinal oil, but has a slightly nauseous taste. The marc left after the second extraction is at present entirely used for horticultural purposes under the name of "Foodite." Analysis shows it to contain 7.28 per cent. of nitrogen, equivalent to 8.84 per cent. of ammonia.

Mr. Mitchell was engaged in the manufacture of castor oil in India for some twelve years, and the process now employed by him embodies all the best points of his experience in the different oil-producing centres. In Calcutta alone there are more than 300 mills engaged in crushing castor oil seed, but the system there employed, as already explained, involves the husking of the seed prior to submitting it to pressure. However, a mill is being erected there in which Mitchell's process has been adopted. The advantages claimed for crushing the whole seed are that the process is much more expeditious, less costly, and that there is no danger of internal pressure, such as is liable to occur when the kernels only are submitted to pressure.

Obviously this system of extraction is applicable to many other seeds besides castor. In fact it has been tried with extremely satisfactory results with linseed. In this instance, after about 27 per cent. of oil had been extracted by cold pressure, the seed was but little altered in appearance, and would doubtless be very useful in that state for cattle food, the expense of making it into cake being unnecessary. Besides this, several purposes for which it could with advantage be used pharmaceutically, suggest themselves. The most important economic use of the seed, however, is as a source of oil, and the extraction of this is clearly and simply demonstrated at the works of the British Castor Co., Ltd.

MICROBES AND FOOD.—Now an editor of a leading medical journal comes out with a note of warning in the use of bread and butter. It seems the germ is there, too. Some years ago we began lopping off articles of diet because the bacteriologist discovered microbes. He kept on discovering, and we kept on lopping, till we got down to bread and butter. Now the last ditch has been reached. The grave dilemma confronted us, lop off more and die, or eat germs. We have begun to eat germs. We find them good diet; our weight is increasing, disease remains in abeyance, and altogether we are out of the woods of lurking dangers and are happy again. We advise our readers to eat germs. Take them for breakfast, get all to be had for dinner, and there is no need of avoiding them at supper.—*Patent Medicines Journal*.

Company Business.

DAVIES AND EVANS, LIMITED.—Registered by Barnard, Regge, and Jupp, 7, St. Mildred's Court, Poultry, E.C., with a capital of £100,000 in £1 shares. Object: to adopt and carry into effect an agreement expressed to be made between J. Brilmayer of the one part and this company of the other part, and generally, to carry on business as oil, colour, and Italian ware-housemen, hardware, wine, spirit and beer merchants, warehousemen, manufacturers of and dealers in aerated and mineral waters, drysalts and picklers, manufacturers of and dealers in china, glass, and earthenware, tea, sugar, coffee, tobacco, jams, preserves, patent medicines, disinfectants, brushes, baskets, bags, etc. The directors are to be elected by the signatories. Qualification, £250. Qualification of subsequent directors, £1000. Remuneration: Chairman, £400 per annum; ordinary directors, £200 per annum each.—*Financial News*.

QUININE BITTERS MANUFACTURING COMPANY, LIMITED.—The Quinine Bitters Manufacturing Company, Limited, Llanelli, have just published their seventh annual report and balance-sheet. From these, it appears that the net profit for the year to March 31 amounts to £1012 13s. 6d., which, together with the balance of £524 10s. 8d., make a total of £1537 4s. 2d. An interim dividend at the rate of 5 per cent. per annum was paid in October, 1894, amounting to £448 18s. 9d., and the interest on calls paid in advance amounted to £65 15s. 3d. From the balance of £1021 10s. 2d., the directors recommend a dividend at the rate of 5 per cent. per annum for the six months ending March 31.

WAKEFIELD'S NATURAL HEALTH MEDICATION COMPANY, LIMITED.—Registered with a capital of £2500 in £1 shares. Object: to enter into an agreement with William Wakefield and J. Lingford, both of Leeds, Yorkshire, for the acquisition of the undertaking of the Psychopathic Dispensary, now carried on at 78, North Street, Leeds, and to carry on the same. Managing director, W. Wakefield. Registered office, 78, North Street, Leeds.

CHARLES MIDGLEY, LIMITED.—Registered with a capital of £2000 in £5 shares. Object, to carry on the business of wholesale and retail chemists and druggists, dentists, etc., at 23, St. Ann's Square, Manchester, or elsewhere. The directors are C. Midgley, F. Murgatroyd, and H. O'Hanlon. Qualification not specified. Remuneration to be fixed by the company.

CROAD AND BROWN, LIMITED.—Registered with a capital of £20,000 in £50 shares. Object: to acquire the business of crushers and grinders of linseed, cottonseed, etc., and as oil, coal, and manure merchants, hitherto carried on at Bridgwater under the style of Croad and Brown, and to develop and extend the same. Registered office: The Docks, Bridgwater, Somersetshire.

FRANZ JOSEF WATER COMPANY, LIMITED.—Registered by John Hart, 22, Great Winchester Street, E.C., with a capital of £5000 in £1 shares. Object: to acquire the business now carried on by Franz Josef Water Co., to acquire mineral springs, to manufacture, sell, and deal in mineral and aerated waters, etc.

MEDICAL HERBALISTS' DEFENCE UNION, LIMITED.—Registered by A. M. Wilson, County Court Chambers,

Bank Street, Sheffield, as a guarantee company, with a membership of 300, each of whom is liable for the sum of £5 in the event of winding up. Objects: To support and protect the character and interests of medical herbalists practising in the United Kingdom, and to promote honourable practice, and devise means whereby the public may be enabled to distinguish between the legitimate practice of medical herbalism and the practices of those who simply trade on its honoured name to its detriment and injury. The control of the business of the company is vested in a council, consisting of a president, three vice-presidents, treasurer, secretary, and a committee of four duly-qualified members of the union, to be elected annually.

MEDICAL ELECTRICAL INSTITUTE.—This company was formed last October to take over the business hitherto carried on by the Medical Battery Company, Limited, which went into liquidation in November, 1893. The capital was agreed at £75,000, of which £50,000 ordinary shares were to be issued as fully paid to the shareholders of the old company, and £25,000 preference shares were to be issued to the creditors of that company. At the meeting of the creditors and contributories now held before Mr. C. J. Stewart, the Official Receiver, no resolution was moved for the appointment of a liquidator, and the matter was left in the hands of the chairman, to be wound up in the usual manner. The accounts filed under the proceedings showed unsecured debts £1363, other liabilities £648, loans on debenture bonds £9440, and preferential claims £186. The assets are valued at £6000, and are covered by the debenture bonds, the deficiency to the creditors being £5630. In reply to a creditor, the chairman said there was no prospect of any dividend being paid on the unsecured claims, which included a sum of £250 in respect of directors fees. Nothing whatever has been received by the directors.

PERRY'S POWDERS, LIMITED.—This company was registered with a capital of £20,000, in £1 shares (£19,900, 10s. per cent. cumulative preference, and 100 founders'), to purchase, or otherwise acquire, the business of Thomas Child, at 82, Wellington Road, Leeds, carried on under the style of "Perry and Company," of making and selling two patent or proprietary medicines, known as "Perry's teething-powders for children" and "Perry's pills," and of a wholesale and retail chemist and druggist and dentist, and also to enter into an agreement with the said Thomas Child.

HALVIVA, LIMITED.—Registered with a capital of £10,000 in £1 shares. Objects: to carry on business as chemists and druggists generally, and to enter into an agreement, made April 22, with J. B. Halcrow, to manufacture and deal in a certain registered medical preparation known as Kreat Halviva. The directors are to be elected by the signatories to the memorandum of association. Remuneration to be fixed by the company.

MORPHINE IN SOOTHING SYRUPS.—Certain preparations (*sic*) known as soothing syrups, run their unfortunate careers apparently with the sole ambition of drawing strong observations from the mouths of coroners and juries, whereas it is plain they should attend wholly and solely to the mouths, etc., of little suffering babies. Hence their misfortune. Not a word can be said here in defence of a soothing syrup containing eight times the quantity of morphine stated, which recently killed a child Worcester. In the case quoted the maker's name did not transpire at the coroner's inquest, but until the contrary is proved, it certainly looks like the work of a clumsy substitutor.—*Patent Medicines Journal*.

1s. 8d. is in some cases asked. *Lemon-grass*: Nominally 1½. *Peppermint*: *H. G. Hotchkiss'* oil is dull of sale at 9s. 6d. *Japanese* oil containing 40 per cent. menthol is steady at 8s. 6d., with *dementholised* at 6s. 6d.

OILS (fixed) AND SPIRITS.—*Linseed*: Very firm, and advanced prices have been paid, the closing quotation being £20 12s. 6d. in barrels on the spot. *Cotton*: Lower; £17 15s. to £18 10s. is the present quotation for refined oil, according to brand. *Coco-nut*, easier. *Ceylon* is quoted at £22 15s., *Cochin* £24 15s., *Mauritius* £23. *Rape*: Firmer. Refined oil is worth £22 10s. to £23 15s. *Turpentine*: Lower and dull of sale. *American* spirit is now worth 21s. 10½d. on the spot. *Petroleum*, quiet. *American* oil is quoted at 6d., *Water white* 8d., and *Russian* 5½d.

OIL (COD-LIVER).—Much firmer, and holders are now asking 150s. to 165s. per barrel of 25 gallons for fine new non-congealing oil.

OPIMUM.—*Persian* continues in good demand, and holders are firm. During the week 12s. 3d. has been paid for good quality. *Turkey* opium remains quiet, *soft shipping* descriptions being quoted nominally at 11s. 9d. to 12s., *best drugsters'*, 10s. to 10s. 6d., *seconds ditto*, 9s. to 9s. 6d.

PERU (BALSAM).—Selling privately 9s. 6d. c.i.f. terms.

QUININE.—Quiet, but steady, and no sales of importance have occurred. *B. & S.* and *Brunswick* are quoted at 1s.

SANTONIN.—The present price is 5s. 4½d. per lb.

SHELLAC.—Sales privately have been but small at steady rates. At the auctions on the 7th inst., no business *A.C.*, with 103s. paid for glassy unworked. *Button*, was done in *Second Orange*. *Garnet* sold at 104s. for worked *Cahey BL* sold at 112s., ordinary ditto, 107s., and *cakey* wide at 103s.

SOY.—Steady. Fair *China* sells at 1s.

TOLU (BALSAM).—Strady. Little business has been done privately, holders asking 1s. 8d. per lb.

LAST WEEK'S DRUG SALES.

The fortnightly drug sales last week being so heavy as to necessitate an adjournment, were completed on Friday, the 8th inst., when the following prices were realised:—

ALOES.—*Curacao*: The moderate amount offered sold freely at fully steady rates. Prices—good bright liver, 41s. to 46s.; dark to fair, part *capey*, 11s. 6d. to 13s. 6d. *Barbados* quiet. Five boxes good liver, more or less *capey*, sold at 49s. *Cape*: Twenty-two cases, fair to good bright, sold at 21s. 6d. to 24s. *Socotrine* was all bought in.

AMMONIACUM.—Nine bags small, slightly blocky, *seedy* gum sold at 29s.

ASAFETIDA.—Dull of sale. Out of a total of 750 cases offered, 85 sold at the following prices:—Fine free medium pale almonds, partly blocky, 92s. 6d.; good hard pinkish, slightly blocky, 80s. to 85s.; ditto somewhat earthy, partly grey and soft, 60s. to 65s.; down to 20s. for low blocky.

BENZONIN on the whole fairly steady, but the prices obtained were irregular. *Siam*. Dull of sale; *sittings* sold at 50s. *Sumatra*, bold pale almondy seconds, sold at £8 15s. to £8 17s. 6d. *Palembang*, very ordinary fourths sold at 19s.

BUCHU.—Very steady, 15 bales of good bright round green leaves, sold at 3½d. to 3½d.

CALUMBA ROOT.—One hundred bags of very ordinary *sorts*, somewhat wormy, sold at 7s. to 7s. 8d.

CANELLA ALBA.—Ten bales of good quality, small to bold bark, sold at 24s.

CARDAMOMS.—Prices were generally somewhat easier, but *seed* sold at steady rates. *Ceylon-Mysore*: Fine medium to bold pale, 2s. 11d. to 8s. 8d.; good medium, 2s. 9d. to 2s. 11d.; medium, dull to pale, 2s. 2d. to 2s. 5d.; small ditto, 1s. 9d. to 1s. 11d., down to 1s. 2d. *Ceylon-*

Malabar: Bold to medium, pale, 1s. 10d.; small to medium, brownish, 1s. 5d. to 1s. 8d., down to 1s. 2d. *Tellicherry*: Fair brown, 1s. 9d. *Seed*, 1s. 11d. to 2s. 1d.

CASCARILLA.—Sixty-four bales of ordinary small brown chips sold at 22s. 6d. to 37s. 6d.

CUTTLEFISH.—Ten casks fair quality sold at 1½d.

DRAGONS BLOOD.—Two cases fair lump, partly dull *Singapore* gum sold at £6 15s.

ELEMI GUM.—In good demand. Thirty-four cases sold at 31s. for good white gum, down to 26s. 6d. for ordinary yellowish and discoloured.

GAMBOGE.—Easier. Seventeen cases sold; medium pipe of fair fracture, partly drossy and slightly damp, at £8 12s. 6d.; dull to bright pickings, £8 5s.

HONEY, Jamaica.—Sold freely at 22s. to 26s., with 19s. paid for dirty, somewhat thick.

IPECACUANHA.—*Rio (New Granada)*, in fair demand and the ordinary grades of root fetched 2d. to 4d. more per lb. than at the last sales. Prices:—Good bold plump 4s. 7d. to 4s. 10d.; fair thin wiry, 4s. to 4s. 5d. *Carthagena (Columbia)*, good light first class damaged, 3s. 2d. down to 2s. 10d. for ordinary third class ditto.

RHUBARB.—Sold at fully steady rates. *Canton*, fair small flat sold at 10d. to 11½d., good small round 11d. to 1s. *High dried* medium, 10d. *Shensi*, medium flat, three fourths pinky fracture, 1s. 10d.

SARSAPARILLA.—*Jamaica*: Pale native sold at 8½d.; damaged, 7d. *Lima Jamaica*: Good bright, second to first class damaged, 8d. to 11½d. *Honduras*, 8½d. to 1s.; fair damaged ditto, 11½d.

SENNA.—Very firm. Good bold green *Tinnirelly* have sold at 3½d. to 5½d.; ordinary to fair yellowish, ½d. to 3½d.

WAX (BEES).—*Jamaica*: Sold at £8 7s. 6d. to £8 15s. for fair to good yellow. *Madagascar*: Very firm. Good bright sold at £7 7s. 6d. to £7 10s.; ordinary dark, £7 to £7 5s. *Australian*: Four cases sold at £7 7s. 6d. to £7 17s. 6d. *Mozambique*: Mixed yellow and grey sold at £6 17s. 6d.

Terms for Subscription to the Pharmaceutical Journal.

The PHARMACEUTICAL JOURNAL circulates amongst Pharmacists in Great Britain and Ireland, France, Germany, Austria, Italy, Russia, Canada, the United States, South America, India, Australasia, South Africa, etc., etc., and is therefore specially adapted for all Advertisements to the Drug Trade at home and abroad. The average number of copies printed weekly is 7,000.

The Annual Subscription, commencing at any time and including postage to any address throughout the world, is 10s. 6d.

For the convenience of subscribers, a table showing the sums payable in Foreign Currencies for one year's subscription (including postage) is appended:—

United States.....	\$2.60	France.....	Fr. 13.25
Canada.....	\$2.60	Switzerland.....	Fr. 13.25
Germany.....	Mks. 11	Belgium.....	Fr. 13.25
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Denmark.....	Kr. 9.60	Spain.....	Pea. 14.00
Russia.....	Rbls. 8.70	Portugal.....	Reis. 3.965

Advertisements and Subscriptions should be addressed to the Publishers, 5, Serle Street, Lincoln's Inn London, W.C. Postal Orders should be made payable at Lincoln's Inn, W.C., to STREET BROTHERS. Cheques should be crossed "London Joint Stock Bank."

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, MAY 9, 1895.

The most important points of interest in the chemical market during the past week are briefly as follows:—Tartaric acid remains very firmly held, whilst the prices of cream of tartar have been further advanced. Sulphate of ammonia has fluctuated somewhat, but at the close is steady, and advanced prices are probable. Full details of prices of interest are given below:—

ACID, CITRIC.—The demand has been fairly steady without any alteration in the quotation. Prices are still s. 1½d. to 1s. 2d., according to quality.

ACID, OXALIC.—Has been selling steadily at the last quotation of 8½d. net ex rails.

ACID, TARTARIC.—A very firm market at fully steady rates. English manufacturers quote at 11d., whilst foreign brands of acid, both in powder and crystals, are worth 10½d. to 11d.

AMMONIA SALTS.—The market generally is steadier, and advanced prices for sulphate are probable. Carbonate unchanged at 3½d. to 3½d. Liquor remains at last week's quotation of 3d. to 3½d. Sal ammoniac quiet at the unaltered rates of 39s. for first quality, with seconds at 37s. sulphate: Earlier in the week it touched £9 7s. 6d., but at the close the market is very firm, and £7 15s. has been bid for grey 24 per cent.

ANTIFERIN.—Still falling, and the current quotation is 10s. 1d. per lb.

ASHES.—Are unaltered. Sales of American have been steady at the steady rate of 40s., with pots at 23s.

ARSENIC.—The scarcity continues, and best powdered bit is still quoted at 15s.

BENZOLE.—Fifty per cent. is unaltered, the quotation being 1s.; 90 per cent. is rather easier at 1s. 0½d. to 1s. 1d.

BLEACHING POWDER.—The steady demand continues at unaltered rates. On the spot the quotation remains at £7 £7 10s., and in Liverpool £7 to £7 5s. f.o.b., or on rails, the price.

BORAX.—A quiet market at unaltered rates. Syndicate prices are 20s. for crystals and 21s. for powder, but in bond hands it offers at 1s. to 1s. 6d. less.

COPPER SULPHATE.—Dull of sale. The best brands are annually quoted at £15 10s., with others at prices ranging upwards from £14 15s.

CREAM OF TARTAR.—A very firm market at advanced rates. German makers have advanced the price of powder from 69s. to 70s. on the spot, whilst 68s. is paid for best white French crystals.

MERCURIALS.—Unaltered. Quantities up to 28 lbs. are quoted at:—Calomel, 2s. 10d.; red precipitate, 8s. 1d.; 2s. ditto, 3s. 1d.; corrosive sublimate, 2s. 6d.

PHOSPHORUS.—Firm. Wedges are quoted at 2s., sticks at 2s. 1d.

POTASH SALTS.—Unaltered. Bichromate: Steady at 4½d. Chlorate: Quiet at 4½. in London; in Liverpool it is firmer, at 4½d., f.o.b. Permanganate: Unaltered, small crystals offering at 52s. 6d. to 58s. Prussiate: Steady at 9d. to 9½d.

SILVER.—Unaltered. Importers' prices remain steady whilst in second hands it offers at £6 18s.

SALTPETRE.—Steady. Bengal 3½ to 5 per cent. is unaltered at 17s. 9d. on the spot, whilst for arrival May to June, sales have been made at 17s. British refined is worth 22s. 6d. to 23s. 6d.

SODA COMPOUNDS.—Unaltered. Bicarbonate, £7 8s., London. Caustic, 70 per cent., £8, with 60 per cent., £1 less. Crystals, 38s. Hyposulphite, £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, MAY 9, 1895.

The most interesting feature in this week's Drug Market has been the continued advance in crude camphor, which has advanced by leaps and bounds since our last report. The bulk of the business has been in the Chinese variety, and prices are still continually on the rise. Full details are given below:—

CAFFEINE.—Famine prices are still paid for this in second hands, whenever offered. For small lots, 27s. has been paid during the week, for spot delivery.

CAMPHOR (CRUDE).—As above mentioned, the prices have been enormously advanced during the week, and continue to rise. The closing quotation given last week for China for arrival was 110s. to 112s. 6d., c.i.f., April to June shipment. Since then the principal items have been 4000 cases at 107s. 6d. to 112s. 6d., c.i.f., and 1500 cases, 117s. 6d. to 122s. 6d., c.i.f., April to June shipment. Yesterday 137s. 6d., c.i.f., was paid, and 140s., c.i.f., asked. Arrival sales of 300 parcels of Japan near at hand, were made on Monday at 122s. 6d., and April to June shipment, 127s. 6d., c.i.f., but since then the prices have advanced proportionately to Chinese, and it closes at 137s. 6d., c.i.f.

CAMPHOR (REFINED).—A move has at last been made by the English and German refiners, the prices being advanced 2d. per lb. on the 7th inst. The current quotations are now:—1s. 7½d. for bells and flowers in 10 cwt. lots, with squares at proportionate rates.

CLOVES.—Quiet. Quotations for Zanzibar are more or less nominal, and remain easy at 2½d. for June to August delivery.

COCA.—A good demand exists for good quality leaves, both Truxillo and Ceylon, which have been selling freely privately, at 1s. 2d. to 1s. 3d. for Ceylon leaves, with 10d. to 1s. paid for fine broken Truxillo leaves of good green colour.

COCAINE.—Quotations remain unchanged as given in our last report.

CODEINE.—The manufacturers have again lowered the price by 6d. per oz., and the current quotations are now 10s. 3d. to 10s. 9d., according to quantity and brand.

COLOCYNTH.—Very firmly held, and the scarcity of the better qualities continues. Good pale Turkey apple sells readily privately at 1s. 10d., and 2s. is now asked.

COPAIBA.—Little business has been done privately, but it is very steady, good Maranhão being worth 1s. 9d. to 1s. 10d., whilst for bright balsam, of Para character, 1s. 7d. is asked.

IPCACUANHA.—Sales privately of Cathagena root have been made at the steady rate of 3s. 8d. for first-class damaged root.

JALAP.—There is a firmer tendency in the market, and holders ask 11d. for good Vera Cruz root. A considerable amount will be brought forward at the next drug sales.

MENTHOL.—Rather quiet; 5s. 6d. would be accepted on the spot. For delivery the quotation is 14s. for good white dry crystals.

MORPHINE.—Again lower, in sympathy with the other opium alkaloids, the current quotation now being 4s. 3d. for 1000 oz. lots, 4s. 5d. for smaller wholesale quantities. Crystals: 2s. per oz. more.

OILS (ESSENTIAL).—Star anise: No change has occurred, and 6s. 5d. has been paid during the week on the spot. Nominally the quotation remains at 6s. 6d. Cassia: A shade easier, 4s. 9d. to 5s. being asked on the spot for 75 to 80 per cent. oil. For arrival it is quoted at 4s. 7d. to 4s. 8d., c.i.f. terms. Citronella: Remains very steady; 1s. 2d. has been paid on the spot during the week, and

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words including name and address, are inserted free in this column. They should be sent on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C.," and must not partake of the nature of ordinary advertisements.]

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

OFFERED.

'CHEMIST AND DRUGGIST,' 8½ years (unbound), and 2 years bound, only one number missing. 1½ year *British and Colonial Druggist*, four numbers missing. Offers wanted—Birschem, Chemist, Lincoln.

BOOKS AND APPARATUS.—Attfield, Fownes' 'Chemistry,' 'B.P. and Additions,' Muter's 'Chemistry,' Muter's apparatus, cost 12s. 6d.; half published price, or £1 lot. Splendid condition.—Stack, 40, Broadway, Kettering.

Marriage.

DAND—HALL.—At Queen's Road Presbyterian Church, on the 2nd inst. (by licence by the Rev. John Tudhope), Arthur, youngest son of the late H. R. Dand, Wigton, Cumberland, to Sallie, third daughter of William Hall, Amfield, Liverpool, and Mount Pleasant, Loch Maben, N.B.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

THE SHEEP DOCTOR. A Guide to the British and Colonial Flockmaster in the Treatment and Prevention of Disease. By GEORGE ARMATAGE, M.R.C.V.S. (F. Warne and Co., London.)

DIRECTIONS FOR LABORATORY WORK IN BACTERIOLOGY. By F. G. NOVY, Sc.D., M.D. (George Wahr, Michigan, U.S.A.)

ILLUSTRATED LECTURES ON AMBULANCE WORK. By R. L. ROBERTS. Fifth edition. (H. K. Lewis, London.)

OUTLINES OF ZOOLOGY. By E. J. ARTHUR THOMSON, M.A., F.R.S.E. Second edition. (Young J. Pentland, Edinburgh and London.)

OBJECT LESSONS IN BOTANY. By E. SNELGROVE. (Jarrold and Sons, London.)

LABORATORY GUIDE FOR THE BACTERIOLOGIST. By L. FROTHINGHAM, M.D.V., \$0.75. (W. B. Saunders, Philadelphia, U.S.A.)

A NEW METHOD OF INHALATION FOR THE TREATMENT OF DISEASES OF THE LUNGS. By W. H. SPENCER, M.A., M.D. (The Scientific Press, Limited, London.)

PHARMACOPEIA OF THE ROYAL INFIRMARY OF ABERDEEN. Revised Edition, 1s. nett. (James G. Bissett, Aberdeen.)

DIE PRAXIS DES CHEMIKERS. By Dr. F. ELSNER, Parts 4, 5, and 6. M. 1.25 each. (Leopold Voss, Hamburg and Leipzig.)

DIATOTHERAPIE FÜR AERZTE UND STUDIRENDE. By Dr. F. SCHILLING. (J. F. Bergmann, Wiesbaden.)

Late Advertisements.

Assistants Wanted.

JUNIOR. Age about 21. Must be a good Dispenser and accustomed to a good Retail. Apply, personally, between 6 and 9 p.m. THOMAS GREENISH, 20, New St., Dorset Sq., N.W.

AN energetic ASSISTANT. Must be well up in his business. Apply, stating age, salary required, photo, and full particulars, E. C. ASHFORD, Gold St., Northampton.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, MAY 11.

Pharmaceutical Cricket Club v. St. Margaret's, at Twickenham. Train from Waterloo, S.W.R., at 2.15.

School of Pharmacy Students' Association.

Botanical Excursion to Hendon. Leave King's Cross (Metropolitan) 2.7 p.m. (Midland Train).

MONDAY, MAY 13.

Society of Arts (Cantor Lectures), at 8 p.m.

"Recent American Methods and Appliances Employed in the Metallurgy of Copper, Lead, Gold, and Silver" (Fourth Lecture), by James Douglas.

Royal Geographical Society, at 8.30 p.m.

"A Journey on the Upper Euphrates," by D. G. Hogarth, Esq.

"Journeys in the Peninsula of Halicarnassus," by J. L. Myres, Esq.

TUESDAY, MAY 14.

Royal Institution of Great Britain, at 3 p.m.

"Thirty Years' Progress in Biological Science," by Professor E. Ray Lankester.

Royal Photographic Society, at 8 p.m.

"The Cyclograph" (Illustrated), by A. H. Smith.

"The Changes that Platinum Prints are Liable to," by Chapman Jones.

Royal Colonial Institute, at 8 p.m.

Ordinary Meeting.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

Edinburgh District Chemists' Trade Association, at 9 p.m.

Annual Meeting.

Election of Office Bearers, etc.

WEDNESDAY, MAY 15.

Royal Microscopical Society, at 8 p.m.

"On the Anatomy of *Nyctotherus ovalis*," by W. C. Bosanquet.

"A New Microtome for Cutting," by Dr. A. Bruce.

"Some Details of the First Nuclear Division in the Pollen-Mother-Cells of *Lilium martagon*, etc.," by Miss Ethel Sargent.

Western Chemists' Association (of London), at 9 p.m.

"Discussion on the Present Phase of the Poison Law."

THURSDAY, MAY 16.

Royal Institution of Great Britain, at 8 p.m.

"The Liquefaction of Gases" (Fourth Lecture), by Prof. Dewar.

School of Pharmacy Students' Association, at 7 p.m.

"Plant Distribution," by J. B. Walker.

"Report on Materia Medica," by C. J. Taylor.

Chemical Society, at 8 p.m.

Ballot for the Election of Fellows.

"Kjeldahl's Process for the Determination of Nitrogen," by Dr. Bernard Dyer.

"The Action of Nitrous Acid on 1:4:2 Dibromodinitro," by Professor Meldola and E. R. Andrews.

"Derivatives of Succinyl and Phthalyl-Dithiocarbamides," by Professor Dixon and Dr. Doran.

FRIDAY, MAY 17.

Royal Institution of Great Britain, at 9 p.m.

"Robert Louis Stevenson," by Professor Walter Rayleigh.

Edinburgh Pharmacy Athletic Club, at 7 a.m.

The Swimming Section of above Club will meet at Corporation Baths to decide a four lengths' handicap race for two prizes. Entries to be sent to T. Welsh, 52, North Bridge, not later than Wednesday 15th inst.

SATURDAY, MAY 18.

Royal Institution of Great Britain, at 3 p.m.

"Picture Making," by Seymour Lucas.

Geologists' Association (London). Excursion to Betchworth and Headley. Leave Cannon Street (S.E.R.) at 1.35 p.m.

Pharmaceutical Journal

SUPPLEMENT.

LONDON, MAY 18, 1895.

Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

A Weekly Record of Pharmacy and Allied Sciences.

The oldest Journal addressing Pharmacists.

Circulating in the United Kingdom, France, Germany, Austria, Italy, Russia, Switzerland, Canada, the United States, South America, India, Australasia, South Africa, etc.

Editorial Office: 17, BLOOMSBURY SQUARE, W.C.

Publishing and Advertising Office, 5, SERLE STREET, W.C.

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ANNUAL SUBSCRIPTION, INCLUDING POSTAGE, 10s. 6d.

In addition to being the sole periodical publishing full and complete reports of the transactions of the Pharmaceutical Society and of the British Pharmaceutical Conference, the JOURNAL records the proceedings of pharmaceutical and other scientific societies throughout the country, and chronicles all important advances in pharmacy and allied subjects in this country and abroad. Reviews of new scientific and technical works form an important feature in the JOURNAL, and its pages are also open for the discussion of matters of importance to British pharmacists generally, as well as for the purpose of supplying special information desired by subscribers.

The JOURNAL is supplied from the Publishing Office, 5, Serle St., Lincoln's Inn, W.C., post free for twelve months to any address throughout the world, on receipt of remittance for Ten Shillings and Sixpence.

Special Issue of the Journal.

The PHARMACEUTICAL JOURNAL for next week will contain a full report of the FIFTY-FOURTH ANNUAL MEETING of the Pharmaceutical Society, the result of the

Election of Council

for the ensuing twelve months, and a Special Report of the Annual Dinner. The Supplement of the same issue will be enlarged and contain a special article on

Photographic Matters,

as affecting chemists and druggists, together with photographic formulae, etc. A copy of the Journal will be sent to

Every Chemist in Business

in England and Wales, Scotland, and Ireland, whose address can be ascertained, as well as to others interested in pharmacy. The number of copies sent out on this occasion will exceed

11,000.

Advertisements for the Special Issue should be sent without delay to the Publishing Office, 5, Serle Street, Lincoln's Inn, London, W.C.

Trade Notes.

THE CHEMISTS' AERATED AND MINERAL WATERS ASSOCIATION, LIMITED, supplies its products through chemists only, and up to the present 3000 have joined the Association.

* * * * *

THE LIQUOR CARNIS Co., 50, Holborn Viaduct, E.C., offers a new preparation called "Shepperson's Meat Juice," described as "a preparation of beef juice which has its albumin in a perfectly raw condition, rich in nutrient and extractives, and one that admits of direct absorption." Miniature samples are supplied for physicians, and two ounce bottles are retailed at 1s. 9d. each.

* * * * *

BRONCHI-FUME is the registered title of a remedy for asthma and bronchial affections generally, prepared by Mr. W. A. Manning, Wyld Green, near Birmingham. The powder appears to contain cubebs, stramonium, and other ingredients, the fumes from which have a beneficial effect in diseases of the respiratory organs.

Personal Notes.

Mr. FRANCIS GALTON, F.R.S., is to receive the honorary degree of Doctor of Science at Cambridge.

* * * * *

Mr. F. W. SHORT, Assistant to Professor Attfield, and Secretary to the School of Pharmacy, will shortly take up the appointment of chemist to Messrs. W. J. Bush and Co.

* * * * *

Professor J. REYNOLDS GREEN, M.A., Sc.D., Dean of the School of Pharmacy, is one of the selected candidates for admission to the Royal Society.

* * * * *

Dr. P. DANGEARD has been appointed Professor of Botany to the Faculty of Sciences at Poitiers.

* * * * *

Mr. E. J. MILLARD has been elected a Fellow of the Royal Microscopical Society.

* * * * *

Mr. THOMAS GREENISH, who has just retired from the Pharmaceutical Council, has left England upon a visit to Malta for the benefit of his health.

* * * * *

Mr. S. W. FAIRCHILD, of the Firm of Fairchild Bros. and Foster, manufacturing chemists, New York, and President of the New York College of Pharmacy, is at present in England.

* * * * *

Mr. THOMAS TYRER (of Thomas Tyrer and Co., Stratford), has been nominated President of the Society of Chemical Industry. He was the first metropolitan secretary, fourteen years ago, and succeeded Mr. David Howard as Chairman of the London section.

* * * * *

M. VILLIERS has been appointed to the newly-created chair of analytical chemistry at the Paris Ecole de Pharmacie.

* * * * *

PROF. GUIGNARD, of the same school, has been nominated Chevalier of the Legion of Honour.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, MAY 16, 1895.

There have been several changes of interest in the chemical market since our last report. Tartaric acid is still very firm, and prices have been further advanced, whilst cream of tartar has also been a very steady market at higher rates. Sulphate of ammonia has been steadily rising, and is likely to continue to do so. Importers of quicksilver have raised their prices, and this movement has been followed by an advance in mercurials. Full details are given below:—

ACID CITRIC—Has been in fairly steady demand at unchanged rates. It is still quoted at 1s. 1½d. to 1s. 2d., according to quality.

ACID OXALIC—In steady demand at the unchanged rate of 3½d. net ex rails.

ACID TARTARIC—Throughout the week has been in good demand at advanced rates. English manufacturers now quote at 11½d. to 11¼d., whilst foreign brands of acid, both in crystals and powder, are worth 11d. to 11¼d.

AMMONIA SALTS—Generally a firm market. Carbonate remains unchanged at 3¼d. to 3½d. *Liquor*: Steady at 3d. to 3½d. *Sal ammoniac*: The quotation for first quality is unchanged at 39s., with seconds at 37s. Sulphate has been steadily advancing throughout the week, and still higher rates are probable. Grey 24 per cent. is now worth £10 5s., which shows an advance of 10s. over last week's closing rate.

ASHES—Selling steadily at unaltered rates, American being still worth 40s., with pots at 23s.

ARSENIC—No change is to be noted, and best powdered white remains at the quotation of 15s.

BENZOLE—Fifty per cent. is unchanged, the quotation being 1s.; 90 per cent. is, however, lower, being also quoted at 1s.

BLEACHING POWDER—The steady demand has continued at unaltered rates, £7 to £7 10s. being the price in London, whilst in Liverpool it is quoted at £7 to £7 5s. f.o.b. or on rails.

BORAX—Still a dull market, and Convention prices are unchanged from 20s. for crystals, with powder at 21s., whilst in second hands it offers at 1s. to 1s. 6d. less.

COPPER SULPHATE—Sales have somewhat improved, although the prices are unaltered. Quotations range from £14 5s. to £15 10s., the latter price being paid for special brands.

CREAM OF TARTAR—A very strong market at an advance of fully 2s. German makers' quotations for powder on the spot are now 72s., whilst 70s. is the price for fine white French crystals.

MERCURIALS—In consequence of the advance in quicksilver, the manufacturers raised the prices all round by 1d. per lb. on the 15th inst. The current quotations are now:—*Calomel*, 2s. 11d.; *red precipitate*, 3s. 2d.; *white precipitate*, 3s. 2d.; *corrosive sublimate*, 2s. 7d.

PHOSPHORUS—Unchanged, wedges being quoted at 2s., with sticks at 2s. 1d.

POTASH SALTS—Unaltered. *Bichromate*: Quotations are steady at 4½d. to 4¼d. *Chlorate* unchanged at 4½d. in London. In Liverpool also it is firm at 4½d., f.o.b. *Pernanganate*: Small crystals offer at 52s. 6d. to 53s. *Prussiate*: Steady at 9d. to 9¼d.

QUICKSILVER—Importers raised their quotations on the 15th inst. by 5s., and their price is now £7 5s., whilst in second hands, £7 4s. is asked.

SALTPETRE—Bengal, 3½ to 5 per cent. is quiet at 17s. 9d. on the spot. British refined is worth 23s. 6d. to 23s. 6d.

SODA COMPOUNDS—Unaltered. *Bicarbonate*, £7 5s. London, whilst in Liverpool it offers at £6 15s. *Caustic* 70 per cent., dull of sale at £8, with 60 per cent., £1 less. *Crystals*, 38s. *Hyposulphite*, £6 5s. in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, MAY 16, 1895.

The drug sales passed off very quietly to-day, there being few inquiries for many of the goods offered. Full details are given below:—

ACACIA—A fair amount was offered to-day, but met with little demand. *Soudan* sorts were in at prices ranging from 60s. to 65s. Four bales of *Turkey* sorts sold without reserve at 80s. to 90s. *Picked gum* from Trieste was bought in at prices ranging from £12 to £13 10s. per cwt.

ACONITE (JAPANESE)—Fifteen bags of fair root were bought in at 25s.

ALOES—Cape aloes remain firm. A parcel of 35 cases sold freely at 20s. to 24s. for drossy seconds to good bright hard. Of *Curaçao*, 200 gourds sold without reserve at 21s. for dull, lively qualities, whilst fair brown liver sold at 43s. *Socotrine* was bought in at 70s. to 75s. for good soft brown of fair aroma.

AMBERGRIS—Only two tins were offered to-day, and they were bought in at 60s., a bid of 42s. 6d. being refused for greyish lumpy.

AMMONIACUM—Five cases mixed seedy block, scented with *asafoetida*, sold at 24s. The remainder of that offered was bought in at 40s., for seedy mixed gum part blocky.

ANISEED—Thirty bags of fair quality *Spanish* seed from Alicante was bought in to-day at 33s.

ANNATTO SEEDS—In good demand, and higher prices were paid. Three bags *Cocoonata* seed sold to-day at 4s., whilst a parcel of good bright *Madras* sold at 4¼d. to 4½d.

ARECA NUTS—Bought in at 12s. 6d.

ASAFOETIDA—378 cases were offered again to-day, but met with no demand. The prices obtained were as follows:—Fine grey almonds mostly free £5, good pale, partly blocky almonds, 77s. 6d. to 80s., good pinkish mixed blocky and drossy, 77s. 6d. to 80s., soft greyish and pinkish block, 35s.; and from 20s. to 15s. for ordinary gum.

BENZOIN—*Sumatra*: Seven cases of small almondy seconds, slightly false packed, sold at £7 7s. 6d. *Palembang*: Second was bought in at 45s., and blocky thirds at 22s. 6d. *Siamese* and *Penang* gum was all bought in at steady rates.

BERRIES (YELLOW)—A parcel of fine new berries were all bought in at 20s. to 25s.

BUCHU—Good bright round green leaves were bought in at 3½d. to 4d., and the long variety at 6d. to 8d. A parcel of ordinary yellow short leaves sold freely at 2¼d. to 3d.

CAFFEINE—The scarcity continues, and it is said that 80s. has been paid for small parcels in second hands. To-day two 7 lb. tins of *Whiffen's* make were bought in, the price being 27s. 6d.

CALUMBA ROOT—A parcel of ordinary mixed root, slightly wormy, sold to-day at 7s.; fair to good bright yellow washed root was bought in at 23s. to 30s.

CAMPOR (CRUDE)—Since our last report, prices have steadily advanced, and for arrival May to July shipment, 147s. 6d. to 148s., c.i.f., has been paid, with *Japan* at 150s., c.i.f. From Formosa, an excited market is reported, and quotations are 172s. 6d., c.i.f., to-day. *Japan* was bought in at 170s., and a portion of another parcel was sold at 150s.

CAMPOR (REFINED)—On the 13th inst. English and German refiners again advanced their quotations for refined camphor, and current rates are now 1s. 9½d. for bells and flowers in lots of not less than 10 cwt., with squares at proportionate rates. To-day 2 casks of German were bought in at 2s.

CANELLA ALBA—Four bales of good small bark were bought in to-day at 32s.

CANTHARIDES.—Five casks of *Russian* flies were bought in to-day at 3s., whilst a parcel of somewhat dusty *Chinese* flies were also held, the limit being 1s. to 1s. 1d., according to size.

CARDAMOMS.—A large proportion of the cardamoms offered to-day formed part of a cargo of the *S.S. Powderdam* from Ceylon, and had been damaged by water and smoke to varying extents. The prices obtained were 7d. to 1s. 5d., according to size and condition for *Ceylon-Malabar*. Prices obtained for *Ceylon-Mysore* were small to medium, pale plump, 2s. 8d. to 2s. 7d.; small to medium discoloured, 1s. 8d. to 1s. 7d., down to 1s. for small dark split. Seed sold at 1s. 10d. to 1s. 11d. *Ceylon-Malabar*, 1s. to 1s. 6d. for small to medium brown.

CLOVES.—The market for *Zanzibar* has been in a very excited condition, and a large amount of speculative business has been done. At the sale on Wednesday higher prices showing generally an advance of ¼d. to 1d. were obtained, the price being—ordinary, dark, 8d. to 3½d.; fair, 3½d. to 3¾d.; good bright, 3½d. to 3¾d.

COCAINE.—The manufacturers have again reduced their quotations by 1s. per oz., and the current prices are now as follows:—For 100 ozs. or more, 17s. 8d.; from 25 to 100 ozs., 17s. 6d.; for lots under 25 ozs., 17s. 9d. These quotations are for *Cocaine* in tins, 1-oz. bottles being charged 3d. per oz. more.

COCA.—Three bales of broken *Truxillo* leaves of good colour were offered to-day. The best of the parcel was bought in at 1s., the limit being 11d., whilst second and third class sea-damaged sold at 9¼d. and 7¼d. respectively.

CASCARA SAGRADA.—To-day 68 bags were bought in at 17s. to 18s. 6d. for medium quality bark.

CASCARILLA.—Fourteen bales of small silvery bark were bought in at 55s.

CASTOREUM.—9 boxes were bought in at 100s.

CINCHONA.—A parcel of 43 serons *Crown* bark sold freely at rates ranging from 7d. to 11d., with 4½d. to 6½d. paid for first-class damaged.

CODEINE.—Prices remain at the reduction rate noted last week, the quotations being 10s. 8d. to 10s. 9d., according to quantity and brand.

COLOCYNTH.—Three cases of small broken *Spanish* were bought in to-day at 1s. 1d. Good qualities remain scarce.

COPAIBA.—*Bahia* balsam of good bright colour sold to-day at 1s. 6d.

CORIANDE SEED.—*East Indian* seed was bought in to-day at 6s. 6d. per cwt.

CUBES.—Entirely neglected. *Good berries* from Singapore were bought in at 55s. to 60s.; medium ditto, 45s.

CUMIN SEED.—Dusty *Maltene* seed sold without reserve at 24s. 6d. The remainder was bought in.

CUTTLEFISH.—Bought in at 2d. for small to bold, somewhat dull.

DRAGONS BLOOD.—Neglected. Two cases of fair *Singapore* block, somewhat dull, were knocked down subject at 26 5s. The remainder was all bought in at the rates of £12 5s. to £13 for fine gum in reeds; ordinary bright to dull block £2 0 down to 26 10s.

ELEMI GUM.—Lower. Twenty cases sold at 24s. to 27s. for somewhat dark, dirty gum to fair ditto.

ERGOT OF RYE.—Ordinary quality *Russian* sold to-day at 5½d. to 6d., whilst for *Spanish* Ergot sold without reserve, 7d. to 7½d. was paid for wormy quality.

GALBANUM sold at 1s. 2d.

GAMBGE.—Good blocky gum sold at £7 10s., whilst £8 17s. 6d. were paid for small, rather dull pieces, with mixed fracture.

HONEY.—A large amount offered, but there was no demand. *Californian* was bought in at 45s.; *Australian* at 25s. to 26s.; *Jamaica* sold at 22s. subject, for dirty, somewhat thick.

IPHOACUANHA.—There was a good demand for lower grades of *Rio (Brazilian)* root, which sold freely at 3s. 9d. to 3s. 11d. for ordinary damaged root. The best qualities, however, were very firm, as much as 4s. 11d. being paid for plump, sound root. The bulk of the best root was

bought in at from 4s. 6d. to 5s. 6d. *Carthagenia* is very firm, and 8s. 2d. to 8s. 3d. was paid for first-class damaged root.

JALAP.—Sold freely. A parcel of 57 bales were all sold at prices ranging from 9¼d. for fair sound *Vera Cruz*, down to 6¼d. to 8½d. for mouldy, more or less damaged, and wormy.

KAMALA.—Three cases were bought in at 11d., the limit being 10d.

KINO.—A box of *East Indian* gum was bought in at £20.

KOLA.—All bought in at prices ranging from 1s. 8d. to 1s. 6d.

LITHIA CARBONATE.—Ten packages were bought in at 8s.

MORPHINE.—Unchanged, the current quotations being 4s. 8d. for 1000 oz. lots, and 4s. 5d. for smaller wholesale quantities, with *crystals*, 3d. per oz. more.

MYRRH.—Good clean siftings were sold at 51s., ordinary ditto, 38s., pickings 20s.

NUX VOMICA.—Medium grey *Bombay* seed sold at 8s., with 2s. 6d. to 3s. 6d. paid for damaged.

OILS (ESSENTIAL).—*Aniseed*: Steady at unchanged rates, 6s. 4d. to 6s. 5d. continues to be paid on the spot. *Bergamot*: Four cases sold without reserve at 3s. *Cajuput*: Bought in to-day at 2s. 9d. *Camphor*: Bought in at 30s. *Cassia*: 4s. 8d. to 5s. is still asked for 75 to 80 per cent. oil. A parcel was bought in to-day at 4s. 8d. *Cinnamon*: Sold without reserve at 7¼d. *Citronella*: very steady, and 1s. 3d. has been paid on the spot during the week. *Lemon Grass*: Nominally 1½d. It was bought in to-day at that rate. *Otto Roses*: Bought in at 20s. *Peppermint Dementholised*: Unchanged at 6s. 6d. *H. G. Hotchkiss'* oil is steady at 9s. 9d. to 10s. *Japanese* 40 p.o.: Unaltered at 8s. 6d. *Rose*: Bought in at 4½d.

OILS (FIXED) AND SPIRITS.—Finest new non-congealing oil is now worth 155s. on the spot per barrel of twenty-five gallons. *Linseed* steady, but quiet at unaltered rates, £20 12s. 6d. being the price in barrels on the spot. *Kape*: A dull market. Refined oil is still worth £22 10s. to £22 15s. on the spot. *Turpentine*: Very firm at advancing quotations. *American*: Spirits are to-day worth 22s. 3d. on the spot. *Petroleum*: Dearest. *American* is quoted at 8½d., *water white*, 8d. to 8½d., and *Russian*, 5½d. *Spirit*: *American*, 8½d. to 8¼d.; *deodorised*, 8½ to 9d.

OPIUM.—Steady prices continue to be paid. *Persian*, for which 12s. 6d. has been paid during the week for good quality. *Turkey* opium is dull of sale, and soft shipping descriptions are quoted nominally at 11s. 9d. to 12s.; best druggists', 10s. to 10s. 6d.; seconds ditto, 9s. to 9s. 6d.

ORANGE PEEL.—Coarse cut dark *Malta* peel was bought in at 5d., and fine cut bright, of good aroma, at 9d.

ORRIS ROOT.—*Florentine*: Best selected was bought in at 85s., with sorts at 72s. 6d.

QUININE SULPHATE.—There have been no sales of importance, and business is slow owing to the advanced prices asked. There are offers of 1s. 0¼d. for B. & S. or *Brunswick*, but holders ask 1s. 0¼d. To-day 5000 ozs. was bought in, a bid of 1s. 0¼d. not being forthcoming.

SARSAPARILLA.—Good *Lima Jamaica* sold at 1s. 4d. to 1s. 5d., with *Para* at 1s. 5d.

SHELLAC.—A very firm market at advanced prices. At the auctions on Tuesday no *TN. Orange* was offered, and *Garnet* and *Button* were mostly bought in. All the *Second Orange* sold, the prices being 26 14s. to 26 15s. for good pale free *AA.*, and 26 11s. to 26 14s. for bright cakey *DJ.* Privately 125s. has been paid for fair *TN Orange* and 180s. is now asked, whilst for *A. C. Garnet* 112s. has been paid, and 109s. for *OCO.*

SENEGA ROOT.—Bought in at 1s. 6d., the bid being 1s. 5d.

SNAKE ROOT.—Bought in at 2s. 6d.

TAMARINDS.—*West Indian* sold at 21s. to 24s., with *East Indian* at 7s. 6d.

WAX.—In fair demand only. *Zanzibar*, sold at £7 2s. 6d. Dull bleached *Madras*, 26 13s. *San Domingo*, 26 15s. to 27. *Madagascar* 27 5s. to 27 7s. 6d.

Exchange.

[Notices of books, apparatus, etc., for exchange, not exceeding thirty words including name and address, are inserted free in this column. They should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C.," and must not partake of the nature of ordinary advertisements.]

OFFERED.

CHANGING BOX.—Adam's $\frac{1}{4}$ -plate, cost 50s., also 50 coloured photographic lantern slides; exchange either or both for $\frac{1}{4}$ -plate or $\frac{1}{2}$ -plate apparatus, with or without lens.—GREEN, 355, Wandsworth Road, S.W.

BARNETT AND FORSTER'S SODA-WATER MACHINE, 1·2 size, equal to new, price £15.—Apply to R. H., 1, Southwick Street, W.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

DIE SERUMTHERAPIE DER DIPHTHERIE. By Dr. ADOLF BAGINSKY. (August Hirschwald, Berlin.)

B. BRADSHAW'S DICTIONARY OF BATHING PLACES AND CLIMATIC HEALTH RESORTS. With a map, price 8s. 6d. (Kegan Paul, Trench, Trübner and Co., London.)

THE STUDENT'S HANDBOOK OF FORENSIC MEDICINE AND PUBLIC HEALTH. By H. AUBREY HUSBAND, M.B., O.M. Illustrated. Sixth Edition. Price 10s. 6d. nett. (E. and S. Livingstone, Edinburgh.)

FIELD-PATH RAMBLES AMONG THE SURREY HILLS. By W. MILES. (R. E. Taylor and Son, London.)

THE PRACTICAL TELEPHONE HANDBOOK. By JOSEPH POOLE. (Whittaker and Co., London.)

ELECTRICITY IN OUR HOMES AND WORKSHOPS. By S. F. WALKER. (Whittaker and Co., London.)

STATE EDUCATION: ITS SCOPE AND RESPONSIBILITIES. A Speech Delivered at the Opening of Brunsfield School, Edinburgh, April 19, 1895. By HENRY CRAIK, C.B., LL.D. (Macmillan and Co., London.)

CRYSTALLOGRAPHY: A TREATISE ON THE MORPHOLOGY OF CRYSTALS. By N. STORY-MASKELYNE, M.A., F.R.S. Price 12s. 6d. (Clarendon Press, Oxford, and Henry Frowde, London.)

CHEMISTS AND THEIR WONDERS. By F. M. HOLMES. 1s. 6d. (S. W. Partridge and Co., London.)

PHYSICAL EDUCATION. By ARCHIBALD MACLAREN. New edition, re-edited and enlarged by WALLACE MACLAREN, M.A., Ph.D., with four hundred illustrations drawn from life. Price 8s. 6d. nett. (Clarendon Press, Oxford, and Henry Frowde, London.)

Company Business.

ALDGATE DRUG STORES, LIMITED.—Registered by Waterlow and Sons, Limited, London Wall, E.C., with a capital of £2000 in £1 shares. Objects: To manufacture and deal in pharmaceutical preparations, drugs, medicines, etc., and to dispense physicians' prescriptions. Registered office, 116, High Street, Whitechapel.

* * * * *

DISINFECTANT COMPANY, LIMITED.—Registered by John Munroe, 11, Nelson Street, Commercial Road, E., with a capital of £2000 in £5 shares. Objects: To carry on business as manufacturers of, and dealers in, disinfectants, liquid, powder, tablets, etc., acids, soaps, chemicals, etc.

Late Advertisement.

OPEN SURGERY.—To Chemists and others. To be disposed of, owing to the death of proprietor. Near Blackfriars, S.E. Been carried on by late proprietor for about 20 years. Easy terms. No agents. MEDIC'S, 1, George St., Mansion House, E.C.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, MAY 18.

Pharmaceutical Cricket Club v. Burgess, Burbidge and Co., at Willesden. Train leaves Euston at 2.15 p.m.
School of Pharmacy Students' Association.
Botanical Excursion to Willesden. Train from Euston 2.15 p.m.

MONDAY, MAY 20.

Medical Society of London.

Conversations and Reception, by the President.
"The Recent Evolution of Surgery," by A. P. Gould.
TUESDAY, MAY 21.

Pharmaceutical Society of Great Britain, at 6.45 p.m.
Annual Dinner at the Whitehall Rooms, Hotel Métropole.

Royal Institution of Great Britain, at 8 p.m.

"Thirty years' Progress in Biological Science" (Second Lecture), by Professor E. Ray Lankester.
Royal Photographic Society, at 8 p.m.

"Apparatus for Process Photography," by William Gamble.

Institution of Civil Engineers, at 8 p.m.

Ordinary Meeting.

WEDNESDAY, MAY 22.

Pharmaceutical Society of Great Britain, at 12 noon.

Annual Meeting.

Geological Society of London, at 8 p.m.

Evening Meeting.

Nottingham and Notts. Chemists' Association, at 8 p.m.
Annual Meeting at the Masonic Hall, Goldsmith Street.

Discussion on the "Shops (Early Closing) Bill."

THURSDAY, MAY 23.

Royal Institution of Great Britain, at 3 p.m.

"The Instruments and Methods of Spectroscopic Astronomy," by Dr. W. Huggins.

FRIDAY MAY 24.

Royal Institution of Great Britain, at 9 p.m.

"The Absolute Measurement of Electrical Resistance," by J. Viriamu Jones.

Linnean Society of London, at 3 p.m.

Anniversary Meeting.

SATURDAY, MAY 25.

Royal Institution of Great Britain, at 3 p.m.

"Picture Making" (Second Lecture), by Seymour Lucas.

Geologists' Association (London).

Excursion to Goring. Leave Paddington at 10.2 a.m.

Partnerships Dissolved.

[From the London Gazette.]

William Borrow Trick and William Bowdon, chemist and druggists, 208, Edgware Road, W., carrying on business under style of William and Bowdon. Debts will be received and paid by W. B. Trick.

* * * * *

Edward Woredell and Arthur Edward Fox, chemist and druggists, 23, Parson's Street, Banbury.

* * * * *

Frank Iliffe and William Iliffe, surgeons, Derby.

* * * * *

Samuel Kennedy and Samuel Arthur Stoddart Kennedy, physicians and surgeons, 23, George Street, Hanover Sq. W. Debts will be received and paid by Samuel Kennedy.

* * * * *

Buckley Brooks and Harry Edgar Causser, carrying on business as chemical agents and isinglass merchants under style of B. Brooks and Co., 13A, Exobange Street, Chesham, Manchester. The business will be carried on by Buckley Brooks under same style as heretofore.

* * * * *

Thomas Henry Duckworth and Saul Wright, carrying on business at A. hercott Street, Oldham, as adulated mineral water manufacturers and ale and porter bottlers, under the style of Duckworth and Wright.

Pharmaceutical Journal

SUPPLEMENT

LONDON, MAY 25, 1895.

Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

A Weekly Record of Pharmacy and Allied Sciences.

The oldest Journal addressing Pharmacists.

*Circulating in the United Kingdom, France, Germany,
Austria, Italy, Russia, Switzerland, Canada, the
United States, South America, India,
Australasia, South Africa, etc.*

Editorial Office: 17, BLOOMSBURY SQUARE, W.C.

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AN AVERAGE OF 7,000 COPIES PRINTED WEEKLY.

ANNUAL SUBSCRIPTION, INCLUDING POSTAGE, 10s. 6d.

In addition to being the sole periodical publishing full and complete reports of the transactions of the Pharmaceutical Society and of the British Pharmaceutical Conference, the JOURNAL records the proceedings of pharmaceutical and other scientific societies throughout the country, and chronicles all important advances in pharmacy and allied subjects in this country and abroad. Reviews of new scientific and technical works form an important feature in the JOURNAL, and its pages are also open for the discussion of matters of importance to British pharmacists generally, as well as for the purpose of supplying special information desired by subscribers.

The JOURNAL is supplied from the Publishing Office, 5, Serle St., Lincoln's Inn, W.C., post free for twelve months to any address throughout the world, on receipt of remittance for Ten Shillings and Sixpence.

PHOTOGRAPHY FOR CHEMISTS.

An exhibition of photography is now open at the Imperial Institute, and whilst by no means so representative as it should be, a very good idea can be gained from it of the numerous ramifications of this art-science and the many sciences to which it has become a most valuable handmaid. Taking, for example, astronomy, the assistance rendered by photography is not to be despised. If an expert and keen-sighted observer takes his seat at the eye-piece of the telescope he will see more at the first moment than is possible by any continued observation, from the simple physiological fact that the retinal nerves become fatigued, whereas if instead of the retinal surface the sensitive plate be presented to the telescopic image the chemical or electro-chemical action which takes place is cumulative, so that at the end of one minute the photographic retina, if we may call it so, will see sixty times the amount of detail or stars that it did at the first second of the impact of light, and 3600 times the number of stars at the end of the first hour. Beyond this also is the important point that the factor of the personal equation, which obviously is with differ-

ent observers by no means constant, is totally eliminated. It may of course be said that there is what may be termed a "personal equation" with a photographic plate, but this is a far more measurable quantity than the human factor, and that we have not yet reached the complete valuation of the photographic factor is due to a lack of serious study on the part of those whom it most concerns, but this is now engaging the attention of the most advanced of experts. As an example of photography applied to utilitarian arts as opposed to an abstruse science, reference may be made to the preparation of line and half-tone blocks for the reproduction of originals, both drawn and from nature. The oft-repeated cry that photo-mechanical processes have killed wood engraving, whilst not strictly true, has at least sufficient truth in it to cause several well-known and long-established wood engraving firms to file a petition in bankruptcy or else embark more capital in photo-mechanical reproduction processes. Nor is it an exaggeration to state that many of our serial publications literally owe their birth and present existence to photography.

The pharmacist may possibly wonder what value photography may be to him, and this is not a difficult question to answer. To the apprentice or student it may be a valuable means of education, as from correctly prepared photographs he may learn the actual appearances of *materia medica* and microscopic specimens, so that he can recognise the same when he meets with them in the shop or in the examination-room far more readily than the woodcuts or drawings which adorn the pages of our textbooks are alone available. After having successfully run the gauntlet of the examiners, and blossomed out into a full-blown pharmacist, photography may well be turned to commercial purposes, and from its enthusiastic devotees some of the burdensome rent, rates, and taxes may be gleaned. An amateur photographer is of all hobbyists as a rule the most enthusiastic, ever ready to spend money in new apparatus, in new plates and printing papers, in photographic literature; but to successfully deal with the trade it is necessary to understand photography, and a chemist is surely from his very training the man above all others to successfully cope with the exact science of photography, and the man to take as an adjunct to his business the supply of photographic chemicals and apparatus. To the more advanced pharmacist who has taken up microscopy as a relief from or adjunct to business, photography becomes a valuable handmaid, as well-prepared photo-micrographs are infinitely superior to any hand drawings by camera lucida, etc. Photography may also be utilised by the advanced chemist and analyst for obtaining undeniable records of characteristic absorption or line spectra. The professor will not only find his work rendered easier and more entertaining to his students by the projection of lantern slides of diagrams, equations, and microscopic specimens, but as this can be done in almost full daylight, there is no need to trouble about having the room darkened. Even chemical experiments can be projected on to the screen in actual operation, and the formation of a precipitate, the characteristic coloration or shape of a crystal, can be far more readily grasped by the student when seen *sic*, on an eight-foot screen, than

in the small test tube in the demonstrator's hands; whilst knowledge thus gained through the channels of eye and ear is far more likely to be of lasting benefit than in any other way. That this has been recognised by several of our large universities is possibly a well-known fact, and that even the Board School has adopted the lantern for its advanced evening classes is surely a sign that it is a subject not to be lightly dismissed.

Putting on one side, however, the utilitarian applications of photography, it may well serve as a relaxation for the tired and overworked pharmacist. For by thorough change of thought, by inducing him to make excursions, by giving him an object for his walks or an amusement and purpose in his holidays, it will become a keen fascination and total relief from the worries and cares of every-day business. The necessary outlay at first is but small, and care and patience are all that are necessary, whilst the various manipulations, involving the handling of exact quantities of chemicals, which to the untrained and popular mind seem so difficult, are a matter of course to the practical pharmacist. To the scientific chemist there is in photography a vast field for experimental work and for original investigations, and many opportunities for gaining fame and more solid rewards; for photography may yet be considered in its infancy, and the best known men, or at least some of them, are practical and practical only from long experience. They are able to do what they do, and speak with authority, from the practical standpoint, but from the purely scientific side there are very few who can speak with authority, or who can bring to bear upon the consideration of any subject the necessary scientific training or chemical knowledge, and photography is to a great extent a science based on purely chemical grounds. Commencing with this week it is proposed to present the readers of the Journal with a series of practical articles on photography as an adjunct to the ordinary business of a chemist, including formulæ and practical directions for working, from which may be gleaned not only the necessary information how to compound the special solutions, but also how to actually take photographs. As a further help queries upon all matters connected with photography will be answered with pleasure, and formulæ be given for any special preparations for which there may be a demand or seem a likely chance of pushing.

THE SALE OF PHOTOGRAPHIC REQUISITES.

There can be no doubt that the sale of photographic requisites is a lucrative business when properly managed, and chemists are, or readily can adapt themselves to be, the tradesmen best fitted to handle them. The amount of business to be done in this line will naturally depend upon the kind of neighbourhood of which any individual chemist may be the centre. It is quite possible even at the present time to find districts containing not more than two or three amateur photographers, with no chance of this number being materially increased. In such a locality it would pay a chemist quite as well, probably much better, to fill his pharmacy with safety bicycles or perambulators. But in the larger provincial towns, especially at seaside or other health or pleasure resorts, there is fine scope for a paying addition to a chemist's business, providing he has the time, room, and one or two other desirable qualifications.

Amongst these latter may be mentioned a certain amount of practical knowledge on the subject of photography by the chemist himself. This is by no means difficult to obtain. But it must be practical—the chemist must be able to do his own exposing, developing, printing, etc.,

and then with the experience of his previous scientific and technical training he will soon be in a position to give advice and assistance to the amateur who, in the earlier days of his photographic career, is continually in some desperate trouble or other. Many of these troubles arise from careless and incorrect preparation of the solutions required in the processes, and as a matter of fact there are chemists who have never sold or used a camera in their lives who do quite a nice little trade in simply making up the needed solutions—a department of dispensing worth looking after, which, saving the amateur much time and trouble, will be well patronised by those who are too busy or too lazy to do their own compounding.

It should, however, be mentioned that no attempt should be made to preserve the composition of the solutions as a priceless secret. Photographic literature, both serial and textbook, is so copious now that this cannot be very successfully attempted. The amateur photographer of to-day is of the new school, and must know of what his solutions are composed. Not that it will be necessary to print the actual working formula on the label, but as an example of what is meant, the following may serve:—

Pyrogallol Developer.

Every fluid drachm contains 6 grains of pure pyrogallol combined with a sulphite to prevent it from staining. For normal exposures use 20 minims for every ounce of developer.

John Smith, Pharmaceutical and Photographic Chemist,
146, Belvedere Park, Newtown.

Free dark-room for the use of customers.

This may serve as a model on which to found others, and in succeeding articles formulæ will be given for preparing such solutions.

It is also well that the chemist should be able to show some of his own work (providing he can produce something worth showing), ticketing it as "taken with So-and-so's 10s. 6d. landscape lens," or "with the £4 4s. 1/2 instantaneous set," and so forth. The chemist who can turn out a fairly good landscape photo, especially if he live in or near some show place, can work up a profitable trade in the sale of "photos of the district," apart from the sale of apparatus and chemicals.

The chemist who is also an amateur photographer will of course have a dark-room, which can be used on occasion by those of his passing customers who may require it, but even if he is not, a dark-room is almost a necessity. The chemist himself will know what room, closet, or even cellar, will best suit his purpose, but failing all these he might build one of black twill made light-tight with yellow fabric, stretched on a light wooden frame and placed in a corner of the shop. It need not take up much room, and outside may be so fitted with shelves, books, etc., for showing photo or other light goods, that its real nature is not at first apparent to the uninitiated.

To a great extent the size of the dark-room will depend upon the work that is to be done; it is frequently the case that many chemists keep a dark-room merely for changing plates in, and this is usually when they themselves do not photograph. Others, again, have sufficiently commodious rooms for developing. When a dark-room has been fitted up a note should at once be sent to the editors of the *Amateur Photographer*, 1, Creed Lane, London, E.C., and *Photography*, Herford Street, Coventry, stating whether the room is for changing only or for developing as well. At both these offices a register of dark-rooms is kept, and many are the applications these gentlemen have to reply to for the addresses of local dealers and dark-rooms.

The question as to "free" or "charge" for dark-room use is a vexed one, but this can well be got over by stating prominently "free use of dark room to customers for changing plates." This may lead of course to a question of how much the customer must spend, but that can without doubt be left to the good taste of both parties. To strange visitors a charge of 3d. should be levied for changing, whilst in all cases a charge of 6d. or 1s. per hour should be made for developing, exclusive of chemicals. A very good plan, particularly at the seaside, is to offer the customer the free run of the dark-room, both for changing and developing, for say 5s. per week, or half this sum for changing only. This will of course, apply to migratory customers only, but for local amateurs it is preferable to give them free run of the place in the hope that the oftener they visit the shop the more likely they are to buy.

The nature and amount of the initial stock will depend upon the possible resources of the neighbourhood, but as a general working rule take this advice: "Buy for $\frac{1}{4}$ -pl. and $\frac{1}{2}$ -pl. customers." Cameras, plates, dishes, etc., are made to definite measurements from the small "Lantern" size ($3\frac{1}{2}$ by $3\frac{1}{2}$) up to huge things 20 in. by 16 or larger, but the $\frac{1}{4}$ -pl. and $\frac{1}{2}$ -plate ($4\frac{1}{2}$ by $3\frac{1}{2}$ and $6\frac{1}{2}$ by $4\frac{1}{2}$) are by far the most popular sizes. These measurements are the actual dimensions of the sensitive plates, and a camera which will not take a larger plate than one measuring $6\frac{1}{2}$ by $4\frac{1}{2}$ is called a $\frac{1}{2}$ -pl. camera. By means of "carriers" the $\frac{1}{4}$ -pl. camera may be made to take smaller sizes, but if it be required to expose a larger plate a larger camera must be used. The greater number of those who take up photography as an amusement will probably buy a $\frac{1}{4}$ -pl. camera to commence with, requiring $\frac{1}{4}$ -pl. dishes, printing frames, etc., while a large percentage will start with a $\frac{1}{2}$ -pl. camera, and consequently require $\frac{1}{2}$ -pl. and $\frac{1}{4}$ -pl. et ceteras. But those who buy a larger camera than the $\frac{1}{2}$ -pl. (or an intermediate size between that and the $\frac{1}{4}$ -pl.) form a very small minority: hence in putting in stock the $\frac{1}{2}$ -pl. and $\frac{1}{4}$ -pl. customer is the one to be primarily considered. Messrs. Lancaster and Underwood, of Birmingham, have a world-wide reputation for good, useful cameras at a moderate price, while similar or more expensive goods will be found listed in many of the wholesale patent medicine catalogues, or in the lists of special makers, such as Marion, and Perken, Son and Rayment. It will be seen that the "camera" generally, though not necessarily, includes the camera, lens and cap, dark slide, and sometimes the tripod stand. In addition to this, the "dark cloth" to throw over the head and part of the camera while focussing is necessary. Then come the sensitive plates sold in light-tight packages of one dozen each. Their name is legion, but the "Ilford," "Britannia," "Cadett," "Wratten and Wainwright," and "Paget" are amongst those most frequently asked for.

Now we have all that is necessary for exposing the plate. Then comes the dark-room, with its ruby lamp, its porcelain or ebonite dishes, and its solutions for developing and fixing. When the picture is finished as far as the sensitive plate is concerned, the process of printing or bringing out the picture on prepared paper commences. For this we require sensitive or printing-out paper, printing frames, and further dishes for holding the toning and fixing solutions. Of printing-out papers there is a great variety (needing a variety of solutions for their manipulation), but the stock paper is the gelatino-chloride printing out paper, which can be had tinted blue or pink, or of a pure white colour. It will be desirable to keep this in the large sheets for the customer to cut to his own liking, and in packages

machine-cut (with round and square-cut corners) to definite sizes, particularly the quarter and half plate sizes. The favourite papers are the Bromide, the Ilford and Solio P.O.P., and the Platinotype, prices of which will be found in any list, and directions for working accompanying each packet. The printing frame is a simple matter, the cheap oak or teak article with square corners being as suitable for ordinary work as the more elaborate and expensive ones. The paper after toning and fixing requires washing. Various machines for this purpose are advertised, but a copious supply of running water is the desideratum, and with it a large shallow dish is all that is really required. Then comes trimming previous to mounting, and a few trimmers and cutting glasses should be included in the stock.

Lastly, the requisites for mounting the finished picture, the most important of which are the mounting paste (which the chemist can make himself), the squeegee, a roller for ensuring evenness of surface, and the cards and mounts of various sizes, including the carte-de-visite and cabinet (tinted and gold bevelled for the particular ones) for portraits, and the Oxford line and Indian tint mounts for landscapes and groups.

A perusal of a photographic price-list will show a great variety of more or less useful appliances, and special articles for special processes will be found in great abundance, but the items named in this short survey, while essential, are not discouragingly multitudinous, and with a comparatively small outlay a respectable start may be made in a departure which to many chemists has proved to be not only of a remunerative, but also of a decidedly instructive and interesting, nature.

Amateur photographers are voracious readers as a rule, and therefore their wants in this direction should also be catered for. There are several photographic journals and innumerable books on photography, and of the former the *Amateur Photographer* and *Photography* are the most likely to sell, whilst of textbooks an assortment should be obtained; a list will be given later of the best works to stock.

The chemist who takes up photography as a branch of his business will be wise if he keeps himself also pretty well posted in current photographic topics, though he may fairly well rely upon the notes which will subsequently appear in these pages to keep him au courant with what is likely to sell.

TRADE OPINIONS.

Several communications have been received from firms interested in the photographic business, in response to a request that they would furnish hints as to the stock likely to prove most useful to a chemist going into the business.

* * * * *

Messrs. R. and J. Beek, Ltd., 68, Cornhill, London, E.C., the noted opticians, write as follows:—

Upon first taking up the sale of photographic apparatus and material, the chemist would probably find his customers would largely consist of novices, as many of the expert amateurs would already have other sources of supply. He should therefore stock with a view to supplying the novice. The most well-known and well-advertised plates, films, papers, and apparatus which require least explanation, would be likely to sell best, as the novice hardly knows what he wants. Such well-known brands of plates as Ilford, Cadett, Barnet, Paget, and Imperial are always saleable, as also are ordinary and Frena films by Austin Edwards, B. J. Edwards, Fitch, etc. Papers by Ilford, Eastman, Elliott, and Paget, are the best known.

The greatest care would be required in stocking cameras, and at first well-advertised hand cameras by the best

makers would build up the most substantial business, as they would give satisfaction and customers would come again.

Those hand cameras supplied with very clear instruction books would relieve the salesman of considerable explanation. For instance, the Frena hand camera, so largely advertised, is supplied to dealers sealed and with a very carefully written handbook, so that even the novice requires no further instruction. The makers of this camera supply any dealer with descriptive pamphlets without their name, so that the chemist could stamp his own name thereon and distribute in his immediate neighbourhood. The Kodak is another camera likely to be purchased by the beginner.

A few ordinary cameras might be added to stock, say, $\frac{1}{4}$ and $\frac{1}{2}$ plate size, with tripods to suit them. Chemicals would, of course, form an important portion of stock, and tabloids and cartridges should not be lost sight of, as they are very convenient for the beginner. If the chemist will take the trouble to master the process, a considerable business may often be done by developing and printing from customers' negatives.

* * * * *

Messrs. Barclay, and Sons, Limited, 95, Farringdon Street, London, E.C., say:—For several years we have entertained the opinion that the sale of photographic goods is one which is remarkably well adapted to chemists' trade, and we have been urging those views for the last ten years or so, and although chemists are taking up the business to a considerable extent, we think it is likely they would go more into it if they were not afraid of the preliminary expense of purchasing a stock. However, a large stock of photographic goods to commence with is not at all desirable. There are many things in daily demand for photographic purposes, and a sufficient show of these, in the window for instance, can be made to attract the attention of would-be photographers. Numbers of chemists have applied to us for a list of goods which we considered most saleable, and we have always given this with pleasure, and will do so again to anyone who writes us on the subject.

* * * * *

Mr. Jonathan Fallowfield, 146, Charing Cross Road, London, W., who publishes the well-known 'Photographic Annual,' which gives the very fullest information of every possible requirement, strongly advises all chemists, when they begin to sell photographic goods, to keep just as little as possible. Once they gauge their requirements they can then order in larger quantities. Over 1000 chemists acting as his agents find this the best plan.

* * * * *

Messrs. Airs and Co., of 152, Farringdon Road, W.O., makers of the "Bessus" specialties, state that, excluding the net profit on photographic apparatus, the presence of photo goods draws new customers. Chemists should stock the most asked for brands of dry plates, films, and printing papers in silver and bromide lines, standard sizes $\frac{1}{4}$, $\frac{1}{2}$, and $1\frac{1}{2}$; a few dishes in xylomite and porcelain, flash lamps, and two or three hand cameras of useful and known success. Then there are many other small, useful, and cheap lines much asked after, concerning which information can be received from dealers and others.

TEN PER CENT. PHOTOGRAPHIC SOLUTIONS.—Dr. A. W. Bracklock considers that the recommendation to use measures graduated to fluid grains in preparing these solutions seems particularly absurd. "What is wanted is a method of making solutions so that a given bulk shall contain a certain weight, because much time and trouble is saved by substituting measuring for weighing. This purpose is accomplished by making the solutions of such strength that ten minims in bulk shall contain one grain in weight. As the ounce avoirdupois contains 437.5 grains, one ounce must be dissolved in sufficient water to measure 4375 minims, which is nine fluid ounces and 55 minims, probably nine fluid ounces and one drachm would be accurate enough, being only five minims too much."—*Photography.*

FORMULÆ AND PRACTICAL DIRECTIONS.

[The formulae and directions for working here given are specially compiled for pharmacists by a practical chemist and photographer, who will be pleased to supply any special information required, or answer photographic queries. Letters should be addressed "Editorial Department, 17, Bloomsbury Square, W.C.," with the word "Photography" in upper left-hand corner of envelope.]

SOME STANDARD STOCK SOLUTIONS.

Pyro Solution.

Pyrogallie acid	1 oz. (avoir)
Potassium metabisulphite	1 oz.
Distilled water to make	9 oz. 55 m.

Dissolve the metabisulphite in 6 ozs. of the water, open the bottle of pyro and pour on to it the solution of metabisulphite, add sufficient water to make up the full bulk and bottle immediately. This should not be filtered.

The alkali to be used with this may be either ammonia, soda, potash, or preferably, the new salt—sodium tribasic phosphate (see below)—and a 10 per cent. solution should be made, using liq. ammonia '890, sodii carb. B.P., or potassii carb. B.P. Besides these a third solution, 10 per cent. of potassium bromide, will also be required.

The pyro solution should be put up in a 10-oz. flat, the alkali in a 10-oz. oval, and a 4-oz. bottle of the bromide will be sufficient to form a set of developing solutions which can be sold for 3s. and yield a far more handsome profit than a patent medicine.

Citrate Restrainers.

The use of the citrates of ammonium, potash, and soda, is increasing, their action being different to that of the alkaline bromides, and the amateur photographer always finds a trouble in making these. The chemist will have no trouble, and the B.P. formula for liq. ammon. cit. fort. may be adopted as the basis, and the amount of resultant citrate calculated out, and the directions for diluting so as to form a 10 per cent. solution printed on the label.

Metol Developers.

At the present time some of the newer reducing agents are far more in favour with amateurs, particularly for hand camera or instantaneous work, and the following typical formula has proved very successful:—

Metol is possibly an unknown salt to many chemists, but it is the sulphate, chloride, or oxalate salt of mono-methyl-para-amido-meta-cresol, and it is an extremely energetic reducing agent, and gives negatives of great softness and full of gradation which are suitable for printing on all papers, and which are quite free from stain. The only disadvantage it has is that it sometimes attacks the fingers, producing with constant use an eczema-like eruption, followed by desquamation and subsequent thickening of the cuticle. If this appears, the only thing to do is to immediately throw up metol and apply locally ung. hyd. nit., acid carbolie, and lanoline. It is simply due to idiosyncrasy, and some people can use it for months without any trouble, whilst others are attacked at once; and generally when the eruption has been once acquired, it is impossible to use metol even for one plate without irritation of the skin and small vesicles immediately showing.

The developer is as usual in two solutions.

Metol and Hydroquinone Solution.

Metol	80 grains.
Hydroquinone	120 grains.
Sodium Sulphite	$1\frac{1}{2}$ oz.
Distilled water to	10 ozs.

Dissolve in the above order.

The Alkali.

Sodium tribasic phosphate	300 grains.
Distilled water to	10 ozs.

For use, mix one part of the metol solution with three parts of the alkali. It will be noticed there is no bromide suggested, and for instantaneous work it is advisable to omit it. For time exposures, one grain of bromide of potassium may be added to each ounce of developer.

Sodium Tribasic Phosphate.

M.M. A. and L. Lumière and Seyewitz have introduced this salt to replace the usual alkaline caustics and carbonates, and from practical trial I can strongly recommend it

as giving not only fine detail and gradation, but also good density with less risk of fog and frilling than with the other alkalis. Its formula is $\text{Na}_2\text{PO}_4, 12\text{H}_2\text{O}$, and theoretically 132 parts correspond to 100 of sodium carbonate crystallised, $\text{Na}_2\text{CO}_3, 10\text{H}_2\text{O}$; 100 parts of water at 59°F . dissolve 16 parts of the tribasic phosphate, but its solubility increases enormously with rise of temperature, and 100 parts of boiling water dissolve 280 parts. Messrs. Fuerst Bros., 17, Philpot Lane, are the English agents for it, and the price is 1s. per lb. retail.

Chloride of Gold.

Somehow one always grudges paying for gold chloride, and the following method may be adopted for home manufacture, and a considerable saving effected if you can sell ready prepared toning baths, or even a simple solution of chloride of gold, which is guaranteed to keep, ought to sell well.

Take an Australian sovereign, bend it or cut it until you can slide it into a test tube, and pour on it 1 drachm of nitric acid and 3 drachms of hydrochloric (both, of course, the B.P. pure). Place the test tube in a cup or gallipot half full of hot water on the kitchen range or sitting-room hob, so that the nitrous acid may go up the chimney. After some time it will be found that the sovereign will have diminished considerably, and if on replacing the now cooled water with fresh hot no more gas is evolved, pour off the solution and add a fresh lot of acid. Repeat this till the whole of the sovereign has disappeared, and nothing but a little white precipitate remains at the bottom of the test tube. This is silver chloride, Australian sovereigns being alloyed with silver, which of course forms chloride, insoluble in water, with the hydrochloric acid. Now place the whole of the solution in a porcelain dish on a water bath and boil up, if this can be done over the kitchen fire so much the better, as the purpose of heating is to drive off the excess of acid, which is not pleasant flying about a shop. When the heat has been applied for some time the solution may be removed and diluted with distilled water till it measures 174 fluid drachms the total bulk, and every drachm will contain 1 grain of pure chloride of gold.

Note.—When making chloride of gold never apply direct heat to the test tube or evaporating dish; always use the water bath. If the tube does break then you can save the gold. Also, chloride of gold is sensitive to light, therefore the stock solution must be well protected.

Now as most commercial samples of chloride of gold are sold in 15 gr. tubes at 2s. each, which bear a label "guaranteed to contain 7 grains of pure gold," it is not difficult to calculate out the profit. In round figures the above solution will represent sixteen tubes of commercial gold chloride:

Sixteen tubes at 2s. each = 32s.

One sovereign = 20s.

Acids and time = 1s.

21s.

Bottles, labels, etc. 1s. 22s.

22s. 10s. profit.

Query.—Is this better than patent medicines? The following may be the label:—

Solution of Chloride of Gold.

Every fluid drachm contains 1 grain of pure chloride of gold. Fifteen drachms are equal to 10 grains of pure gold; most commercial samples of chloride of gold only contain 7 grains of pure gold in 15 grains.

Directions for use.—Before use add sufficient precipitated chalk to make the solution permanently cloudy after well shaking, then allow to stand ten minutes and dilute with water, and add the requisite quantity of acetate, borax, or sulpho-cyanide to form the usual toning bath.

The Sulpho-cyanide Toning Bath.

At the present time when gelatino-chloride printing out papers, or as they are familiarly called P.O.P., are so much in vogue, a concentrated toning bath should sell well. So many amateurs make a big muddle over this bath, and will readily buy one which is already mixed and merely requires diluting with water to be ready for use, with the advantage that any quantity may be made up even for one or two prints, that it ought to be a good selling line.

Take of chloride of gold, 15 grs., if the solid salt, add to it $\frac{1}{2}$ oz. of distilled water. Of the solution recommended above take an equivalent quantity, in either case add precipitated chalk and shake thoroughly, allow to stand half-an-hour to completely neutralise any acidity. Now dissolve $\frac{1}{2}$ oz. of sulpho-cyanide of potassium in $\frac{1}{2}$ oz. of distilled water. Filter the gold solution through a small filter paper. When it has all run through filter the sulpho-cyanide solution through the same paper into the gold solution, and then wash the filter paper with sufficient distilled water to make the solution measure 45 fluid drachms. The solution will be thick and deposit on standing an orange-yellow precipitate, which is sulpho-cyanide of gold. Bottle the solution and precipitate, and label. "Shake the bottle."

As this sulpho-cyanide of gold is in itself a light sensitive salt, chemists who wish to keep it in stock should pack it in cardboard cases, or else wrap it up in deep ruby red, or brown wrapping paper.

Concentrated Sulpho-cyanide Gold Bath.

Every three drachms of this bath is equal to 1 grain of pure chloride of gold which is sufficient to tone half a sheet of P.O.P.

For use, dilute 3 drachms with 8 ounces of warm distilled water, and use when cool. Place the prints as taken from the printing frame into salt, 2 ounces; water, 20 ounces; allow to remain for five minutes, then wash for five minutes in running water and tone. Then fix.

Photographic Notes.

CARBON PRINTING.—E. W. Foxlee recommends photographers, as a timely precaution, to test carbon tissue for sensitiveness as well as solubility, so as to ensure correct exposure. Carbon tissue, he points out, from the time it is dried, whether it is manufactured in the sensitive state or is sensitised afterwards, keeps on increasing its sensibility until the time it becomes insoluble and useless. Therefore it is always advisable to ascertain how sensitive it really is at the time of using. A simple way of doing so is to select a small negative, one that is not very dense, and keep it in a printing frame specially for this particular purpose. Place a piece of the tissue behind it, and make a print, giving always one and the same exposure, say two or three tints by the actinometer that is in constant use. When printed, mount it on a bit of single transfer paper and develop. According as the print is over or under-exposed so, after very little experience is gained, will the sensitiveness of the tissue be gauged to a nicety. In carbon printing, as is well known, there is great latitude in the exposure, as any errors, within very wide limits in either direction, can be remedied in the development. But when the exposure is approximately correct, a great deal of time and trouble will be saved in the development of the prints, and correctness can always be ensured by adopting the simple expedient here referred to. As a rule, supposing the tissue has been dried under ordinary conditions, it will, for general purposes, be found to work better when it is a few days old than when it is freshly sensitised. As to the keeping properties of the tissue nothing definite can be said, as all must depend upon the conditions under which it is kept. Some explanation of those conditions and their influence may, however, be desirable. Tissue may be sensitised one day, and become quite insoluble in a couple of days afterwards, or it may be kept in a perfectly soluble condition for many months. The writer has kept it for six months, and it was then as soluble as it was at first. He considers that the chief factor in the case is moisture. "If the tissue is not properly dried in the first instance, or is allowed to absorb moisture afterwards, it will quickly deteriorate. If, on the other hand, it is made thoroughly dry, and is kept so, it will keep its solubility for a long period. In the case of its being kept six months, the tissue was completely desiccated in a pure atmosphere, and then stored in a hermetically sealed metal case. Tissue that has taken a long time in drying will not keep so well as that which is dried quickly; neither will that which is sensitised in a strong bath remain soluble so long as that more weakly sensitised. However, tissue, if dried and kept under average conditions, will remain in good work-

ing order for from one to three weeks. As a rule, tissue that is sensitised in the making keeps longer than that which is sensitised afterwards."—*Autotype Notes and Photography*.

GLOSSING PLATES.—T. Rogers states that a brilliant surface may be imparted to any gelatin paper, whether bromide paper or gelatino-chloride, by proceeding as follows:—"Prepare a sheet of glass of brilliant surface, absolutely free from scratches, and absolutely clean. Warm the plate slightly, and rub roughly over it a lump of pure beeswax. Take a dry, soft flannel rag, warm the plate until the wax melts, and with the rag rub it all over the plate until every portion of the glass is covered. As soon as you are sure of this, commence to rub the wax off again on to the flannel, rubbing slightly in a circular direction, and all over the plate, so that one portion is not left thick with wax when another portion is clean glass. When the wax has almost disappeared from the glass take another flannel, clean, to give a final polishing. Use this exceedingly lightly, and stop as soon as ever the wax becomes invisible over the whole surface of the plate glass. At this stage the glass will be evenly coated with an invisible film of wax, and will have a most brilliant surface. Further rubbing or hard rubbing would entirely remove the wax from portions of the surface, causing the prints to stick to such portions. Take the prints wet from the final washing, let them drip, then lay them one at a time, face downwards, on the plate glass, gently but firmly pressing them into contact, and removing all air-bells by the application of the squeegee. When all the prints have been squeegeed on to the glass, it can be stood on end in a dry, slightly warm place, and when quite dry the prints will peel off by themselves. If the waxing is properly done, the prints should leave the glass perfectly clean. Polish it with a dry rag, and it is ready for next waxing. If thoroughly and carefully waxed, about a dozen times of using will get the glass into a 'ripe' condition, so that several batches of prints may be squeegeed on to it without further waxing. If, when quite dry, the prints stick to the glass so as to tear in drawing off, it proves that the waxing was inefficient."—*English Mechanic and Photography*.

ORTHOCHROMATIC PLATES AND PHOTO-MICROGRAPHY.—A writer in the *Glasgow Evening Citizen* says that in photo-micrographic work the advantages of orthochromatic plates are perhaps more apparent than in any other branch of photography. With their aid the microscopist is now enabled to photograph many subjects that in years past were beyond the capabilities of collodion or an ordinary gelatino-bromide dry plate. "Among such subjects may be mentioned the sting and poison-sac of the honey bee, which, when stained, range in colour from a bright and dark yellow to the most delicate blue. With the employment of an intermediate shield of yellow or canary-coloured screen, orthochromatic plates render these colour values most admirably, the only drawback being the coarseness of the grain in the resulting negatives. Were makers to put upon the market an orthochromatic plate of a less exalted degree of sensitiveness, whereby the coarseness of the grain would be much reduced, microscopists would eagerly accept such as a further distinct advance."—*Photography*.

GRAPE FRUIT AS A TONIC.—Grape fruit, plump and juicy, is in market again, a harbinger of spring. This fruit is an admirable tonic, as well as a most appetising breakfast or luncheon relish. A doctor says that the sharp stimulus of fruit is the best thing to set the digestive organs in order for the day, and the peculiar properties of the grape fruit give it marked medicinal value. When eaten at luncheon it is prepared in a different way than for breakfast service. For the second meal the contents of two halves should be scraped out, the seeds and tough cone of dividing skin taken out and the pulp and juice thus obtained used to fill one of the halves, which it will just about do. A tablespoonful of sugar and one of rum or sherry mixed with the juicy pulp adds the perfecting flavour. At breakfast, with the long-pointed orange spoon, the meat is eaten out as is that of an orange, and very little sugar is used, many persons preferring none, on the ground that its full medicinal value is better obtained.—*Popular Science News*.

THE EXHIBITORS' ASSOCIATION.

A general meeting of about forty exhibitors was held on Wednesday, May 15, 1895, at Upton's Restaurant, 91, Strand, with the object of hearing the report of the Exhibitors' Committee.

Mr. Rebman, chairman, stated that in response to an invitation from Dr. Oswald, the four following members of the Exhibitors' Committee waited on the British Medical Association Museum Committee:—Messrs. Rebman, Stroud (Richards and Co.), Shorrocks (Bovril, Limited), J. Weiss (Weiss and Son), these gentlemen being selected to represent respectively books, drugs, foods and instruments.

The Museum Committee was thus constituted:—Dr. Tizard, Chairman; Dr. J. W. J. Oswald, Secretary; Mr. George Brown, Mr. R. J. W. Oswald, Dr. W. Murrell, Mr. J. C. Wilkin, Mr. Hugh Kerr, Dr. Danford Thomas, Dr. Willcocks, Mr. Andrew Clark, Mr. George Easton, Mr. J. Brindley James.

Mr. Rebman regretted to say that he could not make a report of absolute success, as with regard to the question of price for space and the question of tenders, the Committee found it impossible to induce the Museum Committee to give way, more particularly because many tenders and applications for space had already been received.

The Museum Committee readily agreed to raise the limit of height above central tables to 3 feet 6 inches, and above wall tables to 4 feet 6 inches.

They also agreed to consider no applications, other than tenders for yellow space, before June 1, and to exclude the general public and to mix the exhibits.

The Museum Committee, in discussing the third object of the Exhibitors' Committee, brought forward the question of sub-letting space, and desired the assistance of the exhibitors in preventing this. It was understood that should the applications for space exceed the available, an equitable reduction *pro rata* would be made.

The Museum Committee thanked the exhibitors for drawing their attention to storage of packing cases—a matter which had escaped their notice. It was understood that the basement would be available for the purpose, and that the hall would be accessible to exhibitors for erecting stands, etc., by the Friday night preceding the meeting.

The meeting asked the Secretary to write Dr. Oswald, suggesting that the basement be divided into spaces marked alphabetically; those firms whose names began with A storing their packages on space "A," and so on.

Mr. Rebman reported an interesting interview with Mr. Ernest Hart, editor of the *British Medical Journal*, who stated that the desire of the Executive of the British Medical Association was decidedly to place the exhibition on a fair footing, and engender good feeling.

The Chairman stated that he had written the President of the British Medical Association Council for an interview, to discuss the advisability of appointing a permanent Secretary, to act as adviser to the Local Committee.

Mr. Blau (Hoff's Malt Extract Company) proposed, and Mr. Ball (Burroughs, Wellcome and Company) seconded the following resolution, which was carried:—

"That a Committee of twelve be formed with a view to the drafting of rules by which the Association would be governed."

To this resolution it was subsequently added, "That the signatures of the principals of firms joining the Association should be obtained to these rules."

The following Committee was elected:—Mr. Ball (Burroughs, Wellcome and Co.), Mr. Longmate (Allen and Hanburys, Limited), Mr. Hickey (Parke, Davis and Co.), Mr. J. Weiss (John Weiss and Son), Mr. Down (Down Brothers), Mr. Shorrocks (Bovril, Limited), Mr. Rebman, Mr. Essinger (Hartmann's Sanitary Wool Wool Company, Limited), Mr. Arthur (Arthur and Co.), Mr. Blau (Hoff's Malt Extract Company), Mr. Mayer (Mayer and Meltzer), Mr. F. W. Van Abbott (Van Abbott and Sons), Mr. H. W. Lane (Armour and Co., Hon. Sec.).

Subscriptions have been received from a number of firms, entitling them to active participation in the Association.

The meeting closed with votes of thanks to the Chairman, Hon. Secretary, and to Mr. Geery, the proprietor, for the kind use of the room.

THE IMPERIAL INSTITUTE EXHIBITION OF PHOTOGRAPHY.

This exhibition, which has been organised by the United Kingdom section of the Imperial Institute, was opened to the public on the 11th inst. It is to be regretted that the general arrangements were not entrusted to those members of the Committee of Advice who, from their practical knowledge, were most competent to have made the exhibition a huge success, and really representative of photography in all its branches. As it is, a large number of would-be exhibitors have held aloof owing to the extravagant terms which the authorities wished to impose upon them, and one looks in vain for many names which are bye-words in the trade. These difficulties could readily have been overcome, had a little more tact been displayed by the promoters, who ought by now to be alive to the fact that a policy of "give and take" is absolutely essential to success. In spite of these drawbacks, the exhibition contains much that is of interest, although it is doubtful whether it will be much patronised by the general public. The larger portion of the exhibition, comprising the portions devoted to photography from an educational and industrial standpoint, is arranged on the ground floor in the North Gallery, and is now fairly complete.

Commencing at the east end, the astronomical section first claims attention. This includes a large collection of photographs lent by the Royal Astronomical Society, illustrative of spectra of stars and nebulae, as well as various stellar, lunar, and solar photos. The Observatory at Cambridge University also show a set of lunar photographs, whilst various meteorological series have been lent by A. W. Claydon, Col. Saunders, and others. The next section, which illustrates the uses of photography applied to various sciences, contains much of interest. Mr. Frederick Iles, of Birmingham, shows a beautiful set of stereo-micrographs, several of which are of interest to the pharmacist, and a series of prints sent by Messrs. Fuerst Brothers illustrates the correct colour rendering obtained from Lumiere's ortho-chromatic dry plates. Mr. Charles Baker shows a complete set of photo-micrographic apparatus for demonstration purposes, whilst a series of photographs of a splashing drop sent by Professor Worthington are of considerable interest. In this section an attractive exhibit is a set of photographs of explosions of boilers, powder magazines, etc., lent by the Home Office.

The next two sections, comprising the photo-mechanical and photo-ceramic work, are the most interesting in the whole exhibition. The arrangements have here been carried out by Messrs. H. Snowden Ward and E. J. Wall, upon whom they reflect great credit. Three-colour printing has received especial attention, and includes specimens of the work by almost all the leading producers of the day, as well as the actual blocks, plates, etc., used in the processes. The results now obtained by this method are simply marvellous, and indicate the high standard in artistic work which photography has now attained. The principle adopted in all cases is practically the same, and this style of printing seems destined to supersede chromo-lithography, since it produces results which are more delicate in colouring and more truthful to nature. In America, the process has been utilised for printing the patterns of coloured rugs and carpets, so that commercial travellers can show these to their customers instead of the ordinary cumbersome samples.

The British Fine Arts Society, Limited, shows a fine collection of photographs after Raphael, Reynolds, and other masters, some of which are taken direct in colours by the "Mathieu process," whilst others illustrate the "Mathieu hand process" in colours. The photo-ceramic division is very complete, and demonstrations are given on Monday, Thursday, and Saturday evenings by Mr. W. Ethelbert Henry, illustrative of the whole process by which photographs are reproduced on china and enamel. There is, of course, nothing new in this process, the object of the demonstration being to popularise a method which has hitherto been jealously kept in the hands of a select few for the sake of extra profit. Even now, however, the prices have been enormously reduced, and will be more so as the process becomes more general. Mr. Henry's demonstration includes the preparation of the film, coating the plates, exposure,

development by vitrifiable powder, and transfer to china, copper, or glass. Finally, the pictures are fired in a Fletcher's gas furnace. The colours used in the process are all made by G. P. Emery, of Cobridge, Staffs. In this section Mr. Henry, amongst other representative exhibits shows a number of specimens of photo-ceramic work as well as a case of "failures," which are very interesting. It should be mentioned that a tea service, each piece of which bears a photo taken by a detective camera and reproduced by enamelling, has been lent by the Princess of Wales. This attracts a considerable amount of attention, although it will not bear comparison with similar exhibits in this section.

The photo-mechanical section is very good. It includes a large number of specimens of three-colour work, whilst Messrs. Mawson and Swan show photo-mechanical plates and negatives taken upon them. Progressive series, illustrative of the production of a photogravure print, collotype work, the fish glue half-tone process and ordinary line and half-tone engraving are shown. In this section Messrs. Fuerst Brothers and others show colour screens for use in ortho-chromatic work.

The next section is mainly devoted to exhibits from the *Graphic and Black and White*, showing progressive stages of wood engraving, and half tone work, as well as a set of large transparencies. In this room, also, Captain E. H. Hills shows a series of illustrations of the determination of longitude by photography, whilst the manufacture of lenses, from the rough state through all the stages up to the finished article, is well depicted in Charles Burr's exhibit.

The seventh section attracts a good deal of notice, as the Polytechnic Institute has an exhibit here showing the photo-engraving process in all its details, whilst further on Waterlow and Son, Limited, have the most elaborate exhibit in the whole of the photo-mechanical division, the processes for collotype and woodbury-type printing being practically illustrated. Further on, the Swan Electric Engraving Co. have a good assortment of electrogravures, as well as a press for printing photogravures. Edward and Co.'s stand claims attention on account of the aluminium tripod stands which they have recently introduced, and bid fair to come into general favour. Messrs. A. and M. Zimmerman, Cross Lane, E.C., have the largest exhibit in the ninth section, their handsome case being filled with various photographic chemicals of Schering's manufacture, the most important being hydrokinone, pyrogallio acid, xyloidin, and anthion, the latter being a permanent alkaline sulphite which is said to give extremely satisfactory results. Demonstrations of the fountain air brush invented by Mr. Chas. Burdick are given thrice weekly by the inventor in this section. The most prominent feature in J. H. Steward's show is the arc lamp for use with ordinary lanterns, which is made according to Davenport's patent.

Airs and Co. have a neat exhibit of their various "Bessus" specialties, including the plate, film holder and binomial lantern. Amongst the other stands in this gallery it may be mentioned that Messrs. Penrose and Co. have the most complete exhibition of apparatus and tools shown, embracing as it does a photo-mechanical studio, and all kinds of apparatus and materials for photographic process work. Their "Elliptograph" for tracing or cutting mounts deserves attention. With regard to the historical and artistic sections of the exhibition, which are situated in the central gallery, little can be said, except that they are somewhat disappointing.

The Blackfriars Photographic Company show the Anschütz instantaneous camera, for which they are agents. An old "Kodak" exhibited by the Eastman Photographic Materials Company, is interesting when compared with the latest modification of the same makes of camera, and demonstrates the improvements and modifications that have been introduced in the interval. The "Kodet" is also in evidence from the same firm, and the recently introduced "Kombé" is shown both in its complete form and in sections. Watson and Sons, are also represented, and B. and J. Beck, of Cornhill, are brought into prominence with their "Frena" camera.

On the whole the exhibition is well worth a visit, as it is certainly far in advance of anything of the kind which has been attempted before.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, MAY 23, 1895.

Changes in the chemical market since our last report have not been very extensive. Tartaric acid is hardly so firm, and quotations are fractionally less. This applies also to sulphate of ammonia. Cream of tartar remains steady at unaltered rates. With regard to potash salts, business in chlorate, both in London and Liverpool, has been very brisk at advanced prices; prussiate, however, is considerably lower. Full details will be found below:—

ACID, CARBOLIC.—The market generally is very firm, and higher prices have been paid all round. Crystals especially have been in brisk demand at the following rates:—34° to 35° C., 6d. per lb; 39° to 40° C., 6½d. per lb.; 39° to 40° C. (detached crystals), 7½d. per lb. These quotations are for crystals in 2-ozt. drams. Crude 60 per cent. is quoted at 1s. 8d., with 75 per cent. at 1s. 10d. Cresylic, 95 per cent., at 1s. 1d. per gallon.

ACID, CITRIC.—Has been in steady demand at unchanged rates, the quotations being maintained at 1s. 1¼d. to 1s. 2d., according to quality.

ACID, OXALIC.—Makers maintain the price at 3¼d. net ex rails, and a fair amount of business has been done at this rate.

ACID TANNIC.—Steady at unchanged quotations. The price for B.P. Leviss is at present 1s. 7¼d. to 1s. 7½d. per lb. in 1-cwt. cases, and the market is firm at these rates.

ACID, TARTARIC.—Somewhat easier, and quotations are fractionally less. English manufacturers now quote at 11d., with Kembell's make at 11½d., whilst for foreign brands of acid, both in powder and crystal, 11d. would be accepted.

AMMONIA SALTS.—Hardly so steady. Carbonate remains unchanged at 3¼d. to 3½d. Liquor, steady at 8d. to 8½d. Sal Ammoniac.—The quotation for first quality is maintained at 89s., whilst seconds are worth 87s. Sulphate: A weak market throughout the week, and closing prices are 5s. lower than when last reported. Grey 24 per cent. is now worth £10.

ASHES.—Fairly steady at unchanged rates, American being still worth 40s., with pots at 28s.

ARSENIC.—Unchanged, and good white powder is still worth 15s.

BLEACHING POWDER.—In steady demand, and the market is firmer. £7 to £7 10s. has been paid in London, whilst in Liverpool the quotations range from £7 10s. to £7 15s., f.o.b.

BORAX.—The demand is but moderate, and Syndicate prices are maintained at 20s. for crystals, with powder at 21s. Second-hand holders, however, offer at 1s. to 1s. 6d. less.

COAL DISTILLATION PRODUCTS.—Benzole: 50 per cent. is steady at 1s., whilst 90 per cent. is also unchanged at 1s. per gallon. Pitch firm at 36s. per ton, f.o.b. Tar: Stockholm, 21s. to 21s. 6d.; Archangel, 15s. 6d.; ordinary, 11s. 3d.

COPPER SULPHATE.—Sales have been fairly extensive, and prices are somewhat advanced. Quotations range from £15 to £15 10s., according to brand.

CREAM OF TARTAR.—A steady market, without any alteration in price. German makers' quotation for powder remain at 72s. on the spot, whilst best white French crystals are worth 70s.

MERCURIALS.—The current quotations for qualities up to 56 lbs., in accordance with the advance noted last week,

are as follows:—Calomel, 2s. 11d.; corrosive sublimate, 2s. 7d.; red precipitate, 2s. 2d.; ditto (levigated), 2s. 2d.; white precipitate, 2s. 2d.; persulphate, 2s. 3d.; sulph. with sulphur, 2s. 2d.; mercury with chalk, 1s.

PHOSPHORUS.—Unchanged. Wedges being quoted at 2s., with sticks at 2s. 2d.

POTASH SALTS.—Bichromate: Quotations are unchanged at 4¼d. to 4½d. Chlorate: A large amount of business has been done at advanced rates. In London it does very steady at 4¼d. to 5d., on the spot, whilst in Liverpool 4¼d. to 4½d. has been paid. Permanganate: Small Crystals offer at 53s. 6d. to 53s. Prussiate, lower by ¼d., and at the close it is quoted at 8¼d. to 8½d.

QUICKSILVER.—Importers maintain the price £7 5s., but in second-hand it can be bought at £7 3s. 6d. to £7 4s.

SALTPETRE.—British refined is quoted at 22s. 6d. to 23s. 6d., on the spot. In Liverpool it is worth 22s. 6d. in kegs, and 23s. in barrels.

SODA COMPOUNDS.—Unaltered. Bicarbonate: £7 1s. London, whilst in Liverpool it offers at £6 15s. Caustic 70 per cent. £8, with 60 per cent. £1 less. Crystals, 82s.; Hyposulphite, £8 5s. in 1-cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, MAY 23, 1895.

Since our last report the boom in crude camphor has continued, and a considerable amount of business has been done both in China and Japan at fully steady rates. Trade in spices and shellac has also been very brisk. In the Drug Market proper Carthagena ipecacuanha has been selling at advanced rates, and this applies also to tolu balsam. Generally speaking, alkaloids and essential oils are unchanged, but cod-liver oil is very firm and advanced prices have been paid. Full details will be found below:—

CAFFEINE.—Little business has been done. Second-hand holders are asking 27s. 6d. for small parcels, but it could probably be bought for 27s.

CAMPHOR (CRUDE).—Generally the market is quiet, but steady, and business is restricted owing to the advanced rates required by holders. During the week a fair amount of business has been done in Japan at 150s., c.i.f. May to July steamer, and holders are now asking 152s. 6d. to 155s., c.i.f. Sales of Chinese gum have been made at 147s. 6d. to 148s., c.i.f., May to July, and 150s. is the price now required by sellers.

CAMPHOR (REFINED).—Unchanged, although a further advance is very probable. The current quotations for 10-cwt. lots are as follows:—Bells, 1s. 9½d.; tablets, 4, 5 or 16 ozs., 1s. 10½d.; 1 or 2 ozs., 2s.; ¼ oz., 2s. 0½d.; ½ or ¾ oz., 2s. 1d.; flowers, 5 or 10 lb. boxes, 1s. 9½d.; ditto in 1 lb. boxes, 1s. 10½d. Smaller wholesale quantities ½d. per lb. more all round.

COCAINE.—Remains at the following quotations:—For 100 ozs., 17s. 6d.; from 25 to 100 ozs., 17s. 9d.; for less under 25 ozs., 18s. These quotations are for Cocaine in tins, 1 oz. bottles being charged 3d. per oz. more.

COCA LEAVES.—Since the drug sales business has been done privately in broken Truzillo leaves of good bright green colour at 11d.

COCHINEAL.—Quiet. Privately there have been sales of black at 1s. 2d. for old import.

CODEINE.—Prices remain unchanged, the current quotations being 10s. 3d. to 10s. 9d., according to quantity and brand.

COLOCYNTH.—Good pale Turkey apple cannot be bought under 2s. per lb., and the scarcity of these best grades continues. Good Spanish is worth 1s. per lb. From New York, Trieste is reported in good demand, and steadily advancing rates, in sympathy with advices from primary sources of higher prices.

COPAIBA (BALSAM).—Very firm. For good bright cloudy Maranham 1s. 9d. is asked, and for good balsam of Para character 1s. 7d. is the figure.

GALLS.—Remain quiet but steady with sales of China on the spot at 55s.

INSECT FLOWERS.—A firm market. Hoffmann's current quotations are as follows:—Open flowers, 42s. 6d.; half-closed ditto, 69s. 6d.; closed cultivated, 95s. per cwt.; all c.i.f. London.

CLOVES.—At the sales on the 22nd inst. there was little demand, and holders were firm. For *Zanzibar* the following prices were obtained:—Ordinary dark, 2½d. to 3½d.; sidding, 3d. to 3½d.; fair, 3½d. Picked *Penang* sold at ½d., and mixed *Ceylon* at 4½d. Privately there have been moderate sales of *Zanzibar* at 3½d. to 3¾d.

CHILLIES.—Firm. At the sales the following prices were obtained. *Zanzibar*: Good light red, 30s.; fair, tatty, 25s. 6d.

INSECT POWDER.—The current quotation for *Dalmatian* powder is 70s. per cwt. in 1-cwt. barrels.

IPCACUANHA.—Sales privately of *Rio (Brazilian)* root have not been made at fully steady rates, but the demand has been chiefly for *Carthagena (Columbian)* root, in which a considerable amount of business has been done at 8s. 4d. or fair, slightly damaged root showing an advance of 1d. per lb.

JALAP.—Holders of *Vera Cruz* ask 11d. to 1s. for good sound root, and 8d. for damaged ditto.

MENTHOL.—Is still on offer at low rates. On the spot 15s. would be accepted for dry white crystals, whilst for delivery it is quoted at 13s. 6d. to 14s. c.i.f. terms.

MORPHINE.—Unchanged, the current quotations being 1s. 3d. for 1000-oz. lots, and 4s. 5d. for smaller wholesale quantities, with crystals 2d. per oz. more.

OILS (ESSENTIAL).—All *English* essential oils are steadily advancing in value, and we shall probably see very extreme prices owing to the inclemency of the weather damaging the plants. *Aniseed*: On the spot it is somewhat easier and 6s. 4d. to 6s. 5d. has been accepted during the week. For shipment, May-June, it is quoted at 6s. 5d. c.i.f. terms. *Cajeput*: Very steady at 2s. 9d. to 3s. per bottle.

Jassia: Quiet; on the spot 5s. would be accepted for oil showing 75 to 80 per cent. cinnamic aldehyde, whilst for shipment it is quoted at 4s. 9d. c.i.f. term. *Citronella*: Very firm, and as much as 13d. has been paid on the spot for oil in tins. *Juniper*: Fine Hungarian wood oil is quoted at 1s. 3d., with finest *berry* oil at 8s. *Lemon-grass*: Dull of sale, and nominally 1½d. per oz. *Peppermint*: Generally lower. *H. G. Hotchkiss*' oil is dull of sale at 9s. 6d. to 10s. 9d. *Japanese* oil containing 40 per cent. menthol is quiet at 7s. 6d. to 8s., with *dementholised* at 5s. 9d. to 6s. *Wayne County* oil is quoted at 6s. to 6s. 8d. c.i.f. term.

OILS (FIXED) AND SPIRITS.—*Castor*: Fine *Italian* oil is quoted at 80s. 6d. c.i.f. *Cotton*: Steady. £17 15s. to £18 10s. is the present quotation for refined oil, according to brand and package. *Cocoa-nut*: Unchanged. *Ceylon* is quoted at £23 15s., *Cochin* £24 10s., and *Mauritius* £22 10s. to £22 15s. *Linseed*: Quiet, but steady. The present quotation is £20 7s. 6d. to £20 10s. in barrels on the spot. *Rape*: Steady. Refined oil is worth £22 10s. *Turpentine*: Firm. *American* spirits are worth 22s. 4½d. to 22s. 6d. on the spot. *Petroleum*: *American* oil is quoted at 6½d. to 6¾d. *Water White* 7½d. to 8d., and *Russian* 5½d. *Petroleum spirit*: Ordinary, 8½d. to 8¾d.; *deodorized*, 9½d. to 9d.

OILS (COD LIVER).—*Isdahl*'s report states that the *finmarken* fishing has so far been a failure, the fish being very meagre, and the livers yielding but little oil. The *Bergen* market is very firm, and 165s. has been paid for *Isdahl*'s oil, 170s. being now asked in some instances. Holders of other brands of oil are asking 160s. to 165s. per barrel of 25 gallons.

OPIMUM.—Generally the market is dull, but all grades of *Persian* are very firmly held. During the week 12s. 9d. has been paid for first quality, with *seconds* at 10s. 6d. for *Turkey* opium the quotations are more or less nominal, *soft shipping* descriptions being quoted at 11s. 3d. to 11s. 6d.; *best druggists*, 9s. 6d. to 10s.; *seconds ditto*, 8s. to 9s.

ORRIS ROOT.—The quotation for finest selected *Florence* root is 76s., with *Vere* at 57s. per cwt. c.i.f. term.

PERU BALSAM.—Continues firmly held at 9s. 6d. per lb. for good quality balsam.

PILOCARPINE.—Although the manufacturers quote at 6d. to 8s., it can be bought in second-hand at 6s. 6d. or gramma. There are no enquiries.

QUASSIA.—A fair amount of business has been done at 14 15s. to 25s.

QUININE.—Very firm at advanced prices. During the week there have been sales of 10,000 ozs. of *H. B.* at

1s. 0½d., 5,000 ozs. *H. B.* and *B. & S.* at 1s. 1d., October delivery. On Monday 10,000 ozs. of *B. & S.* and *Brunswick* sold at 1s. 0½d. on the spot, with 1s. 0½d. paid for 10,000 ozs. of the same brand, July delivery. At the close holders of the best *German* brands are asking 1s. 0½d. to 1s. 0¾d. on the spot, and 1s. 0½d. to 1s. 3¾d. for July delivery.

SAFFRON is still dull of sale, and quotations have been further reduced. Super extra *Valencia* is quoted at 24s. 6d. per lb.

SALICIN.—Steady at unaltered rates, makers' prices being 8s. for 1-cwt. lots, with 28 lbs. at 8s. 6d.

SANTONIN.—The current price is 5s. 4½d. per lb.

SHELLAC.—Privately sales have been small, but the market is steady. *CCC. Garnet* has been sold at 108s., whilst for *Second Orange*, May-June and August-October shipments, 120s. to 126s. c.i.f. has been paid. At the sales on the 21st inst. the prices obtained were somewhat irregular. Quotations: *Fine Second Orange*, *Cakey DJ.*, 137s., *Block AA*, 129s.; worked *D.J.*, 124s. to 128s. *TN. Orange*: From 117s. for dark livery block up to 129s. for good light unworked. *Garnet*: Good *AC.*, 110s., fair *AA*, 106s. *Button*: From 100s. for dark *BJ.* up to 120s., for blocky ditto.

SOY.—Fair *China* is dull of sale at 1s. to 1s. 1d.

TOLU BALSAM.—Dearer, and 1s. 5d. is now asked privately for good quality balsam.

Advertisements in the Pharmaceutical Journal.

ALL ADVERTISEMENTS must be sent to the Office, 5, Serle Street, Lincoln's Inn, W.C., where replies to prepaid advertisements may be addressed, and will be redirected free of charge. Postal Orders should be made payable at Lincoln's Inn, W.C., to STREET BROS. Cheques should be crossed "London Joint Stock Bank."

PREPAID ADVERTISEMENTS.—Advertisements of Assistants Wanted, Apprenticeships, For Sale, Partnerships, Businesses for Disposal, Businesses Wanted, and Premises to Let are charged as follows:—Fifty words or less, 3s. 6d. Each additional ten words or less, 6d.

ADVERTISEMENTS of a general character are inserted at 4s. 6d. each for seven lines (50 words) or less, and each additional line of seven words, 6d.

FREE ADVERTISEMENTS.—Advertisements of Assistants seeking Engagements will be inserted Free of Charge, subject to conditions mentioned in each number of the Journal.

EDINBURGH PHARMACY ATHLETIC CLUB.—There is a large entry for the Pharmacy Athletic Club Sports at Powderhall on Tuesday next, May 28. A. B. Downie, at present the fastest runner in Great Britain, is to compete in the 120 yards' and 150 yards' invitation race in an attempt to break the Scottish record.

PHARMACY IN KENSINGTON.—The once dirty old chemist's shop in Church Street, Kensington, which would have required the pen of a Dickens adequately to describe, has assumed an entirely different appearance since the advent of Mr. Back, who evidently has no faith in "looking backward." The former proprietor, whose melancholy end will be in the memory of your readers, had an unfortunate knack of looking after the business of his neighbours, while neglecting his own. This order of things has been reversed by the new proprietor.—*Kensington News.*

PHOTOGRAPHY AND THEFT.—The *American Journal of Photography* relates that in the course of transit between New York and New Orleans a packet of paper money was opened and its contents considerably reduced. Two of the seals were broken and one had been re-sealed by thumb pressure. Mr. Carvalho, an expert in matters of identification, obtained wax impressions of the thumbs of all the officials of the American Express Company through whose hands the packet was known to have passed. The impressions were photographed and enlarged, and the thief was detected through one of them clearly agreeing with an enlarged photograph of the thumb-impressed seal.

Trade Notes.

THE LIEBIG'S EXTRACT OF MEAT COMPANY, LIMITED, send the report and statement of accounts to be presented at the thirtieth ordinary general meeting of the company, on June 6. The business appears to be increasing considerably, and the balance of the profit and loss account for the year amounts to £85,316 7s.

Mr. WILLIAM SHEPPERSON, of the Liquor Carnis Company, has just been the recipient of a handsome diploma of honourable mention, awarded to him by the Board of Lady Managers of the World's Columbian Commissioners, in recognition of his skill as a designer and inventor.

Messrs. MARION AND Co., of Soho Square, W., are having a stock-taking sale, which should afford an excellent opportunity of getting bargains in photographic appliances.

Messrs. LOMAN AND Co., of 182, Gresham House, Old Broad Street, London, E.C., the makers of the "Reflex" and "Premier" magazine hand cameras, have converted their business into a limited liability company, under the name of the "Reflex Manufacturing Co., Ltd."

Mr. J. H. HART, pharmaceutical chemist, Clevedon, has completed a convenient dark-room for the use of customers.

THE PLATINOTYPE COMPANY, of 22, Bloomsbury Street, W.C., recommend their platinum paper as making the most perfect transparencies for window decorations, etc. They are also issuing a new kind of paper, pictures printed on which can only with difficulty be distinguished from photogravures.

Mr. THEODORE BROWN, Fisherton, Salisbury, has invented a stereoscopic transmitter which enables two dissimilar or stereoscopic views to be obtained at one exposure in a fixed monocular camera.

Messrs. A. and M. ZIMMERMANN, of 6 and 7, Cross Lane, St. Mary-at-Hill, London, E.C., send an original bottle of Dr. Aronson's diphtheria antitoxin. This has been tested, approved, and sealed with lead by the bacteriological department of the German Government, and is from the first supply of this kind of serum arrived in this country. The presence of the seal indicates the State guarantee, and the medical profession can thus depend upon the quality of this important addition to the materia medica. The bottle itself bears, besides the lead seal, on the top and also outside the cover, the initials and date of examination. The control is carried out with considerable strictness in Germany, and a special charge is made to the manufacturers, which, of course, has to be debited to the cost. A slight addition of trikresol to the antitoxin is allowed to enable the antitoxin to keep good for twelve months.

Messrs. F. NEWBERRY AND SONS call attention to a paragraph in the introduction to their revised annual catalogue, in which they say that should they, in the future, find that medicines are so labelled as to indicate whether any of their ingredients fall within Part I. or Part II. of the schedule to the Pharmacy Act of 1868, they will place the mark "(P)" against those goods.

Messrs. BURROUGHS, WELLCOME and Co., of Snow Hill Buildings, London, E.C., supply compressed reagents for photographic purposes, which should prove exceedingly useful at times, on account of their extreme portability. The developing "tabloids" include eikonogen, eikonogen with quinol, paramidophenal, pyro-developer, pure pyrogallie acid, 1, 2, and 4 grs., pyrogallie acid with eikonogen, quinol, and quinol with pyro. Then there are accelerator "tabloids"; restrainer "tabloids"; potassium bromide, 1 gr.; and ammonium bromide, 1 gr.; in addition to toning "tabloids," of gold compound, in tubes containing three "tabloids." Amateur photographers are said to find these tabloids give uniformly good results.

Personal Notes.

Mr. P. W. SQUIRE, not content with earning laurels in the field of pharmaceutical literature, has just issued a carefully compiled "Punting Record for 1894," which forms a supplement to the annual report of the Thames Punting Club, of which he is Honorary Secretary.

Dr. THORNE THORNE, C.B., F.R.S., has been appointed by Government to the membership of the General Medical Council in place of Sir John Simon, K.C.B., resigned.

Dr. GEORGE SAVAGE is to be proposed for election as Vice-President of the Neurological Society of London in the place of the late Dr. Hack Tuke.

Dr. JOHN MURRAY has been awarded the founder's medal of the Royal Geographical Society, for his services to physical geography, and as director of the Challenger Commission.

Mr. G. F. SCOTT-ELLIOT receives the Cuthbert Peck grant from the same society, for his explorations of Mount Ruwenzori and the region to the west of the Victoria Nyanza.

LORD RAYLEIGH has been awarded the first Barnard medal for meritorious service to science, by the National Academy of Sciences (U.S.A.), for the discovery of argon.

Professor HUXLEY's health still continues to improve, and he is much stronger.

Mr. JOHN GUY, chemist and druggist, Bournemouth, Cheshire, after being in business for twenty-seven years, has retired, and is succeeded by Mr. Thomas Carter.

Mr. J. S. SHEARMAN, chemist and druggist, King Street, Great Yarmouth, has removed to more extensive premises adjoining his old establishment.

PROFESSOR JULIUS VON SACHS has been elected a foreign associate of the National Academy of Sciences. The membership of the Academy is restricted to one hundred ordinary and fifty foreign associates.

Company Business.

VALDENE CHEMICAL COMPANY, LIMITED.—Registered with a capital of £2,400 in £1 shares, by Jordan and Son, 120, Chancery Lane, W.C. Object: to carry into effect an agreement expressed to be made between E. R. Blackstone and F. R. Maggs of the first part, G. H. Hedley of the second part, and this company of the third part, and to carry on the business of a manufacturing chemist in all its branches. The directors are Edwin R. Blackstone, F. R. Maggs, and George H. Hedley. Qualification of ordinary directors £100; of managing directors £200.

MUNSTER DRUG COMPANY, LIMITED.—This company was registered with a capital of £3000 in £1 shares in Ireland. Objects: To acquire, take over as a going concern, and carry on the business of a pharmaceutical chemist, druggist, patent medicine, and perfumer, carried on under the firm or style of "James Selkirk and Co.," by James Selkirk. The registered office is 7, Pembroke Street, Cork.

MAW'S DRUG COMPANY.—Registered in Scotland with a capital of £1000 in £1 shares. Objects: To sell medicines of all kinds, including patent medicines; to sell and keep open shop for retailing, dispensing, or compounding persons or medicines, and generally for carrying on the business usually conducted by chemists and druggists and pharmacists or dispensing druggists; to manufacture and sell (wholesale and retail) all drugs and poisons, and aerated waters, medicines, etc. The registered office is situated at 173, Union Street, Aberdeen.

Exchange.

[Notices of books, apparatus, etc., for exchange, of reasonable length, are inserted free in this column. They should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C.," and must not partake of the nature of ordinary advertisements.]

WANTED.

MUTER'S 'Pharmaceutical Chemistry.' Must be in good condition.—R. M. Stewart, Chemist, Kingsbridge, Devon.

COOLEY'S 'PRACTICAL TRADE RECEIPTS.' Must be latest edition and in good condition.—State price to Elliot, Chemist, Coldstream, N.B.

No. 2 FRENA CAMERA. State condition and lowest price. Also good microscope. State price, power, maker, and date.—J. F. Smith and Co., Calverts Square, Stockton-on-Tees.

YEAR-BOOKS OF PHARMACY 1881, 1884 to 1889.—J. F. Liverseege, 292, Rotton Park Road, Birmingham.

GUN-METAL VULCANISER.—Must be complete and perfect. Bent glass counter case about 5 feet long; also upright to open at back, about 3 feet by 2 feet 6.—Collins, Duke Bar, Burnley.

OFFERED.

BOOKS.—McLaren's 'Atlas of Venereal Disease,' bound; also three parts of Witkowski's 'Atlas of Anatomy,' coloured from life. Price 60s. the lot.—Baxter, Bramley, Leeds.

PHARMACEUTICAL JOURNAL.—Twenty-seven volumes, half calf (1841 to 1868); perfect condition; cheap. Offers wanted.—Rogerson, "The Old Pharmacy," Bradford.

SELF-WEIGHING MACHINE for customers; capital advertisement; sacrifice 70s. Working model for window, about 3 feet high; cost £12, for 70s.—F. O. R. (approval), cash to Oxen, Chemist, Newcastle, Staffs.

GOLD BRONZE, 7 lb., 3s. per lb., free. Circular stand with marble top and centre pedestal for aquarium, three turned legs, with triangle base, polished mahogany, in capital condition, 15s., packed. Twenty-two pamphlets on advertising, with illustrations of electros, etc. 2s. free.—W., 44, Howard Street, Salford.

SOLID SPANISH MAHOGANY MEDICINE CHEST, fitted with every requisite, a splendid article, £2 10s.; also a well-made bonised upright show-case, £12 12s., cost double; also six dozen stoppered rounds, all sizes, sold labelled.—3, St. George's Circus, Southwark.

PORTABLE ASSAY BALANCE, with rider to carry 2 grammes each pan, turn with 0.1 milligramme, fitted in mahogany case. New to order. Received too late for customer.—Allen, Chemist, Plymouth.

BOOKS.—Vine's 'Students' Text-Book of Botany,' Part I, new, 4s.; Muter's 'Short Manual of Analytical Chemistry,' 5s.; Nägeli and Schwendener's 'The Microscope in Theory and Practice,' 4s.; Prantl and Vine's 'Elementary Text-Book of Botany,' 5s.; Strasburger and Hillhouse's 'Handbook of Practical Botany,' 5s.; Flückiger's 'Principles of Pharmacognosy,' 5s. All latest editions and in good condition.—Pharmakos, c/o Richardson, 4, Great Queen Street, W.C.

HALL'S 'EIGHT-GUINEA TYPE WRITER,' in perfect condition. Take in part exchange latest editions of Squire's 'Companion' and 'Extra Pharmacopoeia.'—John F. Bentley, Chemist, North Street, Goole.

BOOKS.—Mohr and Redwood's 'Practical Pharmacy; Faraday's 'Chemical Manipulation'; Turner's 'Elements of Chemistry,' 7th ed., by Liebig and Gregory'; Bell and Redwood's 'Progress of Pharmacy'; General View of Writings of Linnaeus, by R. Pulteney, to which is annexed the Diary of Linnaeus, written by himself (1805); 'Physiological Chemistry,' by Lehmann, 8 vols. (Cavendish Society); Atlas of above, by Otto Funke; 'Life and Works of Cavendish,' by Dr. G. Wilson; 'Life of Dalton,' by Dr. Henry.—Offers to Rose, Chemist, Jarrow.

'THE CHEMIST AND DRUGGIST,' from 1887 to 1891 inclusive; also from July to December, 1893; 11 volumes 6s. 6d.—Address, W. Gyles, 44, Guildhall Street, Folestone.

DOBSON'S BLACK-LEG DRINK, 3, 5s.; 12, 8s.; 33, 1s. 6d.; good condition, 25s. the lot, or offer for part.—Wright, Chemist, Hebden Bridge.

BOOKS.—SQUIRE (1894, 1886), Bentley, Muter, Wills, Microscopy, Dispensing. Stamp for particulars. Also Botanical Lens—s, three in frame, representing six powers. Cost 4s. 6d., offered, 3s. 8d.—3, Crosby Road, North, Waterloo, Liverpool.

A RUDGE TRICYCLE to be sold cheap, solid tyre, ball bearings, £2 10s.; worth double. Also two oil tanks, 100-gallon capacity, with lids and taps.—Smith, chemist, St. Helens.

ATTFIELD'S CHEMISTRY, splendid condition, 4s. 6d., or exchange any book on pharmacy, Wills' preferred.—Slack, 151, High Street, West Bromwich.

POTASS. PERMANG.—Five 7-lb. parcels at 3s. 9d., or 17s. 6d. if taken together. Large cup sponge, 7s. 6d., cost 12s., splendid value; cash with order, carriage forward.—Eastman, Forest Lane, Stratford.

"KODAK" HAND CAMERA; Handsome specie jar on stand; Dispensing scales on stand. All in good order.—Ingils, Chemist, Delph.

TRUSSES.—Bed baths, syringe, inhaler, spinal ice bag, several pieces of crockery in good order. Any reasonable offer accepted.—Hardie, 8, The Green, Ealing, W.

Terms for Subscription to the
Pharmaceutical Journal.

The PHARMACEUTICAL JOURNAL circulates amongst Pharmacists in Great Britain and Ireland, France, Germany, Austria, Italy, Russia, Canada, the United States, South America, India, Australasia, South Africa, etc., and is therefore specially adapted for all Advertisements to the Drug Trade at home and abroad. The average number of copies printed weekly is 7,000.

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Germany.....	Mks. 11	Belgium.....	Fr. 13.25
Austria & Hungary..	Fl. 6.20	Italy.....	L. 14.00
Norway & Sweden ..	Kr. 9.60	Greece.....	Dr. 15.00
Denmark.....	Kr. 9.60	Spain.....	Pes. 14.00
Russia.....	Rbls. 3.70	Portugal.....	Reis. 2.865

Advertisements and Subscriptions should be addressed to the Publishers, 5, Serle Street, Lincoln's Inn London, W.C. Postal Orders should be made payable at Lincoln's Inn, W.C., to STREET BROTHERS. Cheques should be crossed "London Joint Stock Bank."

CARRIAGE RIDING AS "EXERCISE"; THE "OMNIBUS CURE."—Purville contradicts the received impression that riding in a vehicle is not beneficial exercise. He quotes a case which recovered by this treatment. The worse the construction of the vehicle the better for the patient; a country waggon is excellent for many cases. Doubtless walking is preferable, but where this is impossible, carriage or omnibus riding is a good substitute. *Rev. Int. Med. et Chir.*

FISH AND ARTIFICIAL MUSK.—A chemical works on the banks of the Rhone, in the canton of Geneva, is devoted to the manufacture of artificial musk, and it is found that the fishes, more especially the trout, in the river, which are caught in the neighbourhood, have a musky savour. Anglers know that the essential oils of anise and lavender attract fishes, foxes, and other animals. Has musk a similar effect, and do the fishes in this case eat the musky residues which are thrown into the river or become tainted with them through the water?—*Globe.*

Partnerships Dissolved.

[From the *London Gazette*.]

Jas. Martin and Samuel Berghem, carrying on business as manufacturers of pharmaceutical preparations under the style of G. and C. Stern at 62, Gray's Inn Road, W.C. The business will be carried on by S. Berghem.

* * * * *

Dan Haigh and James Howard, carrying on business as mineral water manufacturers at Mossley, Yorks, under the style of Haigh and Howard. The business will be carried on by Jas. Howard.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

BOOK FOR MARRIED WOMEN. By T. R. ALLINSON. Post 8vo, pp. 64. Price 1s. (F. Pitman.)

PRACTICAL HYDRAULICS. By T. BOX. Eleventh edition, post 8vo, pp. 86. Price 5s. (Spon.)

THE ELEMENTS OF BOTANY. By F. DARWIN. With illustrations. Post 8vo., pp. 246. Price 6s. (*Cambridge Natural Science Manuals*.) (Camb. Warehouse.)

A MANUAL OF HUMAN PHYSIOLOGY. By J. H. RAYMOND. Prepared with special reference to Students of Medicine. With 102 illustrations in text and four full-page coloured plates. Post 8vo., pp. 360. Price 6s. net. (Kimpton.)

AN INTRODUCTION TO PATHOLOGY AND MORBID ANATOMY. By T. H. GREEN. Eighth edition. Revised and enlarged by H. Montague Murray. Illustrated by 224 engravings. 8vo, pp. 680. Price 17s. (*Renshaw's Manuals*.) (Renshaw.)

ELASTICITY A MODE OF MOTION, BEING A POPULAR DESCRIPTION OF A NEW AND IMPORTANT DISCOVERY IN SCIENCE. By ROBERT STEVENSON, C.E., M.E. 50 cents. (The San Francisco News Company, San Francisco, California.)

OFFICIAL YEAR BOOK OF THE SCIENTIFIC AND LEARNED SOCIETIES OF GREAT BRITAIN AND IRELAND. (G. Griffin and Co., London.)

THE THEORY OF PHYSICAL EDUCATION IN ELEMENTARY SCHOOLS. By THOMAS CHESTERTON. With a Preface, by G. M. Onslow. (Gale and Polden, Limited, London.)

THE KINDERGARTEN AT HOME. By EMILY A. E. SHIRREFF. Third Edition. (W. H. Allen and Co., Limited, London.)

HISTORY OF MONETARY SYSTEMS. By ALEXANDER DEL MAR, M.E. (Erfingham Wilson, London.)

STUDIES IN AMERICAN EDUCATION. By A. B. HART. Cr. 8vo, pp. 150. Price 5s. (Longmans, Green and Co., London.)

LESSONS IN ELEMENTARY PHYSICS. By B. STEWART. New and enlarged edition, 12mo. Price 4s. 6d. (Macmillan and Co., London.)

Late Advertisements.

To be Let.

DENTISTS and Medical Men.—First floor to be Let above chemists. Best position in neighbourhood. Splendid opening. FIDUS, care of Mr. Davidson, 6, Clarence Rd., Lower Clapton, N.E.

Business for Disposal.

£850.—London, S.E. Main road. Improving neighbourhood. Returns £1050. Light RETAIL with good specialities. This is a good opportunity for anyone wishing to buy a genuine business, as proprietor can give ample reasons for leaving. Apply, H. S., Office of "Pharm. Journal," 5, Serle St., W.C.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, MAY 25.

School of Pharmacy Students' Association.

Botanical Excursion to Kew. Train from Euston at 2.15 p.m. (change at Willesden for Kew Bridge)

Pharmaceutical Cricket Club v. Crown Cricket Club (Ealing. Train leaves Westbourne Park at 2.35.

MONDAY, MAY 27.

Society of Arts (Cantor Lectures), at 8 p.m.

"Japanese Art Industries" (Second Lecture), by Ernest Hart.

TUESDAY, MAY 28.

Royal Institution of Great Britain, at 8 p.m.

"Thirty years' Progress in Biological Science" (Third Lecture), by Professor E. Ray Lankester.

Royal Photographic Society, at 8 p.m.

"Polychromatic Carbon Printing" with a Demonstration, by Birt Acres.

Society of Arts (Applied Art Section), at 8 p.m.

"The Decoration of St. Paul's," by Professor W. L. Richmond.

WEDNESDAY, MAY 29.

University College (London) Chemical and Physical Society, at 5 p.m.

Ordinary Meeting.

Midland Pharmaceutical Association.

Annual Meeting at the Mason College at 7.30 p.m.
Annual Supper at the Grand Hotel at 9 p.m.

THURSDAY, MAY 30.

Royal Institution of Great Britain, at 3 p.m.

"The Instruments and Methods of Spectroscopic Astronomy" (Second lecture), by Dr. W. Huggins

School of Pharmacy Students' Association, at 7 p.m.

"Commercial Tincture and Extract of Cinchona," by Harold Brown.

"Report on Organic Chemistry," by C. S. Ellis.

FRIDAY, MAY 31.

Royal Institution of Great Britain, at 9 p.m.

"The Radiant Heat from the Moon during the Progress of an Eclipse," by the Earl of Rose.

SATURDAY, JUNE 1.

Royal Institution of Great Britain, at 3 p.m.

"Elizabethan Literature: The Pastoral," by Mr. E. Dowden.

Geologists' Association (London).

Excursion to Banbury. Train leaves Paddington (G.W.R.) at 12.25 p.m.

MICROBES AND MAN.—It has really seemed, over and over again, as if man were on the verge of understanding the nature of diseases, and of being able to prevent them. To see how far we still are from this alarming subversion of nature, there is a story being told of a well-known practitioner who actually attempted to carry it out in the case of his child. Railway carriages, park seats, contact with strangers, uncertain food and clothing, all the usual sources of infant disease were carefully avoided by the over-anxious parent, the condition of life being almost antiseptic. And now the poor little thing, with a mass of materials for ordinary microbe consumption left unused in its system, is seized with a totally new and inexplicable disease of its own. Truly nature is not to be trifled with, and will not be mocked!—*Pall Mall Gazette*.

Pharmaceutical Journal

SUPPLEMENT

LONDON, JUNE 1, 1895.

Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

Weekly Record of Pharmacy and Allied Sciences.

The oldest Journal addressing Pharmacists.

Published in the United Kingdom, France, Germany, Austria, Italy, Russia, Switzerland, Canada, the United States, South America, India, Australasia, South Africa, etc.

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ANNUAL SUBSCRIPTION, INCLUDING POSTAGE, 10s. 6d.

In addition to being the sole periodical publishing full and complete reports of the transactions of the Pharmaceutical Society and of the British Pharmaceutical Conference, the JOURNAL records the proceedings of pharmaceutical and other scientific societies throughout the country, and chronicles all important advances in pharmacy and allied subjects in this country and abroad. Views of new scientific and technical works form an important feature in the JOURNAL, and its pages are also given for the discussion of matters of importance to British pharmacists generally, as well as for the purpose of supplying special information desired by subscribers.

The JOURNAL is supplied from the Publishing Office, Serle St., Lincoln's Inn, W.C., post free for twelve months to any address throughout the world, on receipt of remittance for Ten Shillings and Sixpence.

NEW SERIES OF THE JOURNAL.

The next special issue of the PHARMACEUTICAL JOURNAL will be the number for July 6, which will commence a new series—the fourth. The pages will be enlarged, and new paper and type will be employed.

Copies of this issue will be distributed to Chemists, Hospitals, Wholesale Houses, and Dispensers throughout

GREAT BRITAIN AND IRELAND,

also in the following countries abroad:—

Australia	India
New Zealand	Ceylon
Tasmania	South Africa
China	West Indies
Japan	Canada
Straits Settlements	United States, etc.

total guaranteed circulation will exceed

16,000 copies.

Advertisements should be sent without delay to the PUBLISHERS, 5, Serle Street, Lincoln's Inn, London, W.C.

Photography for Chemists.

The next special article on this subject will appear in next week's Supplement, and will treat of the construction and arrangement of a convenient dark-room for chemists, the text being illustrated by drawings. Photographic queries or requests for special information, received sufficiently early in the week, will be as far as possible dealt with in the same number.

Late News.

MIDLAND PHARMACEUTICAL ASSOCIATION.

The annual meeting of the Midland Pharmaceutical Association was held on Wednesday evening at Mason Science College, Birmingham, Mr. R. Darton Gibbs (President) in the chair. Amongst those present were Messrs. W. Jones, A. Southall, F. H. Alcock, F.I.C., J. Barclay, B.Sc.; G. E. Perry (hon. sec.); C. Thompson, F. H. Prosser, F. T. Gibson (Leamington), etc.

ANNUAL REPORT.

In the annual report the Council pointed out that the number of members is 172. The chief matter brought under the notice of the Council during the year had been the inauguration of classes in chemistry at the Midland Institute for pharmaceutical students. The classes had met with the support of a goodly number of students, who had expressed themselves as well satisfied with the work so far accomplished. Questions of trade interest had been under consideration by the Council, and more particularly the vexed one of company trading. There had been no calls made upon the benevolent fund during the year. The books added to the library were the 'Year-Book of Pharmacy,' from the Conference authorities, the *Pharmaceutical Journal* and the 'Calendar of the Pharmaceutical Society,' from the Pharmaceutical Society, and the 'Hand-book of Bacteriology' from the authors (Drs. Kanthack and Drysdale). In conclusion, the Council expressed the hope that in future sessions a larger number of members might be found to actively participate in the work of the Association. The financial statement showed that there was a favourable balance of £14 18s. 9d.

The Chairman moved the adoption of the report, and in doing so said that probably matters had been too quiet during the year for the well-being of the Association. The papers that had been read were of exceptional interest to pharmacists, and therefore it was exceedingly regrettable that the attendances had been so small. The social side of the Association had been very successful, and he hoped the attention he had drawn to the fact would stimulate members to greater enthusiasm on the scientific side. With reference to the pharmaceutical classes, he had, on behalf of the Association, expressed to Mr. Woodward approval of them from an educational standpoint, but if they were merely intended as coaching

lasses or cramming classes for crowding young men through the pharmaceutical examinations they were distinctly opposed to them. He hoped that when they considered that their doings were watched by those outside their Association they would awaken to greater enthusiasm and do all they could to maintain the value of their Association.

Mr. W. Jones seconded the motion, and said that he fully agreed with many of the things the President had said, and congratulated the Association on its financial position.

Mr. A. Southall in supporting the motion, regretted that the lectures had not been better attended.

Mr. C. Thompson and Mr. F. H. Alcock also supported the motion, which was carried.

In the election of the new Council the retiring members of the Council were re-elected.

On the motion of Mr. C. Thompson, seconded by Mr. J. Barclay, a vote of thanks was passed to the President and the Honorary Secretary, who briefly replied.

THE ANNUAL SUPPER.

The annual supper was afterwards held at the Grand Hotel, under the presidency of Mr. R. Darton Gibbs, when there was a fair assemblage of members.

After the loyal toast had been honoured, Mr. F. T. Gibson proposed "The Pharmaceutical Society," and coupled with it the names of Mr. A. Southall and Mr. C. Thompson.

Mr. Southall, in reply, said that since he had been a member of the Council he had been very much pleased with the working of the Society. It did not do as much as it might perhaps, but it did more than many outsiders imagined. Since he had been on the Council he had seen a good deal more of the working of the Society than he previously had, and he could say that it had done a great deal in the way of prosecutions. They could not publish all they did, because it would be libellous, but they had done much in the way of disturbing the grocer in the sale of patent medicines, and what they wanted was more combination amongst chemists to prevent the sale of patent medicines containing poisons by unregistered persons.

Mr. Thompson also bore testimony to the excellent work the Society had done.

Councillor Barrett (Leamington), proposed "The Midland Pharmaceutical Association," and said that the Pharmaceutical Society and the Midland Pharmaceutical Association were not doing the work they demanded of them. They were told it was their own fault. He did not deny that the Midland Pharmaceutical Association had done good work, but it did not do the whole work they demanded from it. He counselled them to approach all their parliamentary representatives for the purpose of getting that protection for their craft to which they were justly entitled.

Mr. Smith (Leamington) supported the toast, and urged the members to obtain from all the parliamentary candidates a pledge as to whether they would or would not support an amendment of the law affecting chemists.

The President, in reply, said that if the Association had failed it was not due to the members of the Council, who had devoted many hours to the consideration of subjects associated with their craft, and endeavoured to devise remedies for the evils that were said to exist. If there was a lot of evils existing, someone outside the Council would have come forward and said so, but, instead, not a single member of that Association had come forward during

the year to raise a finger against the Council or complain of its work.

Mr. Perry also replied.

FEDERATION OF LOCAL PHARMACEUTICAL ASSOCIATIONS.

The following letter is now being issued to Presidents of Local Associations and others:—

May 30th, 1906.

Dear Sir,—We have pleasure in sending you herewith copies of Rules, which will be proposed for adoption at the 2nd Annual Meeting of the Federation to be held at Bournemouth in July next.

Will you kindly bring them before your Association for discussion with a view of appointing a delegate or delegates?

A reply at an early date will oblige,

Yours faithfully,

Members of the Executive Committee.

H. KEMP, President (Manchester Pharmaceutical Association).

W. L. CURRIE, Vice-President (Glasgow and West Scotland Pharmaceutical Association).

CHAS. SYMES, Ph.D. (Liverpool Chemists' Association).

CHAS. A. BOLTON (Nottingham and North Cheshire Association).

CHAS. THOMPSON (Midland Pharmaceutical Association), Hon. Secretary, Sparkbrook, Birmingham.

RULES.

1.—That this Association shall be called "The Federation of Local Pharmaceutical Associations of Great Britain."

2.—That it shall consist of Representatives from properly constituted and subscribing local Pharmaceutical or Chemists' Associations in England, Scotland, Wales. That each Association shall have the right to appoint one delegate for every fifty members who paid their Annual Subscriptions for the current year.

3.—That the objects of the Federation are:—

(1) To establish more intimate communication co-operation between Chemists generally, and Associations in particular.

(2) To unite, advise, and assist in the promotion of local combinations.

4.—That the Executive Committee shall consist of President, Vice-President, Secretary and Treasurer, three others appointed at the Annual Meeting, to form a quorum.

5.—That every Local Association shall pay an Annual Subscription of 10s. for each delegate appointed, payable on the 1st of January in each year.

6.—That the delegates shall pay their own expenses when attending the meetings of the Federation, except cases when special journeys have to be made, or special services have been rendered, when a grant may be made by the Executive Committee.

7.—That the Annual Meetings, subject to the approval of the Executive Committee, be held in the same place and during the same week as the Annual Meeting of the British Pharmaceutical Conference.

8.—Chemists residing in districts in which there is no established Pharmaceutical Association may become subscribing Members of the Federation on payment of an Annual Subscription of 5s., and shall have the right to vote at the Annual Meeting, and shall be eligible to hold office the same as an accredited delegate.

9.—All delegates of Local Associations attending the meetings of the British Pharmaceutical Conference may attend the Annual Meeting, and, with the sanction of the chairman for the time being, take part in the discussion

it they shall not vote nor shall they be eligible for election to any office.

10.—These rules shall not be altered except at an annual Meeting.

HERBERT SPENCER ON THE MEDICAL ART.

In continuing, in the pages of the *Contemporary Review*, his studies of professional institutions, and in comparing their evolution with evolution at large, Mr. Herbert Spencer deals this month with the physician and surgeon. In primitive societies, he points out, the functions of the medical man and the priest are combined. This arises from the fact that primitive people are very apt to believe that diseases, when not caused by angry gods, are the work of indwelling demons, who love either to be driven out by making the body an intolerable residence, or expelled by superior spirits who are invoked. While the medicine man is distinctive of small and undeveloped societies, the priest proper arises along with social aggregation and the formation of established government. This continuity of belief and usage, he declares, is even still shown in the surviving interpretations of certain diseases by the church and its adherents, and it is still traceable in certain modes of medical treatment and certain popular convictions connected with them. The notion that disease is caused by a demon that must be driven out continued, Mr. Herbert Spencer says, until recent times to give a character to medical practice, and nowadays still influences the conceptions which many people form of medicines. The primitive medicine man, hinking to make the body an intolerable habitat for the demon, exposed his patient to this or that kind of alarming, painful, or disgusting treatment. He made before him dreadful noises and fearful grimaces, or subjected him to an almost unbearable heat, or produced under his nose atrocious stenches, or made him swallow the most loathsome substances he could think of. Not only during mediæval days, but in far more recent days, the efficacy of medicines was associated in thought with their disgustingness; the more repulsive they were the more effectual. Having traced the separation of medical from ecclesiastical functions, a process he calls primary differentiation, Mr. Spencer follows the course of further subdivisions or secondary differentiations, as in the separation of physicians from surgeons and the formation of associations designed to keep unqualified persons out of the exercise of the healing art.—*Daily News*.

A PALATABLE PRESCRIPTION.

The invitations to the sixteenth annual session of the Kansas Pharmaceutical Association, held at Leavenworth, Kas., May 21-23, 1895, were sent out in a distinctly novel style, being in the form of a prescription, thus:—

For K. P. A. Members and Friends.

First Session..... 10 o'clock a.m.
Address of Welcome—R. J. Brown's
President's Address—H. H. Hettinger's, aa....15 min.
Fort Leavenworth and Military Drill 2 hrs.
Informal Reception—Chickering's..... 4 hrs.
Games, Boating, Contests, and Prizes.....1-2d.
Old and New Officers..... aa 8
Opera House Entertainment 2 hr.
Papers, Discussions, and Railroad Certificates g.s. 3d.

f. Sig. Take three hours, in Leavenworth, three times a day for three days. Repeat in one year.

A printed note accompanying the above, issued by the Sunflower Pharmacal Association, Leavenworth, runs as follows:—"If you are in doubt about this prescription bring it and \$1.00 to Leavenworth. The Sunflower Pharmacists there assembled will help you out of the difficulty. If you take this according to directions your relief from ennui will be immediate and your cure permanent."

BRITISH ASTRONOMICAL SOCIETY.

A meeting of the British Astronomical Society was held in the Mathematical Theatre of University College, Gower Street, on May 29. Mr. E. W. Maunder (President) in the chair. A communication from Mr. Ledger was read by Miss Everett, one of the Secretaries, making various suggestions with reference to the Solar Eclipse Expedition of 1896. The writer observed that those members who wished for only a spectacular view of the eclipse could do so very well from Bodo, on the west coast of Norway, but it would not be worth their while to take heavy telescopes, or to set up instruments there, as the sun would be very low and bad for telescopic observation. Those who desired to make scientific observations would be well advised in selecting the Waranger Fjord on the east coast. The President remarked that the east coast expedition was the one of real value for scientific observation, that proposed for the west coast being of minor importance compared with it.—Mr. E. Holmes read a paper on the reproduction of astronomical drawings, in which he insisted on the great care which should be exercised in avoiding those finishing touches which are likely to destroy the truth of the original.—A paper was also read by Professor Turner on simple apparatus for measuring stellar photographs.—Afterwards a general meeting of the members was held, at which certain alterations of the Rules of the Society were considered.—*Standard*.

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Austria & Hungary..	Fl. 6.20	Italy.....	L. 14.00
Norway & Sweden ..	Kr. 9.60	Greece.....	Dr. 15.00
Denmark.....	Kr. 9.60	Spain.....	Pes. 14.00
Russia.....	Rbls. 8.70	Portugal.....	Reis. 3.365

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MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, MAY 30, 1896.

Changes in the Chemical Market may be briefly summed up as follows:—Carbolic acid is easier and lower prices have been paid. Both tartaric acid and cream of tartar are hardly so firm as last week, whilst a considerable fall has occurred in sulphate of ammonia. With regard to potash salts, chlorate has again been a very firm market. The importers of quicksilver have again advanced their prices. Full details will be found below:—

ACID CARBOLIC.—The market is generally easier, owing to the purchases for foreign contracts having been completed. The current quotations are now as follows:—Crystals:—34° to 35° C., 5½d. per lb.; 39° to 40° C., 6¼d. per lb.; 39° to 40° (detached crystals), 7¼d. per lb. These quotations are for acid in 2 cwt. drums. Crude 60 per cent. is 1d. lower at 1s. 7d., with 75 per cent. at 1s. 10d. Cresylic (Liquid Carbolic Acid) is steady at 1s. 1d. per gallon, for 95 per cent.

ACID, CITRIC.—Very firm, at unaltered rates, but there is not much business doing. It is quoted at 1s. 1½d. to 1s. 2d., according to quantity.

ACID, OXALIC.—The price quoted by manufacturers is unaltered, and a considerable amount of business has resulted at the rate of 3½d. net. ex. rails.

ACID, TARTARIC.—The quotations are unchanged, although the market is if anything a shade weaker. English manufacturers still quote at 11d. to 11¼d., whilst foreign brands of acid, both in powder and crystals are worth 11d.

AMMONIA SALTS.—Carbonate: Unchanged at 3½d. to 3½d. Liquor: Fairly steady at 3d. to 3½d. Sal ammoniac: The quotation for first quality is maintained at 3½s., with seconds at 3½s. Sulphate has been on the down line throughout the week, but at the close the quotation of £9 15s. shows a fall of 6s. only on last week's rate, for grey 24 per cent.

ASHES.—In steady demand at unaltered rates, American being quoted at 40s., with Pots at 33s.

ARSENIC.—Very firm, owing to the scarcity of supplies, and good white powder cannot be bought under 15s. 3d. to 15s. 6d. Higher prices are probable.

BLEACHING POWDER.—Continues in good demand at steady rates. In London the price is £7 to £7 15s., whilst in Liverpool the quoted rates are still £7 10s. to £7 15s. f.o.b.

BORAX.—Unchanged, but in moderate demand. Convention prices are still 20s. for crystals with powdered at 21s., but in second hands it is offered at lower rates.

COAL-DISTILLATION PRODUCTS.—Benzole 50 per cent. is 1d. down, and the quoted rate is 11d. per gallon, 90 per cent. is unchanged at 1s. per gallon. Pitch is firmer at 87s. 6d. per ton f.o.b., whilst Tar is a trifle dearer at 11s. 6d. per barrel of 40 gallons.

COPPER SULPHATE.—Very steady, and a fair amount of business has been done at the unaltered rates of £15 to £15 10s. according to brand.

CREAM OF TARTAR.—Hardly so firm, and lower prices have been in some cases accepted. At the close, however, German makers are again quoting powder at 72s. on the spot, whilst fine white French crystals are worth 70s.

MERCURIALS.—The quotations are at present unchanged at the undermentioned rates, but owing to the advance in quicksilver, a corresponding all-round rise in mercurials is probable. For quantities up to 56 lbs. the prices are:—Calomel, 2s. 4d.; Corrosive Sublimate, 2s. 7d.; red precipitate, 3s. 2d.; ditto (levigated), 3s. 2d.; white precipitate, 3s. 2d.; persulphate, 2s. 3d.; sulphur with sulphur, 2s. 2d.; mercury with chalk, 1s.

POTASH SALTS.—Bichromate: Steady at 4½d. to 4½d. Chlorate: A very brisk market, and a large amount of business has been done at advanced prices both in London and Liverpool, the closing quotation in both centres being 5d. per lb. Permanganate: Small crystals still offered at 52s. 6d. to 53s. Prussiate: Quiet at 8½d to 8½d.

QUICKSILVER.—On the 27th inst. importers advanced the price 5s. per bottle, the official rate being now £7 14s. In second hands it can, however, be bought at £7 8s.

SALTPETRE.—British refined is worth 22s. 6d. to 22s. 6d. on the spot. In Liverpool it is quoted at 23s. 6d. in bags, and 23s. in barrels.

SODA COMPOUNDS.—Unaltered. Bicarbonate, £7 5s. in London, whilst in Liverpool it is quoted at £6 15s. Caustic soda, 70 per cent., £8, with £7 paid for 60 per cent. Crystals, 38s. Hyposulphite, £6 5s. in 1-cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, MAY 30, 1896.

There was more animation at the drug sales to-day, and the tone of business generally was somewhat improved. A considerable amount of crude camphor, both China and Japan, sold at high prices, and the large amount of wax offered generally met with a good demand. Full details of the various articles of interest are given below:—

ACACIA.—Twenty-six bales only were offered to-day. These were all Turkey sorts, and were bought in at 55s. to 57s. 6d. for hard glassy, mixed gum, part amber.

ALOES.—East Indian was in but moderate supply, and was all bought in at the auctions. For fair to good brown soft Socotrine, of good aroma, 65s. to 70s. is asked. A parcel of 80 cases of Cape met with a good demand at fair prices, 25s. being paid for good bright hard, 23s. 6d. for fair seconds, and 19s. for dull drossy quality. Zanzibar met with no enquiry, 21 cases in skins being bought in at 61s. for medium, part softish, of fair colour, and 40s. for dross grades.

AMBERGRIS.—Four tins only were offered. These were all bought in. Good yellow lump being held for 32s. with greyish lump of fair flavour for 70s.

AMMONIACUM.—Very firm: 18 packages only were offered; of these 3 cases of part blocky gum, very slight seedy sold at 33s.; 1 case of good small grain sold at 32s. The remainder was bought in at 30s. to 32s. 6d. for very seedy, partly blocky gum.

ANISEED.—A single bale of fair quality Spanish from Gibraltar sold at 30s. The remainder was bought at 30s.

ANNATTO SEEDS.—No enquiries. Good bright Madras seed was bought in at 4½d.

ARECA NUTS.—A parcel of 20 bags of Colombo nut were bought in to-day at 12s. 6d.

ASAFOETIDA.—Only 51 cases were offered to-day, and met with no enquiries. Dark almondy block was bought in at 40s. to 50s., and soft greyish block, part almondy 30s. to 35s.

BENZIN.—The supplies offered to-day were only medium. Of Siamese gum three cases of fine bold, clear blocky of good colour sold without reserve at £13 10s. to £14 2s. 6d. Sumatra gum was mostly bought in at the rate of £7 5s. to £7 10s. for fair to good seconds, with pale almondy centres, and £6 10s. to £6 15s. for medium ditto, but two cases bold, pale almondy seconds sold at £8 10s., and one ditto of medium seconds sold at £6 7s. 6d. Palembang gum was all bought in.

BIRDLINE.—A parcel of 11 cases of Japan was bought in at 1s. 3d., a bid of 9d. being refused.

BUCHU.—41 bales only were offered of these, fair round leaves of medium colour, partly stalky, sold at 2½d., and for another parcel a bid of 2½d. was also submitted. Of the long variety, four bales of ordinary quality sold at 4d.

CAFFEINE.—Remains quiet at somewhat easier rates. For small parcels in second hands, 25s. has been paid during the week. For delivery, August to September, the makers are now quoting 18s.

CASCARA SAGRADA.—A parcel of 70 bales of brook bark, good quality was bought in to-day at 18s., a bid of 16s. 6d. being refused.

CASCABILLA.—Lower, 10 bales of rather small silver bark, good quality, sold at 37s. 6d.

CASSIA FISTULA.—Thirty-two bags of good bold pods were bought in at 23s., after a bid of 15s.

CINCHONA.—At the bark sales on the 28th ult., only 1940 packages were offered against 3114 at the preceding auctions. The majority offered consisted of *East Indian* bark, which sold at fairly steady rates, the average limit being 3½d. per lb. *South American*: Cultivated *Calisaya* quills sold at 6½d. for fine sound, down to 3½d. for good ditto, country damaged, 3½d. to 6½d. Stout quill *Succirubra* sold at 6½d., with thin damaged do. at 2½. *African*: Broken quill sold at 1½d. to 2½d., fair sound ditto, 2½d. to 2½d. *Java*: Good *Ledger* chips sold at 3½d.; small, 2½d.; branch, 1½d.

CALUMBA.—Moderate supply only. Good yellow washed sorts were bought in at 25s., the limit being 23s. Twelve bags of ordinary small root sold at 9s.

CAMPOR.—The market is very strong at steadily advancing prices. At the close *China* has been selling for arrival May to July steamer at 160s., c.i.f. Holders of *Japan* are asking 170s. c.i.f., also May to July steamer. A considerable amount was offered at the drug sales to-day, and was all sold, 155s. being paid for *China*, and 160s. for *Japan*.

CAMPOR (Refined).—The refiners' prices are unaltered, the current quotations for 10 cwt. lots being 1s. 9½d. for *bells and flowers*, with *squares* at 1s. 10½d., and proportionate rates. At the sales to-day 28 cases refined *Japanese* were bought in at 1s. 8d. to 1s. 9d., and one tin being sold at 1s. 7d. Two casks *German* were bought in at 1s. 10d., another parcel being sold at 1s. 7d.

CANNABIS INDICA.—Sixty-one packages were offered, of these a parcel of rather stalky seedy tops were bought in at 3½d., and 20 bales of very stalky brown tops were sold at 1d.

CANTHARIDES.—Five casks of *Russian* flies were bought in at 8s., whilst *Chinese* was also withdrawn at 1s. to 1s. 2d. for somewhat dusty flies.

CARDAMOMS.—In moderate supply only to-day. The prices were as follows:—*Ceylon-Mysore*: Medium to good pale, 2s. to 2s. 4d.; small to medium pale, 1s. 5d. to 1s. 11d.; small to medium yellow, 1s. 3d. to 1s. 5d.; damaged by water and smoke, 1s. 6d. down to 10d., according to size and condition. *Seed* was lower, and sold at 1s. 6d. to 1s. 10d.

CODEINE.—Quotations remain unchanged at 10s. 3d. to 10s. 9d., according to quantity and brand.

COLOCYNTH.—*Turkey*: Seven cases only were offered to-day. These were broken *Spanish* apple, and were bought in at 1s. to 1s. 2d. Good qualities are scarce, *Turkey* being worth 2s.

COPAIBA.—Good pale *Maranhão* sold at 1s. 9d. to-day.

CORIANDER SEED.—*Calcutta* seed was in plentiful supply, and was all bought in at 9s. to 9s. 6d.

CUBEBS.—Still quite neglected. Fair to good brown *Singapore* and *Bombay* berries were bought in at 45s. to 55s.

CUMIN SEED.—*Mogador* seed was all bought in, the limit being 23s.

DRAGON'S BLOOD.—Only the *lump* gum was offered to-day, and the best qualities were all bought in. Two cases fair damp, drossy block sold without reserve at £5 5s., and two cases of fair seedy lump at £6 17s. 6d. Fine bright fiery gum was bought in at £11; ditto, part seedy, £10 10s. down to £6 10s. for dark saucers.

COCAINE.—On the 29th ult., the manufacturers again lowered their quotations, on this occasion 1s. 6d. per oz., and the current rates are now as follows:—For 100 ozs., 16s.; from 25 to 100 ozs., 16s. 3d.; and for lots under 25 ozs., 16s. 6d. These quotations are for *Cocaine* in tins, 1-oz. bottles being charged 3d. per oz. more.

COCA LEAVES.—Seventeen bales broken *Truzillo* leaves of good colour were bought in at 1s., the limit being 11d.

ELEMI GUM.—Firm. A parcel of 35 cases of fairly clean pale gum sold freely at 25s. to 28s.

ERGOT OF RYE.—Five bags new *Spanish* ergot sold to-day at 8d.

FENNEL SEED.—Twenty bags sold at 21s. subject.

GALBANUM.—Dusty gum, partly blocky and seedy, was bought in at 1s. 3d., a bid of 1s. being refused.

GAMBOGE.—Ten cases of good pipe of fair fracture sold at £9 to £9 5s. The remainder was bought in at the rates of £10 10s. for mixed pipe of good colour and fracture down to £7 for dark drossy mixed block.

GRASSTREE GUM.—All bought in at 7s. 6d. to 9s. 6d. according to quality.

GUAIACUM.—A parcel of 30 cases met with good demand, all being sold at rates ranging from 2s. 8d. for good bright gum, clean fracture, and 1s. down to 4d. ordinary to low drossy block.

HONEY.—In good demand. *Jamaica* especially sold well at 19s. up to 27s.; and 13s. 6d. to 19s. for inferior qualities. Five kegs fine white *Frisco* honey sold at 28s. All the *Australian* was bought in.

IPERCACUANHA.—Privately a large amount of business has been done in *Carthagenia* (*Columbia*) root at 3s. 5d. per lb., and it is very scarce, no fresh arrivals having come to hand. For small quantities, 3s. 6d. is the price. To-day, *Rio* root sold somewhat freely. Ordinary wire to good sound root fetched 3s. 9d. to 4s. 6d. per lb., and thin damaged to fine bold picked realised 3s. 9d. to 4s. 9d.

JABORANDI.—Twenty-three bales were offered, but none sold. For a parcel of ordinary leaves, a bid of 8d. was submitted. The other lots were bought in at 8d. to 1s.

KOLA.—Very steady. Bold brown *West Indian* nuts sold at 1s. 10d., fair brown, 1s. 7d. The remainder was bought in at 1s. 8d. to 2s., according to quality.

LIME JUICE.—Seventeen packages of fair *Jamaica* juice was bought in at 1s. 2d. to 1s. 4d.

LIQUORICE ROOT.—Ordinary unpeeled root was bought in at 8s.

MASTIC.—Eighteen cases good bright drop were bought in at 2s.

MENTHOL.—Remains very dull of sale at easy rates. Holders offer dry white crystals at 14s. 9d. to 15s. on the spot whilst for delivery it is still quoted at 13s. 6d. to 14s. c.i.f. terms. To-day 4 cases sold without reserve at 12s. 9d. to 13s.

MORPHINE.—Is unchanged at 4s. 3d. for 1000 oz. lots, and 4s. 5d. for smaller wholesale quantities. *Crystals* 2d. per oz. more.

MYRRH.—Absolutely no enquiries. The only lot sold consisted of 2 bales of dark chips, which fetched 20s. Good native picked gum was bought in at £6 10s.; fair ditto, 35s. to 90s.; ordinary ditto, 60s. to 75s.; good siftings, 42s. 6d. to 52s. 6d.; pickings, from 20s. to 30s.

NUX VOMICA.—No inquiries. Fair *Colombo* seed was bought in at 6s.

OILS (ESSENTIAL).—*Star Anise*: Remains quiet but firm at unchanged rates. The spot price is 6s. 4d. to 6s. 5d., whilst for shipment May to June it is quoted at 6s. 5d., c.i.f. terms. *Cajeput*: The present price is 2s. 9d. to 3s. per bottle. *Cassia* quiet; on the spot 4s. 10½d. to 5s. is still asked for oil containing 75 to 80 per cent. of aldehyde, and for shipment it is quoted at 4s. 9d. c.i.f. terms. *Cinnamon*: Six cases sold without reserve at 5½d. to 7d. *Citronella*: Very firm, and a fair amount of business has been done at 1s. 3d., holders now asking 1s. 4d. For arrival it is quoted at 11½d. c.i.f. in tins. *Eucalyptus*: Bought in at 1s. 3d. to 2s. 6d., and the *Black Swan* brand at 10d. *Lemon Grass*: Dull of sale and nominally 1½d. *Peppermint*, *H. G. Hotchkiss* oil, is firmer at 9s. 9d. to 10s. *Japanese* oil containing 40 per cent. menthol is unchanged at 7s. 6d. *Cocking's* oil was bought in at 6s. 6d., with ordinary *Japan* oil at 6s. *Dementholised* oil is worth 5s. 9d. to 6d. *Rose*: Bought in at 4½d.

OILS (FIXED) AND SPIRITS.—*Cotton*: Quiet but steady. £18 to 18 10s. is the current quotation for refined oil, according to brand and package. *Coco-nut*: Dull of sale. *Ceylan* is quoted at £22 10s. to £22 15 on the spot. *Cochin* at £24 10s., and *Mauritius* at £22 10s. to £22 15s. *Linseed* dearer. On the spot in barrels it is now worth £21. *Rape* higher; refined oil on the spot is quoted at £23. *Turpentine* dearer; *American* spirit on the spot is now worth 22s. 7½d. to 22s. 9d. *Petroleum* lower; *American* oil is now quoted at 5½d. to 6d.; *Water white* at 7½d., and *Russian*, 5½d. to 5½d.

OIL (COD LIVER).—Continues in very brisk demand, fairly steady rates have been paid for *Norwegian* oil; the current price being 170s.

OPIMUM.—*Persian* opium continues a very firm market at leading prices. During the week 12s. has been paid for first quality, with seconds, at 10s. 6d. *Turkey* opium is flat. Soft shipping descriptions are quoted at 11s. 3d. to 11s. 6d.; best druggists', 9s. 6d. to 10s.; seconds ditto 8s. to 9s.

ORANGE PEEL.—All bought in at the rate of 10d. for fine out *Maltese* peel of good aroma down to 5d. and 6d. for ordinary dark coarse cut ditto.

ORRIS ROOT.—*Florentine* root was bought in at 90s., and ordinary at 72s. 6d.

PERU BALSAM.—Five cases of ordinary balsam were bought in at 9s.

PILOCARPINE.—Unchanged. Manufacturers quote at 7s. 9d. to 8s. per gramme, but it can be bought in second hand for decidedly less.

SENEGA ROOT.—Eleven bales good quality root sold to-day at 1s. 3d., which shows a fall of 2d. per lb.

SENNA.—*Tinnivelly* leaves were in fair demand. Fair medium green leaves sold at 3½d., small to medium yellowish 3d. to 2½d., down to 1½d. for ordinary. *Alexandrian* leaves were mostly bought in, but a few bales sold at 2d. to 3d. *Pods* were all bought in.

SHELLAC.—The market has been somewhat quiet, but prices are very firm, and privately sales have been made at higher rates, and of ordinary *T.N. Orange* at 126s. to 130s. At the sales on the 28th ult. about one-third of the amount catalogued was sold. Prices:—*Second Orange*: Fine, 132s. to 136s. *Second Orange T.N.*: 126s. to 128s. *Button*: Glassy, *BL 4*, 101s. up to fine pale glassy at 122s.

SQUILLS.—All bought in at 2d. to 3½d.

QUININE SULPHATE.—Earlier in the week was quiet, and for *B. & S.* and *Brunswick* 1s. 0½d. was accepted. The principal items have been a sale of 35,000 ozs. of *B. & S.* and *H. B.* at 1s. 0½d. on the spot, and following this 5000 ozs. of *B. & S.* and *H. B.* at 1s. 0½d., and at the latter rate there are further buyers for bulk quantities, but holders ask 1s. 0½d. The quotation for July delivery is 1s. 0½d. to 1s. 0¾d., and for September, 1s. 1d. for the best *German* makers.

RHUBARB.—Very quiet. Only 4 chests sold; these realised 10½d. for medium flat, high-dried *Canton* root.

SANTONIN.—The current quotations for 1 cwt. quantities is 5s. 5d. to 5s. 8d. net.

SARSAPARILLA.—Easier. *Jamaica* sold briskly at 1s. 2d. to 1s. 4d., *Lima Jamaica*, 10d. to 10½d., *Honduras*, 1s. 1d.

TAMARINDS.—Fifty-two packages *West Indian* sold at 1s., if it would pay charges.

THYME SEEDS.—were bought in at 11s. to 12s.

TONCA BEANS.—Two cases medium size beans sold at 1s. 5d. A parcel of 7 cases sold at 8d.

TURNERIC.—All bought in at 8s. up to 15s. for *Madras* root.

WAX (Bees).—In large supply, and met with a good demand. *Jamaica*: Sold at £8 5s. to £8 10s. *Madagascar*, sold at £6 15s. to £7 2s. 6d. *Australian*, £7 7s. 6d. to £7 10s. *Spanish*, £8.

WAX (Japan).—Twenty cases of good squares sold to-day at 25s.

Partnerships Dissolved.

[From the *London Gazette*.]

Abraham Colles and Arnold Lyndon, general medical practitioners, Wellington, Somerset. Debts will be received and paid by Arnold Lyndon.

John Lever and William Jones, carrying on business as manufacturing chemists under the style of Lever and Jones, at Middleton, Lancs. The business will be carried on by John Lever under the style of Lever Brothers.

William Joseph Wilson and Thomas Henry Coleman, carrying on business as chemists and druggists, at 20, A Temple Street, Birmingham, under the style of the Temple Drug Stores. Debts will be received and paid by T. H. Coleman.

William Milligan and James Hamilton, physicians and surgeons, Huddersfield.

Thomas Soars Johnson and Richard Theodore Wheeler, surgeons and general medical practitioners, Sturry, and Herne Bay, Kent.

Company Business.

ROUTLY'S INDIAN DRUG COMPANY, LIMITED.—Registered on May 20 by Prince and Plumbridge, 2, Fleet St., E.C. Capital, £20,000 in £1 shares. Objects: To manufacture and deal in a certain proprietary medicine known as Routly's Indian Liver Pills; as manufacturers of and dealers in patent medicines and proprietary articles generally. Registered office: 14, Castle Street, Oxford Street, W.

BRITISH HYGIENIC ASSOCIATION, LTD.—This company was registered by Messrs. Waterlow and Sons, Ltd., London Wall, E.C., on May 7, with a capital of £25,000 in fifty founders' shares of £100 each, and 2000 ordinary shares of £10 each, to manufacture, import, export, sell, and deal in proprietary articles, and pharmaceutical, medicinal, chemical and other preparations. The number of directors is not to be less than two nor more than five. The subscribers are to appoint the first; remuneration, £50 each per annum.

MILTON PRINTING INK AND CHEMICAL COMPANY, LIMITED.—Registered by Jordan and Sons, 120, Chancery Lane, W.C. Capital £2000 in £1 shares. Object, to enter into certain agreements for the acquisition of the business of ink, chemical and oil manufacturers as hitherto carried on by Jones Brothers and Co., at Milra, Staffordshire. The directors are to be elected by the signatories. Qualifications, £50.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including price.]

OBJECT LESSONS IN BOTANY, from Forest, Field, Wayside, and Garden. Book II., for Standards 3, 4, 5, being a Teacher's Aid to a Systematic Course of One Hundred Lessons for Boys and Girls. By E. SHELGOVE. Post 8vo, pp. 304. Price 3s. 6d. (Jarrold, London.)

THE DISEASES AND DEFORMITIES OF THE FETUS: An Attempt Towards a System of Ante-Natal Pathology. By J. W. BALLANTYNE. With plates. Vol. II.: Congenital Diseases of the Subcutaneous Tissues and Skin. 8vo, pp. 274. Price 10s. 6d. (Oliver and Boyd, Edinburgh.)

HISTORICAL REGISTER OF THE UNIVERSITY OF OXFORD, completed to the End of Trinity Term, 1886. Part I. Cr. 8vo, pp. 220. Price 2s. (Clarendon Press Series.) (Henry Frowde, London.)

THE DATA OF ETHICS. By H. SPENCER. Cheap edition 8vo, pp. 280. Price 3s. (Williams and Norgate, London.)

LABORATORY GUIDE FOR THE BACTERIOLOGIST. By L. FROTHINGHAM. Illustrated. Royal 8vo. Price 4s. net. (Hirschfeld Brothers, London.)

PRACTICAL AND SCIENTIFIC AGRICULTURE. By J. MUIR. Post 8vo, pp. 354. Price 4s. 6d. (Macmillan and Co., London.)

LABORATORY ANALYSIS OF WATER, MILK, AND BREAD. By G. BIDIE. Crown 8vo, pp. 30, sewed. Price 2s. net. (Hirschfeld Brothers, London.)

SURGICAL PATHOLOGY AND MORBID ANATOMY. By A. A. BOULBY. Third edition. Post 8vo, pp. 653. Price 10s. 6d. (J. and A. Churchill, London.)

INDURATIVE MEDIASTINO-PERICARDITIS. By T. HARRIS. Reprinted from the *Medical Chronicle*, 1894-95. Royal 8vo, pp. 68. Price 5s. (Smith and E., London.)

CALVERT'S PRACTICAL TREATISE ON DECIMAL ANTHEMETIC. Eighth edition, post 8vo, pp. 54. Price 16d. (Heywood, London.)

MEDICAL GYNECOLOGY: a Treatise on the Diseases of Women from the Standpoint of the Physician. By A. J. C. SKENE. With illustrations. 8vo, pp. 334. Price 21s. (Young J. Pentland, London.)

SYLLABUS OF GYNECOLOGY, based on the American Text-Book of Gynecology. B. J. W. LONG. Oblong 16mo, pp. 184. Price 4s. net. (Hirschfeld Bros., London.)

Trade Notes.

MESSRS. CHEERS AND HOPLY, of Northgate Street, Chester, have purchased the stock of Mr. Jas. D. Bowers, pharmaceutical chemist, together with all proprietary rights, recipe and prescription books, etc., connected with his business.

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MESSRS. BEECHINGS, LIMITED, of 174, Strand, W.C., submit specimens of their combined "fac-simile" invoice form and wrapper (patented), which should prove very convenient to tradesmen. The invoice is folded into a pocket behind the wrapper. The latter being attached to the invoice itself, there is but little risk of wrongly addressing an invoice, and at the same time it is easily detached by the recipient, the paper being perforated for the purpose.

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MESSRS. F. NEWBERRY AND SONS think the paragraph in last week's Supplement, referring to their annual catalogue, may be slightly misleading, since it was not stated that it is already indicated in the catalogue that certain articles (over 100) contain scheduled poisons. Attention had been drawn to that fact in the Journal some time ago, however. The full paragraph in the catalogue is as follows:—"As a medicine-catalogue may very properly define which articles are subject to legal restrictions upon their sale, we have marked '(P.)' against those goods which we know to have been labelled 'Poison.' Should we, in the future, find that Medicines are so labelled as to indicate whether any of their ingredients fall within part 1, or part 2 of the schedule to the Pharmacy Act of 1868, this additional information will be published as opportunity offers."

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THE BRITANNIA WORKS Co., of Ilford, has purchased the business and goodwill of Mr. Austin Edwards, and will in future issue the photographic films and process plates hitherto made by Mr. Edwards, whose other productions will not be further issued.

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MESSRS. BRASDALE, LIMITED, of York, have won an arbitration case in which the firm was the defendant. Mr. W. R. Hopkinson, of Doncaster, claimed that the firm had supplied him with inferior bird-lime for making the "Deadly Fly Trap," and claimed £2500 damages. The Official Referee, however, did not think the plaintiff had established his case, and gave judgment for the defendant with costs.

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MR. I. H. HEAP, M.P.S., writes us, in connection with his announcement on page 52 of last week's advertisement sheet, to point out that Messrs. Hirst, Brooke and Hirst, of Aire Street, are his Leeds agents.

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MESSRS. BURROUGHS, WELLCOME AND Co. inform us that they have been awarded a special First-Class Certificate for "Tabloids" of pure compressed tea at the Hobart (Tasmania) Exhibition, 1894-1895. This is the highest award, and is equivalent to a gold medal.

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MESSRS. INGRAM AND ROYLE, LIMITED, of 53, Farringdon Street, London, E.C., ask us to note that their firm has been registered as a limited liability company, for private reasons.

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MR. JAMES D. BOWERS, pharmaceutical chemist, Eastgate Street, Chester, is retiring from business, and announces that all his proprietary rights, recipe and prescription books, etc., have been acquired by Messrs. Cheers and Hopley, of Northgate Street, Chester, where the chemist's stock will shortly be removed.

Personal Notes.

MR. LLEWELLYN JONES, of Lancaster Square, Conway, has fitted up a dark-room for changing and developing plates.

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DR. E. B. TYLOR has had the title of Professor of Anthropology conferred upon him by a Statute of Congregation of Oxford University.

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MR. J. B. NAGELVOORT has been appointed Professor of Applied Pharmaceutical Chemistry at the Illinois College of Pharmacy.

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MR. H. KREMER, Ph.G., has been appointed Professor of Botany, Materia Medica, and Pharmacognosy, at the same institution.

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MR. FRANK BROWNE, Assistant Government Analyst at Hong-Kong, is Honorary Secretary to the Hong-Kong Football Club. He recently delivered a lecture on "Argon" at a meeting of the Odd Volumes Society, Hong-Kong.

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MR. CHARLES NOTTIDGE MACNAMARA, of the Westminster Hospital, has been chosen Bradshaw Lecturer at the Royal College of Surgeons for the ensuing year.

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MR. GEORGE MURRAY, of the Natural History Museum, Cromwell Road, has been promoted to the keepership of the department of botany, in succession to Mr. W. Carruthers, who retires on superannuation.

Advertisements in the Pharmaceutical Journal.

ALL ADVERTISEMENTS must be sent to the Office, 5, Serle Street, Lincoln's Inn, W.C., where replies to prepaid advertisements may be addressed, and will be re-directed free of charge. Postal Orders should be made payable at Lincoln's Inn, W.C., to STREET BROS. Cheques should be crossed "London Joint Stock Bank."

PREPAID ADVERTISEMENTS.—Advertisements of Assistants Wanted, Apprenticeships, For Sale, Partnerships, Businesses for Disposal, Businesses Wanted, and Premises to Let are charged as follows:—Fifty words or less, 8s. 6d. Each additional ten words or less, 6d.

ADVERTISEMENTS of a general character are inserted at 4s. 6d. each for seven lines (50 words) or less, and each additional line of seven words, 6d.

FREE ADVERTISEMENTS.—Advertisements of Assistants seeking Engagements will be inserted Free of Charge, subject to conditions mentioned in each number of the Journal.

CALMNESS IN EMERGENCY.—Dr. Wier Mirrhill, lecturing to a school of nurses lately upon the necessity of self-control in emergencies, told the following incident:—"One of his patients, while in a low, nervous condition, swallowed by mistake a dose from the wrong bottle. She shrieked out that she was poisoned. One of the nurses screamed, 'aconite!' and began to cry hysterically. The other nurse, seeing that the patient was going into convulsions from terror, when relief would be impossible, said coolly: 'Don't be frightened. Look here,' taking a mouthful of the dose herself. She then went outside and rid her mouth of it, procured an emetic and sent for a doctor and a stomach pump. Her calmness saved the life of the patient." (*Popular Science News*).

Exchange.

[Notices of books, apparatus, etc., for exchange, of reasonable length, are inserted free in this column. They should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C.," and must not partake of the nature of ordinary advertisements.]

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

OFFERED.

HUMBER DIAMOND FRAME SAFETY, detachable pneumatic non-slipping tyres, plunger brake, hammock saddle, guaranteed perfect, new at Easter. Sacrifice, £7 7s.—Pharmaceutical Chemist, 77, Welbeck Street, London, W.

MICROSCOPE FOR SALE, Beck's star, two objectives, 1 in. and $\frac{1}{2}$ in.—Henry, 16, Parade, Forest Hill, S.E.

DOBSON'S BLACK-LEG DRINK. What offers?—Row and Son, Braintree.

'CHEMISTRY, THEORETICAL, PRACTICAL AND ANALYTICAL,' published by Mackenzie, 8 parts, bound cloth, unsoiled, 40s. cost double.—Watt, Chemist, West Hartlepool.

LABORATORY FITTINGS.—For sale, at any reasonable offer, including over 100 bottles containing all ordinary metallic salts, and about five dozen reagent bottles. Full details from Simpson, Stonebridge Park, Willesden.

STEAM JACKET PAN.—Jacket and pan all copper-tinned inside, with connections, holds 110 gallons. Price, £30.—Moss, Chemist, 13, Station Road, Ilkeston.

FACILE HAND CAMERA, rectilinear lens, automatic changing, waterproof cover, cost £5 12s. 6d. Adams' $\frac{1}{2}$ -plate changing box, cost 50s. Sell, or exchange for $\frac{1}{2}$ -plate apparatus.—Green, 355, Wandsworth Road, S.W.

SURPLUS NEW STOCK.—Sulphur tablets, 2 cwt., 85s.; 1 cwt., 36s.; $\frac{1}{2}$ cwt., 37s.; under, 6d. lb. Carriage paid.—J. M., 95, Humberstone Road, Leicester.

CHEMICAL BALANCE (Becker's), mahogany glass case, to carry 50 grammes each pan, sensible to $\frac{1}{2}$ milligramme, rider, apparatus, etc., new; cost 71s. 8d. Also Stephens' Materia Medica Collection, cost 50s. Offers to A. Edward, 32, Framfield Road, Highbury, London, N.

RICH GOLD BRONZE, 1 lb. post free for 1s. 11d., or exchange.—Hare, Chemist, Nottingham.

BOOKS.—'Attfield's Chemistry,' 4th edition, 'Year-Book of Pharmacy,' 1870. Wanted, Martindale's 'Extra Pharmacopoeia,' last edition.—Row and Son, Braintree.

TOOTH FORCEPS.—Twelve in mahogany case, no worse than new, by Mather, cost 80s., cash offers (approval).—Wannop, Tow Law, Darlington.

BLOOD is most certainly detected by a spectroscopic examination and the production of crystals of hæmin, but Sohär (*Zeit. für Anal. Chem.*) recommends the gualacum test as still valuable. He mixes the aqueous liquid in question with tincture of gualacum (1 Gm. in 100 C.c. abs. alch.), and filters. The constituents of blood, if the latter be present, will be left on the filter with the finely divided resin. A blue colour is then produced on shaking up the filter with Hænefeld's mixture (turpentine, alcohol, and chloroform, 200 parts each, with glacial acetic acid and water, 2 parts each). Absence of colour proves absence of blood.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, JUNE 1.

Pharmaceutical Cricket Club v. St. Mark's (Surbiton). Train leaves Waterloo at 2.5 p.m.

MONDAY, JUNE 3.

Pharmaceutical Cricket Club v. Cheam Common. Train leaves Waterloo at 10 a.m.

Geologists' Association (London).

Excursion to Fenny Compton. Leave Banbury by train at 8.47 a.m.

TUESDAY, JUNE 4.

Royal Institution of Great Britain, at 8 p.m.

"Thirty Years' Progress in Biological Science" (Fourth Lecture), by Professor E. Ray Lankester.

Geologists' Association (London).

Excursion to Hook Norton. Leave Banbury by train at 11.45 a.m.

Pharmaceutical Society of Great Britain.

Benevolent Fund Committee.

Finance Committee.

General Purposes Committee.

WEDNESDAY, JUNE 5.

Pharmaceutical Society of Great Britain, at 11 a.m.

Council Meeting.

Geological Society of London, at 8 p.m.

Evening Meeting.

Edinburgh Chemists', Assistants', and Apprentices' Association.

Botanical Excursion to Blackford Hill. Meet at Blackford Hill Station at 8.30 p.m.

THURSDAY, JUNE 6.

Royal Institution of Great Britain, at 8 p.m.

"The Instruments and Methods of Spectroscopic Astronomy" (Third Lecture), by Dr. W. Huggins.

Linnean Society of London, at 8 p.m.

"On a new Diatomum," by George West.

"On a new genus of Siphonous Algae, *Pseudocodium*," by Mde. van der Boese.

"On the True Nature of *Mobiusispongia parvicornis*, Duncan," by A. Vaughan Jennings.

"On a new genus of Foraminifera, *Raphidoceras conica*," by A. Vaughan Jennings.

Chemical Society, at 8 p.m.

"On the Molecular Refractions of Dissolved Salts and Acids," by Dr. Gladstone and W. Hibbert.

"A Comparison of some Properties of Acetic Acid and its Chloro- and Bromo-Derivatives," by Spencer Pickering.

"B.P. Dinaphthyl and its Quinones," by F. D. Chattaway.

FRIDAY, JUNE 7.

Royal Institution of Great Britain, at 9 p.m.

"Phénomènes Physiques des Hautes Régions de l'Atmosphère," by Professor Alfred Cornu.

SATURDAY, JUNE 8.

Royal Institution of Great Britain, at 8 p.m.

Elizabethan Literature: "The Masque," by Professor Edward Dowden.

Geologists' Association (London).

Excursion to Chelmsford. Leave Liverpool Street (G.E.R.) at 2.35 p.m.

Cricket News.

MUTER'S VERSUS WILLS'.—This match was played at Nunhead on Saturday, May 18, and resulted in a victory for the former, the scores being, S.L. School of Pharmacy, 112, and Metropolitan College of Pharmacy, 62.

Pharmaceutical Journal

SUPPLEMENT

LONDON, JUNE 8, 1895.

Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

A Weekly Record of Pharmacy and Allied Sciences.

The oldest Journal addressing Pharmacists.

Circulating in the United Kingdom, France, Germany, Austria, Italy, Russia, Switzerland, Canada, the United States, South America, India, Australasia, South Africa, etc.

Editorial Office: 17, BLOOMSBURY SQUARE, W.C.

Publishing and Advertising Office, 5, SERLE STREET, W.C.

PUBLISHED WEEKLY, PRICE FOURPENCE.

AN AVERAGE OF 7,000 COPIES PRINTED WEEKLY.

ANNUAL SUBSCRIPTION, INCLUDING POSTAGE, 10s. 6d.

In addition to being the sole periodical publishing full and complete reports of the transactions of the Pharmaceutical Society and of the British Pharmaceutical Conference, the JOURNAL records the proceedings of pharmaceutical and other scientific societies throughout the country, and chronicles all important advances in pharmacy and allied subjects in this country and abroad. Reviews of new scientific and technical works form an important feature in the JOURNAL, and its pages are also open for the discussion of matters of importance to British pharmacists generally, as well as for the purpose of supplying special information desired by subscribers.

The JOURNAL is supplied from the Publishing Office, 5, Serle St., Lincoln's Inn, W.C., post free for twelve months to any address throughout the world, on receipt of remittance for Ten Shillings and Sixpence.

HOW TO FIT UP A DARK-ROOM.

Dark-room is, of course, a misnomer, as luckily for us we are able to manipulate our dry plates by a red light with perfect safety; and may even have plenty of red light, provided the quality is right.

To the chemist who desires to fit up a dark-room for changing plates only, a permanent room may become a great nuisance, and it is therefore shown how a corner of the shop, a room, the drug-room, etc., may be utilised. Against the wall have two 2-inch battens nailed, 6 ft. 2 in. long, and 3 feet apart. At the top of the battens drive a hole through big enough to take a stout screw and

as shown in Fig. 1, made of $\frac{3}{4}$ -inch stuff. At A drive two holes to take the screws. Each side should be just under 3 feet, that is just small enough to go in between the battens nailed to the wall. At B drive in a stout screw-eye. Now place this frame in between the battens, put in the screws, and screw on the nuts, not too tight, but just so as to allow the frame to move freely. Now in the wall, about 4 feet above the top of the frame, put in a little wheel on its screw, through which should be run the cord, as shown in Fig. 2.

We have now the skeleton, which only wants clothing to complete. Its clothes are made of black twill, lined with a double thickness, or even one will do, of yellow twill. Both these can be obtained wholesale from the Winterbottom Book Cloth Co., of 51, Aldersgate St., London, E.C. The top will, of course, be all plain sailing, except that a little piece to spare should be allowed next the wall so as to pre-

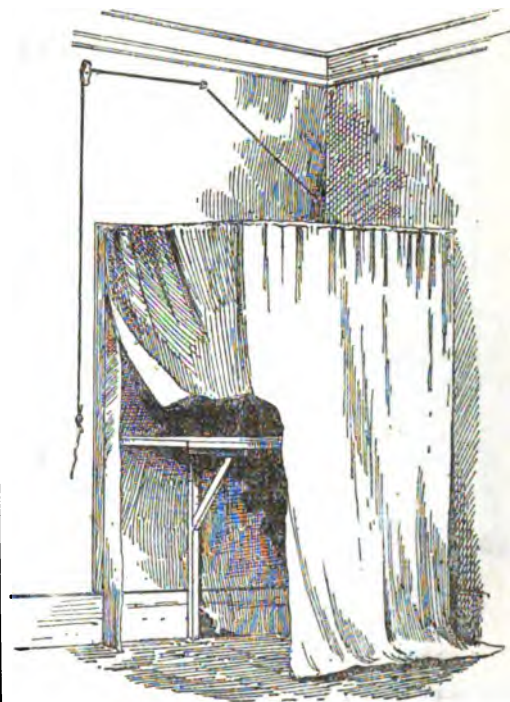


Fig. 2.

vent light from creeping in there, and a bit of thin lath nailed over this flap piece will keep it close to the wall. The sides and front must be sufficiently long to lie on the floor when in position, and to the one side, that not shown in the figure, an extra lap of about 6 inches should be allowed to overlap by the batten. The side turned back in the illustration must also overlap, but only about three inches; the top piece must be stitched to the front and sides, and also

Fig. 1.

out. Have a three-sided square, if it may be so called,

fastened to the top laths to keep it trim and tidy. To the screw-eye B (Fig. 1) attach a cord, which shall, as shown in the figure, be used to draw up and let down the dark room; at each side should be sewn small rings to fasten on to small hooks or screwheads, so as to keep the cloth close up the wall.

When required for use the dark-room can be let down by merely undoing the cord, and by fastening up the sides by means of the rings and hooks. When done with, it can be pulled up out of the way. The total cost of this, provided, of course, one has any sort of carpentering capacity, will be nominal, and doubtless some one can be found with better sewing powers than the average chemist to do the needlework. It is quite out of the way when not in use, and there is ample room for all plate changing that will be required, and a flap shelf made to let down will, of course, be essential.

We now come to the lighting of this dark-room. A paraffin or oil lamp is a nuisance, and it is therefore strongly recommended that, where possible, the dark-room should be built near a window, when a piece of

used under carpets, in order to ensure no leakage of light. The principal points to be observed about this room are that the door must shut against a fillet, half-inch, lined with felt, and should project half-an-inch below the floor; a key-hole will not be required, merely a stout button or hook to keep it shut from the inside. The window should be glazed with ground glass, the ground side inwards, then a sheet of ruby glass, and then deep orange or ruby fabric, and should be made to slide back so as to let in white light when required; outside the window should be a small shelf on which to stand a lamp at night. Accept the advice learnt from painful experience, never put a lamp inside these small dark-rooms.

If the dark-room is to be put out in the yard or garden, then besides the flat roof have a ridge roof of corrugated iron or match-board put on, and if the latter, cover it with tarred felt. Do not have the space between the ridge roof and flat roof covered in at the sides; leave this open for ventilation. A badly ventilated dark-room becomes in summer a little Hades—it spoils the temper, spoils the negatives, and causes headaches and general lassitude; therefore always have good ventilation. This can always be secured by means of a couple of 3-inch zinc pipes, one let in close to the floor, the other in the roof, and if bent as shown herewith (Fig. 4), no light will get through.

When to be used for developing, a cistern and sink are, of course, absolutely necessary. Small cisterns

to hold a few gallons, which can be fastened to the wall of the room, can be obtained from D. Allan, 157, Whitfield Street, Smithfield, W. From the same maker may also be obtained the sink, which should be lead-lined, of course, and this can be obtained with legs and stand complete. Of course a waste pipe must be provided, and beware of the homely pail placed underneath the sink. This always overflows just when you are in the middle of developing, and you must either spoil your plate or else paddle around in a slop till you can open the door safely and mop the mess up. Always lead the waste pipe outside, then if there is an overflow it will not be in the dark-room.

When a sink is fitted up in a dark-room it is advisable to have a cover of wood to lay over it, thus forming a shelf or bench for changing plates, etc. A shelf or two will be handy, and should not be omitted.

We now come to the light. Daylight will, of course, strike one as most convenient, and for changing plates it is all right, but for developing the use of a paraffin lamp placed outside the dark-room is strongly recommended. The light of this is practically constant, and therefore it enables one to judge of the negatives far better.

The most important thing in respect to the light is the coloured glass or medium. Glass or fabric may be used, and if you obtain a good glass, plenty of light may be used. It may safely be said, however, that from spectroscopic examination of many commercial glasses there are very few that are really satisfactory. It is preferable to make one's own light filters as follows. The method is not original, but it is very good. Three so-called aniline dyes are required—corallin rouge, fuchsine, and aurine; besides these some plain collodion.

The collodion is merely pyroxylin, 3 grs.; methylated spirit (the old, not the new nauseous rubbish), $\frac{1}{2}$ oz.; methylated ether, $\frac{1}{2}$ oz.; castor oil, 5 drops. At least 3 oz. of this should be made and put into three $1\frac{1}{2}$ oz. bottles. To each bottle now add about 10 grs. of the dyes, one dye in each bottle, and shake thoroughly. Allow to stand some hours, and if all the

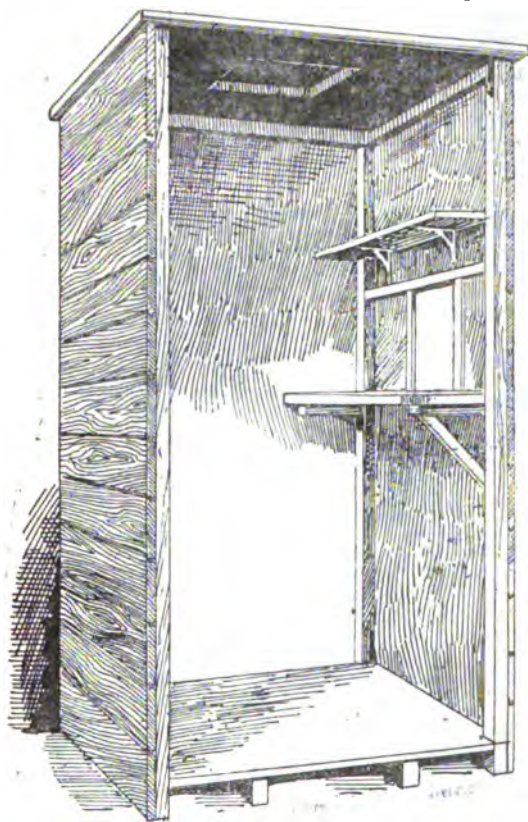


Fig. 3.

the black twill about 12 inches square can be cut away and deep ruby fabric sewn in its place. This should be about 4 feet from the ground. If the window of the room is high up, or there happens to be a skylight, then make the top of two thicknesses of ruby fabric and one of yellow twill, and this will be safe and give plenty of light.

Where the chemist himself wishes to become a photographer, or desires to fit up a dark-room for developing as well, then he should have one made of match-boarding, as shown in Fig. 3, which can be knocked up by a carpenter at very little cost. Inside it should be lined with brown felt paper, such as

dye has dissolved, add another 5 grains and again shake. What is wanted is a saturated solution of the dye; when this is obtained allow the collodion to settle. Take three pieces of window glass of the required size and coat with the collodion. This requires some little practice, but if for a 12-inch square about half-an-ounce of the collodion be poured on to the middle in a pool, it will be found that by tilting the glass first to one corner and then to the others in turn it will flow over the whole of the glass and form an even coating, when it can be laid on a level slab to set and dry. Practising with olive oil is advisable first, and if no experience has been undergone of collodionising plates, do not attempt it in the drawing room, and do not wear cuffs, but do it in the scullery and turn up your shirt sleeves, because generally a beginner will put as much collodion on the floor or up his sleeve as he will on the plate.

If fabric is preferred, it can be obtained commercially, as already stated, but for home make the fuchsin is soluble in water, and a strong saturated solution should be made, allowed to settle, and be decanted or filtered, and well-washed calico suspended in it for an hour, then taken out and hung up to dry. Corallin rouge, also known as peonin, and the water soluble variety should be obtained, a saturated solution of this should be made, and the white of one egg beaten up added to every 10 ozs. with a little magnesia, and the calico dyed. Aurin may be treated in the same way, but collodion is far preferable and easier to use.

We have now three screens, two deep red and one deep orange. All three can be used for colour-sensitive plates, the fuchsine and corallin for very rapid plates, the corallin and aurine for slow plates, and the aurine screen alone for bromide paper. If collodionised glasses are used they may each be fitted into a frame which can be made to slide backwards and forwards, so as to obtain what light you like. If fabric or dyed calico, then small blinds may be made, or even flaps fastened at the top with a bit of thin cane at the bottom, and a ring to fasten to a hook below the window, and also the same ring may fasten to a hook above the window to hook them out of the way, or the fabric may be mounted on thin wood frames and made to slide.

We have now practically finished the fitting up of the dark-room, and we have only the working utensils to consider. These should include 2 drachm, 2 oz., 4 oz., 10 oz., and 20 oz. measures. Dishes, of course, must be chosen, as far as regards size, to suit the plates, but if all customers are to be catered for, then quarter, half, and whole plate dishes should be furnished, also two 15 x 12; larger than this it is not necessary to go. For fixing it is well to use the upright porcelain or granitine troughs with grooves, into which the plates can be placed. They are far more convenient than the usual flat dishes, they take up less room, and the solution does not evaporate so quickly, because there is less surface exposed to the air.

Bottles filled with hypo solution, and alum and acid should also be provided, so that when a customer comes in and wants to develop, you can have everything ready for him. It would be, of course, difficult to make up solutions to suit everybody, but if 10 per cent. solutions are kept or prepared there will be no difficulty in satisfying all.

FORMULÆ AND PRACTICAL DIRECTIONS.

[The formulæ and directions for working here given are specially compiled for pharmacists by a practical chemist and photographer, who will be pleased to supply any special information required, or to answer photographic queries. Letters should be addressed "Editorial Department, 17, Bloomsbury Square, W.C.," with the word "Photography" in upper left-hand corner of envelope.]

A GOOD INTENSIFIER.

Intensifiers are always a trouble to amateurs; in the first place the majority contain perchloride of mercury, and this they cannot always obtain, and then they get into endless trouble with mercury intensifiers.

Solution No. 1.

Potassium bromide	1 oz.
Copper sulphate, of each	8 ozs.
Distilled water, to make	

Solution No. 2.

Silver nitrate	1 oz.
Distilled water, to make	8 ozs.

Directions for Use.—Lay the well-washed negative or bromide print in No. 1 solution till bleached right through, well wash, and then immerse in solution No. 2 till it has darkened right through, then wash, and place for a few minutes in a clean fixing bath, and again wash.

Of course it may be objected that the use of the second fixing bath entails a lot of trouble, but really this is not much, and the results obtained are certainly permanent and good. For those who prefer a mercury bath—and if properly used such a bath is hard to beat—the now well-known potassium silver-cyanide intensifier commonly but erroneously called Monckhoven's may be made.

Solution No. 1.

Mercury perchloride	100 grs.
Hydrochloric acid, pure	30 m.
Distilled water, to make	10 ozs.

Solution No. 2.

Silver nitrate	200 grs.
Distilled water, to make	10 ozs.
Potassium cyanide	q. s.

The proper method of making this solution is to dissolve the silver nitrate in 5 ozs. of the water and 200 grs. of cyanide in about 1 oz. of distilled water, place the silver solution in the bottle, and add the cyanide in quantities of about 1 drachm at a time, shaking thoroughly after each addition. A curdy white precipitate will be formed, and as more cyanide is added this will gradually redissolve, care must be taken that all the silver cyanide is not redissolved; some undissolved precipitate must be present or else this solution will attack the image.

Directions for use.—The negative must be thoroughly freed from hypo, and should be either treated with anthion or with alum and acid solution, then immersed in No. 1 till bleached right through, then washed for twenty minutes in running water, and then immersed in No. 2 till blackened through, when it should be again well washed.

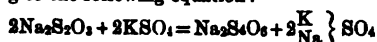
If the negative is left too long in No. 2 solution the details in the shadows will be eaten out.

ANTHION.

The best servant and the worst master the photographer has is "hypo," the familiar nickname of hyposulphite or thiosulphate of soda. With it he fixes his negatives and his prints, and when it becomes dirt, that is, matter in the wrong place, he ruins his negatives, spoils his prints, and generally loses his temper. How to get rid of it has always been a weariness of the flesh, long washing in running water, specially constructed tanks, frequent overflowings of the domestic bath-room basin, etc., and consequent troubles with the ladies of the household are but too familiar, but now all our troubles are ended, thanks to Schering of pyro fame. He has introduced "Anthion," which is persulphate of potash, and a few minutes' bath in this soon destroys our old enemy—"hypo." Potassium permanganate, KSO_4 , is a very fine crystalline powder, only sparingly soluble in water about 1 per cent. at 59° F. It is a stable salt when kept dry, but when in solution or exposed to the air gradually decomposes, giving off oxygen, and it is this very property which makes it valuable for destroying the last traces of

PHOTO-CERAMICS.—W. Ethelbert Henry, who is now giving demonstrations at the Imperial Institute on this branch of photography, has written in collaboration with H. Snowden Ward a handbook on the subject, which will shortly be published by Dawbarn and Ward, 6, Farringdon Avenue, at the popular price of 1s.

hyposulphite, as it oxidises it into tetra-thionate of soda, according to the following equation:—



From this it is evident that 224 parts of hypo require 135 parts anthion for complete conversion.

There have been, of course, numerous hypo-eliminators suggested, such as eau de javelle, permanganate, iodine, etc., but these unfortunately attack the silver image, whereas anthion does not appear to do so. It is best used in a solution 1: 200 as follows:—The plate or print should be washed for about ten minutes in running water, then immersed for five minutes in the above solution, the dish being meanwhile well rocked, and allowing about 3 oss. of solution for one plate or four prints about half-plate size; the print or plate should then be immersed in fresh water for five minutes, and again treated with anthion, and again washed.

A very ready way to test whether all the hypo is out is as follows:—To about a drachm of the last washing water add three drops of a 1: 20 silver nitrate solution, probably a white precipitate of silver chloride will be formed, this can be disregarded as long as it remains white, but if it soon turns yellow or pale brown then all the hypo is not eliminated, and a further treatment with anthion should follow.

There should be a very good sale for this, as the washing of prints and plates is always a trouble. It may be obtained from Messrs. A. and M. Zimmerman, 6 and 7, Cross Lane, E.C.

A RELIABLE REDUCER.

Reduction of the density is an operation somewhat dreaded by amateurs, because it has generally been necessary to use two solutions, the action of which was uncertain, and which would not keep. Belitzski's solution, however, will keep indefinitely, and can be used over and over again.

Potassium ferric oxalate	$\frac{1}{2}$ oz.
Sodium sulphite.....	$\frac{1}{2}$ "
Oxalic acid	75 grains.
Hyposulphite of soda	24 oss.
Distilled water, to make	10 "

The above-named potassium ferric oxalate, which occurs in brilliant emerald green crystals, must not be confounded with ferric oxalate, which is a yellowish brown powder of the formula $\text{Fe}_2(\text{SO}_4)_3$, the potassium double salt being $\text{K}_2\text{Fe}(\text{SO}_4)_4$. Dissolve the potassium salt in 5 oss. of water, add the sulphite, and shake thoroughly till it is all dissolved; the solution becomes blood red from the formation of ferric sulphite, to this solution add the oxalic acid in crystals and stir or shake till the solution turns green again, then decant from any undissolved acid, and add the hypo and sufficient water to make the total bulk measure 10 oss., and bottle.

This may be applied to a negative irrespective of what developer was used, and also immediately it comes from the fixing bath, though it is just as well to rinse the excess of hypo off; as soon as the negative is sufficiently reduced it can be taken out and well washed as usual.

The reducer will keep indefinitely, and may be used over and over again till it becomes yellow or orange, so that the colour of the solution is a good guide as to the efficiency of the reducer. It causes no precipitate on the negatives, and it tends to harden the film, so that in warm weather it prevents frilling and blistering.

It is equally applicable to bromide papers and opals or lantern slides, and its use is so simple and easy that it is difficult to see where it can go wrong, and it is a great favourite of the writer.

A STAIN REDUCER.

One of the latest claimants to favour amongst photographers is thio-carbamid or thiourea, $\text{C}_2\text{H}_4\text{N}_2\text{S}$, and as it is very efficient for removing the stains of pyro from the films of negatives, the fingers, clothes, etc., it should be recommended, or may be made up in a solution.

Thio-carbamid	30 grains.
Chrome alum	30 "
Citric acid	40 "
Distilled water, to make.....	10 oss.

The negative may be soaked in this for ten minutes, and then well washed, or the hands or fingers well rubbed with a coarse rag dipped in the solution.

Answers to Photographic Queries.

RHEUM enquires the cause of an explosion which occurred when a mixture of carbonate and sulphite of sodium was rubbed up in a glass mortar with a little water.

This has nothing to do with the ingredients which were intended for developing, but can only be ascribed to sudden disintegration of the glass from some reason or other, an occurrence which has before now been noted in pharmaceutical circles.

LANTERNIST asks what precautions are necessary to obtain a dense negative of a page of a book for making lantern slides by contact, and whether it is possible to obtain one sufficiently dense without intensifying? He also asks for information as to rapidity of plate best suited, developer, and details of development.

It is possible to obtain a result satisfactory in every way if one or two conditions are fulfilled. The only plates to use are the so-called photo-mechanical or process plates, such as the Imperial or Ilford, or Mawson and Swan, these are very slow, requiring about four times the exposure of an Ilford ordinary. The exposure must be gauged as correctly as possible, and with F. 16 and a good light, such as is now obtainable about mid-day, the exposure would be about 10 seconds. The best developer is hydrokinone with plenty of citrate, or else glycin.

Hydrokinone Developer.

No. 1.	
Hydrokinone	4 grains.
Potassium metabisulphite	3 "
Bromide of potassium	$\frac{1}{2}$ grain.
Water, to make	1 oz.

No. 2.	
Caustic potash	10 grains.
Water	1 oz.
Citrate of potash	15 grains.
Mix in equal parts.	

Glycin Developer.

Glycin	6 grains.
Sodium sulphite.....	30 "
Potassium bromide	$\frac{1}{2}$ grain.
Sodium carbonate	44 grains.
Distilled water, to make	1 oz.

This is a slow developer, but gives very clear negatives. The main point in developing is to keep the lines clear, and should there be any signs of the lines veiling over, the development should be stopped and the plate well rinsed and fixed immediately. If the exposure was correctly timed, development may be pushed till ample density is obtained without any clogging of the lines, but if after development there is insufficient density, then the cyanide intensifier may be used.

F. V. GUY asks for a really good formula for a combined toning and fixing bath in one solution to put up for retail.

If there is one thing more than another which is likely to bring discredit on a dealer it is a combined bath. Amateurs will not use it properly. A combined bath contains gold and hyposulphite, and the principle of the action of a combined bath is first to fix and then to tone. A print is prepared on paper which contains free acid, generally citric acid. Now, when an acid is added to hypo a decomposition occurs, and sulphurous acid and nascent sulphur are set free, and these, in contact with the silver salts of the image, give rise to sulphur salts of silver, which invariably lead to subsequent fading. A combined bath, if properly used, is no worse than any other, but when improperly used, well—better not print at all. Still, being asked for a combined bath, the only formula which is any way satisfactory is given:—

Sodium hyposulphite	$\frac{1}{2}$ oz.
Potassium sulphocyanide	15 grains.
Sodium chloride	30 "
Gold chloride.....	1 "
Water, to make	34 oz.

Dissolve in the above order.

Directions for use.—Immerse the prints when removed from the printing frame in a solution of salt, $\frac{1}{2}$ oz.; washing soda, $\frac{1}{2}$ oz.; water 10 oss. for ten minutes, then rise well and immerse in the toning bath. This bath will keep indefinitely and may be used to tone an area of print equal to 40 square inches. If used for more prints they will not be permanent.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, JUNE 6, 1895.

Since our last report business has necessarily been restricted, owing to the Whitetide holidays. Prices do not show any great alteration, and the more interesting features may be briefly summarised. Cream of tartar and tartaric acid are quiet, sulphate of ammonia is dearer, and chrysophanic acid is steadily moving up. Full details will be found below:—

ACID, CARBOLIC.—A quiet market, and little business results. *Crystal acid* is a shade firmer, but other varieties are unaltered. Quotations:—*Crystals*: 34° to 35° C., 5½d. per lb.; 39° to 40° C., 6½d. per lb.; 39° to 40° C. (*detached crystals*), 7½d. per lb., these prices being for bulk quantities in 2 cwt. drums. *Crude*: 60 per cent., 1s. 7d.; 75 per cent., 1s. 10d. *Cresylic (Liquid Carbolic Acid)*: 1s. 1d. per gallon for 95 per cent. acid.

ACID, CHRYSOGRAPHIC.—Manufacturers report a very firm market with advancing prices. The current quotation is now 9s. 6d. to 10s. per lb., according to quantity.

ACID, CITRIC.—Steady at previous rates. It is still quoted at 1s. 1½d. to 1s. 2d., according to quantity.

ACID, OXALIC.—In fair demand at unaltered prices. Manufacturers quote at 3½d. net *ex rails*.

ACID, TARTARIC.—Quotations are unchanged, but the market is quiet. *English brands* of acid are still quoted at 11d. to 11½d. on the spot, and *foreign*, both in *powder* and *crystals*, at 11d.

AMMONIA SALTS.—*Carbonate* unchanged at 3½d. to 3½d. *Liquor* steady at 3d. to 3½d. *Sal ammoniac*: The price for first quality is maintained at 39s., with *seconds* at 37s. *Sulphate* is dearer, and at the close a firm market. *Grey 24 per cent.* is now worth £10.

ASHES.—Unaltered. *American* are worth 40s., and *pots 22s.*

ARSENIC.—Remains very firm, and supplies are small. *Best white powder* is still worth 15s. 3d. to 15s. 6d.

BLEACHING POWDER.—Unaltered, and in fair demand. In London it is quoted at £7 5s. to £7 15s., whilst the Liverpool quotation is still £7 10s. to £7 15s. *f.o.b.*

BORAX.—The *Syndicate* prices are 20s. for *crystals*, with *powder* at 21s. In second hands it offers at 1s. to 1s. 6d. *less*.

COAL-DISTILLATION PRODUCTS.—*Benzole*: Unchanged, 50 per cent. is still worth 11d. per gallon, and 90 per cent. 1s. per gallon. *Pitch* is lower, at 36s. per ton *f.o.b.*, whilst *Tar* is unchanged at 11s. 6d. per barrel of 40 gallons.

COPPER SULPHATE.—A very firm market at advancing prices, ordinary brands are still quoted at £15, but special makes are now worth £15 15s.

CREAM OF TARTAR.—Easier, and lower prices have been in some cases accepted. At the close *German* makes of *powder* are quoted at 71s. to 72s. on the spot, whilst good *white French crystals* are worth 69s. to 70s.

MERCURIALS.—At present unchanged, although in view of the firmness of quicksilver a corresponding all-round advance in mercurials is to be expected. For quantities up to 56 lbs. the current quotations are:—*Calomel*, 2s. 11d.; *corrosive sublimate*, 2s. 7d.; *red precipitate*, 3s. 2d.; *white ditto*, 3s. 2d.; *blue pill*, 1s. 8d.; *ditto ointment*, 1s. 8d.

PHOSPHORUS.—Very steady. *Sticks* are worth 2s. 1d. to 2s. 2d., and *wedges 2s.*

POTASH SALTS.—*Bichromate*: Steady at 4½d. to 4½d. *Chlorate*: Again a firm market, and in Liverpool

especially a large amount of business has been done at 5½d. per lb. In London the closing price is 5d. *Permanganate*: Small crystals 52s. 6d. to 53s. *Prussiate*: In London it is quiet at 8½d. to 8½d., whilst in Liverpool it has declined to 8d.

QUICKSILVER.—Steady. Importers maintain their prices at £7 10s. per bottle. In second hands the price is £7 8s. to £7 8s. 6d.

SALTPETRE.—British *refined* is steady at 22s. 6d. to 23s. 6d. on the spot, and in Liverpool it is quoted at 23s. 6d. in kegs, and 23s. in barrels.

SODA COMPOUNDS.—Unchanged. *Bicarbonate*: £7 5s. in London, and in Liverpool it offers at £6 15s. *Caustic* 70 per cent. £3, whilst 60 per cent. offers at £1 less. *Crystals*: 38s. *Hyposulphite*: £6 5s. per ton in 1 cwt. kegs (Liverpool).

THE DRUG MARKET.

THURSDAY, JUNE 6, 1895.

Business has been somewhat at a standstill in the Drug Market since our last report, owing to the holidays. Cocaine hydrochlorate has been again reduced in price. Essential oils are practically unchanged. Cod-liver oil is very firm, with every prospect of advancing prices. Full details will be found below:—

ARABICA.—Ten cases were included in the catalogues of the last drug sales, but not having been landed were not offered. The price asked is 2s. 6d. per lb.

CAFFEINE.—For small parcels in second hands it can be bought for 24s. to 25s., whilst for delivery, August to September, it is quoted at 18s. It may be noted that the price has at last been withdrawn from the current quotations of the makers, although it appeared at the rate of 16s. per lb., when the spot price was still higher than even at the present time.

CAMPHOR (Crude).—Firm at unaltered rates. The quotations are:—*China*: On the spot 160s., and for arrival, May to July steamer, 155s. to 160s., *c.i.f.* *Japan*: For arrival, June to August, 152s. *td.* Importers quote *Japan* at 170s.

CAMPHOR (Refined).—*English* and *German* makers' prices are unaltered, and the current quotations for 10 cwt. lots remain at 1s. 9½d. for *bells* and *flowers*, with *squares* 1s. 10½d., and proportionate rates.

CLOVES.—Quiet. Privately, business has been done in *Zanzibar* at 3½d., July to September delivery.

COCAINE.—The manufacturers have again lowered their prices for *hydrochlorate* 1s. 6d. per oz., and the current quotations are now as follows:—For 100 ozs., 14s. 6d.; from 25 to 100 ozs., 14s. 9d.; and for lots under 25 ozs., 15s. These quotations are for cocaine in tins, 1 oz. bottles being charged 3d. per oz. more.

COCHINEAL.—Unchanged. There have been sales privately of *black* at 1s. 2d.

CODEINE.—Prices remain unchanged, the current quotation being 10s. 3d. to 10s. 9d., according to quantity and brand.

COLOCYNTH.—*Turkey* continues scarce, as there have been no fresh arrivals. Holders ask 2s. for good apple. The price for fair *Spanish* remains at 1s.

COPAIBA.—Steady, but dull of sale. There have been sales privately of good bright *Maranhão* at 1s. 10d. down to 1s. 8d.; *Para* at 1s. 5d. to 1s. 7d.; and *Maracão* and *Bahia* balsam at 1s. 3d. to 1s. 5d.

GALLS.—Quiet, but steady. There have been sales of *China* on the spot at 55s.

INSECT FLOWERS.—*Hoffmann's* report notifies a more active demand in the Trieste market, and prices have risen about 10 per cent. all round. The current quotations are now:—Open flowers, 50s.; half-closed ditto, 78s.; closed ditto, 105s., London.

IPÉCACUANHA ALKALOIDS.—E. Merck, of Darmstadt, quotes the alkaloids of *ipecauanha* prepared according to the researches of Dr. Paul and Mr. Cowley (*vide Pharm. Journ.*, vol. liv., p. 111) in his prices current as follows:—*Emetine hydrochlorate* *cryst.*, 4s. 6d. per gramme; *cephaeline alkaloid* *cryst.*, 13s. 6d. per gramme.

IPFACUANHA.—There have been no fresh arrivals of *Carthagenia*, (*Columbian*) root, which is scarce. The price for fair, slightly damaged root is 3s. 6d. per lb. *Rio* (*Brazilian*) root has been selling privately at fully last sale's rates.

JALAP.—Holders of fair *Vera Cruz* still ask 11d. to 1s. for good sound root, and 8d. for damaged ditto.

MORPHINE.—Is still dull of sale, with a tendency to see lower prices. Nominally quotations are unchanged at 4s. 3d. per 1000 lots, and 4s. 5d. for smaller wholesale quantities. *Crystals* 2d. per oz. more.

MENTHOL.—Lower. On the spot holders offer white dry crystals at 14s. 6d., whilst for delivery it is quoted at 14s. c.i.f. terms.

OILS (ESSENTIAL).—*Almond*: The present price is 25s. *Star Anise* is quiet, but fairly steady. On the spot 6s. 4d. to 6s. 5d. is the price, whilst for shipment it is quoted at 6s. 5d. c.i.f. term. *Cajeput*: Quiet at 2s. 9d. per bottle. *Cassia*: Quiet; 4s. 10½d. to 5s is asked for oil showing 75 to 80 per cent. of cinnamic aldehyde on the spot, and for delivery it is quoted at 4s. 9d. c.i.f. terms. *Citronella*: Steady. On the spot 1s. 2d. to 1s. 3d. is the price for oil in tins. *Clove*: Dull of sale and declining. The nominal value is 2s. 7d. to 2s. 8d. *Juniper*: Finest Hungarian wood oil is quoted at 1s. 5d. *Lemon*: Some of the principal producers at Messina have lowered their price 2d. per lb. The quotation for a standard oil of guaranteed purity is 3s. 11d. f.o.b. *Lemon-grass*: 1½d. per oz. *Pimento*: 8s. 6d. per lb. *Pennyroyal*: 6s. 6d. is asked for new crop oil, against 4s., which was the price for old oil. *H. G. Hotchkiss'* oil is unchanged at 9s. 9d. to 10s. *Japanese* oil containing 40 per cent. menthol is worth 7s. 6d.; *dementholised*, 5s. 9d. to 6s.; and *Wayne County* oil 6s. 3d. to 6s. 6d. c.i.f. term. *English essential oils* continue to advance in price, and *Lavender* is now worth 90s. to 95s., with *Caraway* 6s. to 6s. 8d.

OILS (fixed) AND SPIRITS.—*Almond*: The current price is 1s. 1d. *Castor*: Steady at unchanged rates. *Fine Italian* oil is quoted at 30s. 6d. c.i.f. *Cotton*: Quiet, but steady. £18 to £18 5s. is the current quotation for refined oil, according to brand and package. *Coco-nut*: Steady. *Ceylon* is quoted at £22 15s. on the spot, *Cochin* at £24 10s. to £24 15s., and *Mauritius* at £22 15s. *Linseed*: Unchanged. On the spot in barrels it is quoted at £21. *Rape*: Steady. Refined oil is worth £23 on the spot. *Turpentine*: Very firm. *American spirit*, on the spot, is now quoted at 22s. 6d. to 22s. 9d. *Petroleum*: Unchanged. *American* oil is quoted at 5½d. to 6d.; *water white*, 7d.; *Russian*, 5½d. *Petroleum spirit*: *American*, 8½d. to 8¾d.; *deodorised*, 8¾d. to 9d.

OIL (COD LIVER).—*Isdahl's* brand is nominally quoted at 170s., but there is little offering, and prices will probably be further advanced.

OPIMUM.—*Turkey* is steadier, with rather more inquiries at the following prices: *Soft shipping* description, 11s. 6d.; *seconds ditto*, 11s. to 11s. 8d.; *best druggists'*, 9s. to 9s. 6d.; *seconds ditto*, 8s. to 9s. *Persian* remains very firm, and 12s. 9d. to 13s. is asked for the finest qualities.

ORRIS ROOT.—Finest *Florentine* root is quoted at 76s. 6d. per cwt. c.i.f., and for fine selected bold *Veronese* 56s. per cwt. c.i.f. is the price.

PERU BALSAM.—Quiet. Good quality balsam offers at 9s. 3d. to 9s. 6d. per lb.

QUASSIA.—Quiet, but steady, the spot value being £5.

QUININE SULPHATE.—Very firm, although business has been somewhat restricted. The chief item has been a sale of 20,000 ozs. of *B. & S.* and *Brunswick* at 1s. 0½d. on the spot, and October delivery at 1s. 1¼d. At the close there are further buyers of *B. & S.* and *H. B.* at these rates. The landings during May were 24,292 ozs., and the deliveries 130,784 ozs., making the stock on May 31 2,332,164 ozs.

SALICIN.—The makers' prices are unchanged. It is quoted at 8s. for 1 cwt. lots, with 28 lbs. at 8s. 6d.

SANTONIN.—Quantities of 1 cwt. are quoted at 5s. 5d. to 6s. 8d. net per lb.

SHELLAC.—Practically no business has been done since our last, and, although steady prices have been paid, the market is quiet.

TOLU BALSAM.—Steady. Privately 1s. 5d. is asked for good quality balsam.]

FRIEDRICHSHALL WATER.

We record with interest the successful opening of a new spring at Friedrichshall. The world-famous Friedrichshall spring, which has been continuously worked for upwards of fifty years, and was referred to by Baron Liebig as "a Treasure of Nature," has of late given indications that the combination of saline deposits which gave it its name was becoming exhausted.

Geologists were of opinion that this was simply due to the dissolving action of the water upon that portion of the vein of deposits which fed the spring, and that the same vein could as easily be struck and worked by another shaft. Borings were accordingly made, and a new spring found, with the satisfactory result that the water drawn therefrom proves to be practically identical with the originally yielded by the old Friedrichshall spring. The following analysis by Professor B. Fischer, of Breslau, compares with that of the old spring made by Professor von Liebig in the year 1846:—

Parts in 1000.

	Fischer, 1894.	Liebig, 1846.
Sulphate of Soda ...	5.9461	6.0569
" Magnesia ...	5.9624	5.1582
" Lime ...	0.7408	1.3456
" Potash ...	0.1707	0.1982
Chloride of Sodium ...	7.3112	7.9560
" Magnesia ...	4.7185	2.9390
Bromide of Magnesia ...	0.0072	0.1140
Carbonate of Soda ...	0.3168	0.0000
" Magnesia ...	0.0113	0.5198
" Lime ...	0.2193	0.0147
Carbonic Acid ...	0.2338	0.4050
Silicic Acid ...	0.0012	Traces
Oxide of Iron ...	Traces	Traces
Alumina ...	Traces	Traces
Total ...	25.6443	25.6955

The valuable combination of sulphates of soda and magnesia (in about equal proportions) with the chlorides of sodium and magnesia constitute the chief and unique value of Friedrichshall water. This combination renders the taste of the water singularly pleasant, wholesome, and cleansing to the palate. It has for many years enabled it to be used as an aperient, occasionally or habitually, with reliable and agreeable results and without violence. The results of experiments carefully conducted at a number of hospitals in Germany demonstrate that even when taken continuously Friedrichshall water gives rise to no derangement of the stomach or any other unpleasant secondary effects. Unlike most mineral aperients, its dose may, during prolonged use, be progressively reduced.

After a careful examination of the water, of its analysis, and of the ascertained results of its action as a customary aperient for occasional or continuous use, we can recommend the Friedrichshall water, as now bottled at the new spring, as being in every respect equal to the Friedrichshall water which, for the last fifty years, has been a favourite aperient with the medical profession on the Continent of Europe and in this country.—*British Medical Journal*.

ROYAL PHOTOGRAPHIC SOCIETY.—Since the Queen has granted the prefix of Royal to the old P.S.G.B., or Photographic Society of Great Britain, its membership has enormously increased, and with the founding of a higher degree with the title of Fellow, and the right to use the magic letters F.R.P.S., "things is wagging." Next month the Society moves into new and more convenient premises at 12, Hanover Square, Regent Street, W. The annual exhibition, which is held annually at 54, Pall Mall East, S.W., will, it is thought, this year be better than ever, and it is always the one exhibition of the year.

Personal Notes.

MR. ALEXANDER ELLIS, A.P.S., Chemist and Druggist, Dalton-in-Cleveland, has disposed of the business which he has conducted for the past twenty-seven years.

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MR. WALTER WRIGHT KINGSTON, A.P.S., who has purchased the stock-in-trade and trade recipes of Mr. Ellis, Skelton-in-Cleveland, will carry on the business as formerly.

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PROF. FRANKLAND has been elected a foreign associate of the Académie des Sciences, in the department of chemistry, in the room of the late Van Beneden.

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LORD RAYLEIGH has been awarded the Barnard gold medal for his discovery of argon by the trustees of Columbia College, New York, who thus follow the example of the National Academy of Sciences.

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MR. SPENCER C. BLACKETT—formerly well-known as a publisher on his own account—has been appointed manager of the firm of Kegan Paul, Trench, Trübner and Co., Limited.

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MR. GEORGE BENTLEY, the head of the eminent publishing firm of Richard Bentley and Son, who died at Slough on Wednesday, May 29, in his sixty-seventh year, had travelled in various parts of the world, and took special interest in the Holy Land. 'Temple Bar' owed much of its popularity to the personal attention bestowed on it by Mr. Bentley, who was known and esteemed by many authors.

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DR. VAN T'HOFF, the chemist and physicist, is to receive the Prussian *Ordre pour le Mérite*.

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MR. HERBERT SPENCER, the distinguished philosopher, was to be similarly distinguished, but has decided that certain often-repeated and strongly expressed opinions of his debar him from accepting the decoration.

THE SELBORNE SOCIETY.

The annual meeting and soiree of this Society was held on May 29, at 20, Hanover Square, and was attended by a large number of ladies and gentlemen. The Earl of Stamford presided at the meeting, held in the large hall, at which the report and accounts for the past year were presented for adoption. The Chairman, in opening the proceedings, read a letter from Sir John Lubbock, regretting his inability to be present, and speaking warmly of the work and objects of the Society. He presented the annual Report for adoption. The motion was seconded by Dr. Dendley Buxton, who spoke of the work of the Society in encouraging a love of nature and in following the precepts of Gilbert White. He also referred to the report of the branches and the methods adopted in making known the objects of the Association. Among other speakers were Mr. J. L. Otter, the hon. treasurer of the Society, and in the end the report and accounts were unanimously adopted. At the conclusion of the meeting the visitors dispersed into the various rooms to witness the display of a collection of relics of Gilbert White, lent by Mr. R. Holt White, and a Bibliographical Exhibition, arranged by Mr. E. A. Martin. Among other attractions were "informal talks" by Mr. Holt White on Gilbert White; Mr. Marshallman Wattson on the protection of insects; and Mr. E. A. Martin on the "Natural History of Selborne." There were also a performance of music by the Middlesex Hospital Vocal Quartette, and a number of microscopical exhibits by the members of the Quekett and the Royal Microscopical Societies.—*Standard*.

PROCESS WORK.—Half-tone and line block making is just now all the rage. Professional photography has been bad for some time, and process work has been boomed as the remedy. As a consequence a lot of half educated incompetent men have rushed into the business and cut the prices, and now that they find that even low prices will not tempt printers and editors to have bad work, they cry out that process work is no good. Yet the best firms are getting higher prices and doing more work than ever.

Trade Notes.

MESSES. HODGKINSON, PRESTONS, AND KING, wholesale druggists, Bishopsgate, London, were the victims of a fire which broke out at about eight o'clock on Saturday morning last. A two-storied building lying to the rear of the thoroughfare was for the most part destroyed, and the damage done was considerable, involving the destruction of a large quantity of chemicals of various kinds. No delay will be caused in the execution of orders, however, and business will be carried on by the firm the same as usual.

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M. F. WAGUET, 11, Rue du Parc-Royal, Paris, encloses samples of filter papers of Bernard Dumas' make, for which he has the concession. These papers are of a superior filtering quality, made from real rags and free from chlorine and iron. The hand folded filters are said to be much appreciated by all using them. The sole agents for the United Kingdom and Colonies are Messrs. J. L. Lyon and Co., 75, Mark Lane, London, E.C.

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MR. EDWARD PECK, chemist and druggist, East Dereham, Norfolk, makes a specialty of photographic mounts, etc., of all kinds, which he supplies wholesale. His five-guinea Sarum photographic set is $\frac{1}{2}$ -plate size, and fitted with Sarum lenses.

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THE CHEMISTS' AERATED AND MINERAL WATERS ASSOCIATION, LIMITED, gives notice that an Extraordinary General Meeting of the members of the Company will be held at Anderton's Hotel, Fleet Street, in the City of London, on Friday, the 14th day of June, at Three o'clock precisely, to consider the advisability of altering the Articles of Association of the Company by taking power to subdivide its shares, with the view of subdividing the 4,500 shares of £10 each into 45,000 shares of £1 each, and that at such meeting the following resolution will be proposed accordingly:—

"That Article 5 of the Articles of Association of the Company, which is in these words, 'The Company in General Meeting may from time to time increase the capital by the creation of any number of new Shares,' be altered by the addition thereto of the words, 'The Company may also subdivide its Shares.'"

Should such resolution be passed by the required majority, it will be submitted for confirmation as a special resolution to a second Extraordinary General Meeting to be subsequently convened, at which the necessary resolutions for subdivision of the shares as above will be proposed, and if passed by the required majority, submitted for confirmation as special resolutions to a third Extraordinary General Meeting to be subsequently convened.

THE VICTORIA UNIVERSITY.

The Victoria University, Manchester, conferred honorary degrees for the first time on May 29. Among those honoured were the Duke of Devonshire, Lord Derby, Lord Kelvin, the Marquess of Ripon, and the Principals of the affiliated Colleges at Manchester, Liverpool, and Leeds. In the evening a banquet was presided over by Dr. Leech, Chairman of Convocation. Lord Spencer, Chancellor of the University, responding to the toast of the evening, spoke of the important influence of the University in the northern counties of England, and of the great progress it was making. It had proved that high culture could be secured in manufacturing communities without in the slightest degree deteriorating the business capacity of commercial men. It had had to contend against considerable difficulties, including that of finance, and had triumphantly overcome them all. Men of wealth could find no more admirable way of expending their riches than in promoting higher education. In this movement there had been a strong push forward from the County Councils, particularly in respect of technical education. Successful technical education, however, was largely dependent upon general education, and in general education the Victoria University was doing an invaluable work. Lord Ripon and Lord Kelvin also spoke.—*Standard*.

Exchange.

[Notices of books, apparatus, etc., for exchange, of reasonable length, are inserted free in this column. They should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C.," and must not partake of the nature of ordinary advertisements.]

OFFERED.

LANCASTER'S MULTUM-IN-PARVO enlarging camera, to enlarge up to 10 by 8. Unused. What offers? cash or exchange.—Davis, 7, Sidney Terrace, Weston-super-Mare.
200 5 lb. VASRLIN TINS. What offers?—D. S. C. Reid, 156, New City Road, Glasgow.

'CHEMIST AND DRUGGIST,' a quantity of, some bound, any exchange, or small offer in cash.—F. G. Curtis, 46, The Broadway, Ealing, W.

MICROSCOPE for sale; binocular; in excellent condition; objectives, 2 in., 1 in., and $\frac{1}{2}$ in.; mechanical stage; complete in mahogany case, including a microtome, £6.—Simpson, Stonebridge Park, Willesden.

BOOKS.—Attfield's 'Chemistry,' 6th ed.; Muter's 'Chemistry'; Muter's 'Practical Chemistry'; Wills' 'Pharmacy,' 1867. B.P.; Wills' 'Materia Medica'; Muter's 'Materia Medica'; Smith's 'Guide'; Lescher's 'Elements,' etc. A useful selection for apprentices and students, 15s.—B., 107, Robert Street, Albany Street, London, N.W.

SAFETY.—Light, Diamond Frame Pneumatic, tangent spokes, balls everywhere, sacrifice, £5 10s.—Howard, 35, Orsett Road, Grays, Essex.

BOOKS.—Churchill's 'Operative Midwifery,' with plates; 'Wallace on Syphilis,' 2s. 6d. each, splendid condition.—Slack, 351, High Street, West Bromwich, Staffs.

BALANCE (Griffin's 6005).—Carry 100 grammes, show 1/5 to 1/10 mg., steel knife-edges, agate planes, pan-stops, rider, scarcely used. Cost £8, take £6 10s.—Harvey, Sibley, Loughborough.

PORTABLE ASSAY BALANCE, with rider to carry 2 grammes each pan, turn with 0.1 milligramme, fitted in mahogany case. New to order. Received too late for customer.—Allen, Chemist, Plymouth.

WATKIN'S EXPOSURE METER, cost 15s.; "Tod-Forret" Flash Lamp, 10s. 6d.; "Photoret," 10s. Used once. Sale, half-price.—E. J. Appleby, Pharmaceutical Chemist, Bath.

Partnerships Dissolved.

[From the London Gazette.]

Samuel Ralph Atkins and William Ralph Atkins, carrying on business as pharmaceutical chemists at Salisbury under the style of Atkins and Son. Debts will be received and paid by W. R. Atkins.

* * * * *

James Watson Black and George Dudley Short, carrying on business as chemists and druggists at 39, George Street, Richmond, and 75, Weston Hill, Upper Norwood, under the style of J. W. Winton and Co. Debts will be received and paid by J. W. Black.

* * * * *

Frederick William Kirkham and Henry Townsend Makepeace, carrying on business as surgeons at Downham Market under the style of Kirkham and Whitling. Debts will be received and paid by F. W. Kirkham.

Literary Intelligence.

Messrs. J. and A. Churchill will shortly publish a new edition of 'Bloxam's Chemistry, Inorganic and Organic,' re-written and revised by Prof. J. M. Thomson, of King's College, and Mr. A. G. Bloxam, Head of the Chemistry Department, Goldsmiths' Institute. Several new woodcuts have been introduced into this edition, and obsolete ones omitted. The same firm also announce a new and enlarged edition of Beasley's 'General Receipt Book,' comprising a veterinary formulary, recipes in patent and proprietary medicines, perfumery and photographic processes.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

FRIDAY, JUNE 7.

Royal Botanic Society.

"Romance of Plant-Life," by Dr. D. Morris.

SATURDAY, JUNE 8.

School of Pharmacy Students' Association.

Botanical Excursion to Kipping Forest, leaving Liverpool Street at 2.34 (Bloomsbury Square, 2.0 for Chingford).

Pharmaceutical Cricket Club v. Hadley Cricket Club (High Barnet). Leave King's Cross (Suburban) at 2 p.m.

MONDAY, JUNE 10.

Royal Institution of Great Britain, at 5 p.m.

General Monthly Meeting.

TUESDAY, JUNE 11.

Royal Colonial Institute, at 8 p.m.

Ordinary Meeting.

Royal Photographic Society.

Ordinary Meeting to be held at the new premises, No. 13, Hanover Square.

"The Recording of High Temperatures by Photographic Means," by Prof. W. C. Roberts-Austen, C.B., F.R.S.

"On Orthochromatics," by Capt. Abney.

THURSDAY, JUNE 13.

School of Pharmacy Students' Association, at 7 p.m.

"Report on Physics," by Mr. H. T. Durant.

FRIDAY, JUNE 14.

Royal Astronomical Society, at 8 p.m.

Ordinary Meeting.

SATURDAY, JUNE 15.

Geologists' Association (London).

Excursion to Tilburstowhill. Leave Cannon Street (S.E.R.) at 2.17 p.m. for Godstone.

Company Business.

BUTE DRUG STORES, LIMITED.—Registered on May 2 with a capital of £300, in £1 shares. Object: To carry on business as chemists, druggists, drug merchants, and store-keepers. The registered office is 30, Louisa Street, Docks, Cardiff.

* * * * *

WENGERS, LIMITED.—Registered on May 24 by Paddock and Sons, Hanley, Staffordshire, with a capital of £50,000, divided into 2000 £5 per cent. cumulative preference shares of £10 each, and 3000 ordinary shares of similar value. Objects: To acquire as a going concern the business, carried on by Albert F. Wenger at Parker Street, Hanley, Staffordshire, of a colour and chemical manufacturer and potters' merchant: to adopt and carry into effect an agreement for the purposes of such acquisition, and to carry on business as manufacturers of and dealers in chemicals, potters' colours and materials, potters' machinery, utensils and appliances, earthenware, china, glass, majolica, stoneware, etc.

* * * * *

INGRAM AND ROYLE, LIMITED.—Registered on May 24 by T. Allingham, 23, Bucklersbury, E.C. Capital, £32,500 in £10 shares. Objects: To carry on business as agents for the sale of natural and artificial aerated and mineral waters, as hitherto carried on by Ingram and Royle at London and Liverpool, and, with a view to the above object, to carry into effect a certain agreement.

Late Advertisement.

WANTED, a good Junior ASSISTANT (in-doors). Apply: ROBERT DONINGTON, Market Place, Spalding.

Pharmaceutical Journal

SUPPLEMENT

LONDON, JUNE 15, 1895.

Trade Notes.

MESSES. SOUTHALL BROTHERS AND BARCLAY have introduced an improvement on their well-known "sanitary towels," which consists in forming the pads of alternate layers of absorbent cotton-wool and gauze. The effect of this combination is to prevent contraction of the area of the discharge, and the improved towel is said to be more absorbent, more comfortable, and more cleanly than the ordinary pads. It is supplied at the low price of one penny.

* * * * *

MESSES. E. BING AND SON, Pharmaceutical Chemists, St. George's Street, Canterbury, have fitted up a photographic dark-room and stock dry-plates, etc.

* * * * *

MR. G. R. LAWRENCE, Pharmaceutical Chemist, High Street, Rhyl, also stocks photographic necessities, and allows customers the use of a dark-room free of cost.

* * * * *

MR. J. W. LITTLEFIELD, Pharmaceutical Chemist, High Street, Ventnor, Isle of Wight, supplies similar accommodation for wandering photographers.

* * * * *

MESSES. WM. WYATT AND CO., Pharmaceutical Chemists, Stonewell, Lancaster, have also joined the ranks of those who serve the worshippers of the sun, and help them to exclude his actinic rays on occasion.

Personal Notes.

DR. TIRARD, the recently appointed Secretary to the Pharmacopœia Committee of the General Medical Council, is Professor of Materia Medica and Therapeutics at King's College, and the author of the 'Prescriber's Pharmacopœia.'

* * * * *

MR. J. H. MAIDEN, who has been assisted by Mr. W. S. Campbell, has completed Part I. of 'The Flowering Plants and Ferns of New South Wales.' The work is issued under the authority of the Department of Mines and Agriculture for New South Wales.

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PROF. J. S. BURDON-SANDERSON has been elected an honorary fellow of Magdalen College, Oxford, where he formerly held a fellowship annexed to the Waynflete chair of physiology.

* * * * *

MR. ALEXANDER ELLIS, late of Skelton-in-Cleveland, will shortly commence business in Victoria Terrace, Westoe Road, South Shields, where he is having premises fitted by Messrs. Evans, Son, and Co., and the York Glass Company.

* * * * *

MR. A. BALI, who has been for the past eight years with Messrs. Burroughs, Wellcome, and Co., is now joining the firm of Oppenheimer, Son, and Co., Limited, as a managing director.

* * * * *

MR. JOHN H. SMITH, Pharmaceutical Chemist, of Newark-on-Trent, is honorary secretary to the local half-holiday association, and seems to have given general satisfaction by the arrangements he made in connection with the members' annual picnic on Thursday, June 6, when Belvoir Castle was visited.

* * * * *

MR. J. W. KNAPMAN, the worthy Librarian of the Pharmaceutical Society, is to be congratulated on the success of his son—Herbert Knapman, of the Grocers' Company's School, Hackney Downs—who has won a Local Examination Scholarship at Rugby.

MR. THOMAS JOHN F'ANSON BROMWICH, the Senior Wrangler, is an old Wolverhampton Grammar School boy. His father is in business as a chemist at Durban, South Africa.

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MR. ALEXANDER GUNN, chemist and druggist, will carry on the business of his father, the late William Gunn, of Duns.

Late News.

EDINBURGH CHEMISTS' ANNUAL EXCURSION.—The annual excursion of the Edinburgh District Chemists' Trade Association took place on Wednesday, 12th inst. The place selected for the day's outing was Kinross, celebrated for its historical associations as well as the beauty of its scenery. The company, which numbered about 100 ladies and gentlemen, left the Waverley Station in saloon carriages at a quarter past ten o'clock. At that time the weather looked slightly ominous, for although there was plenty of sunshine, watery-looking clouds gathered now and again and threatened rain. The journey to Perth through Glen Farg was accomplished in an hour and a quarter, and here the company was augmented by representatives of the trade from Perth, Dundee, Kirkcaldy and Dumfermline, and it may also be mentioned that Mr. Harland, of Messrs. Maw, Son and Thomson, London, was one of the excursionists. At Perth Station brakes were in readiness to convey the company by Bridge of Earn, and through Glen Farg to Kinross. The romantic character of the scenery along this route is well known, and it looked its best on Wednesday in its fresh green, luxuriant foliage. About half-way through the glen a halt was made, and the excursionists partook of refreshments in a wood near the roadside. At this time a sharp shower of rain fell, but it passed off quickly and inconvenienced no one. Kinross was reached about three o'clock, the drive, which was greatly enjoyed, having occupied about three hours. Dinner was served in the Green Hotel immediately after their arrival, after which a number of toasts were proposed. Mr. Peter Bos, President of the Association, occupied the chair, and on his right and left were Provost Beveridge (Kinross) and Mr. Chas. Kerr (Dundee), Vice-Chairman of the Scottish Executive of the Pharmaceutical Society. Mr. John Bowman was Vice-Chairman. After the loyal toasts had been duly honoured, Mr. Bowman proposed "The Navy, Army and Reserve Forces," to which Mr. Lawlor (Milnathort) replied. Mr. Kerr gave "Success to the Annual Picnic," and the Chairman acknowledged. The Chairman submitted the toast "The Burgh of Kinross," coupled with the name of Provost Beveridge, who replied, and Mr. J. R. Hill gave "The Visitors and Ladies," which Mr. Thos. Gibson acknowledged. Both before and after tea the company had a little time to look around them, and as the weather was by this time quite settled the opportunity was fully taken advantage of. Those who expected to enjoy a row on Loch Leven and to have the opportunity of landing on the island, on which stands the castle where Queen Mary was imprisoned, met with a disappointment. The day had been fixed for the national angling competition on the loch, and, as a result, everything in the shape of a boat had been previously engaged. There was plenty of scope for enjoyment round the loch, in the grounds of the hotel, and in Kinross House and grounds, one of the seats of Sir Graham Graham Montgomery, which were open to the members of the Association and their friends. Eight o'clock, the hour of departure on the return journey, came all too soon. In little more than an hour after the excursionists were all set down again at Waverley Station, and after many hand-shakings they parted all well satisfied with the day's outing.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, JUNE 13, 1895.

There have been no movements of especial interest in the chemical market since our last report, and business generally is very quiet. Carbolic acid is easier all round, and both citric acid and cream of tartar are dull of sale at fractional reductions. Full details will be found below of the various articles of interest:—

ACID, CARBOLIC.—A dull market, and quotations are lower all round. The current prices are as follow:—*Crystals*: 84° to 85° C., 5½d. per lb.; 39° to 40° C., 6½d. per lb.; 39° to 40° C. (*detached Crystals*), 7½d. per lb.; these prices are for bulk quantities in 3 cwt. drums. *Crude*: 60 per cent., 1s. 6½d.; 75 per cent., 1s. 9½d. *Liquid*: 1s. 0½d. per gallon for 95 per cent. *Cresylic*: 11½d. per gallon.

ACID, CITRIC.—Dull of sale. Makers maintain their prices at 1s. 1½d. to 1s. 2d., in second hand it can be bought at 1s. 1½d. to 1s. 1¾d.

ACID, OXALIC.—Manufacturers' prices are unaltered, and it is in steady demand at 3½d. net., *ex rails*.

ACID, TARTARIC.—A firm market. *English* brands of acid especially are very steady at a fractional advance, and 11½d. to 11¾d. is now asked; *foreign* makers still quote both *powder* and *crystal* at 11d.

AMMONIA SALTS.—*Carbonate*, steady at 3½d. to 3¾d., *Liquor*, unaltered at 3d. to 3½d.; *Sal ammoniac*, *First* quality is still returned at 89s., with *seconds* at 37s. *Sulphate*: A weak market, after fluctuating during the week between £9 15s. and £10, at the close £9 15s. is the quotation for grey 24 per cent.

ASHES—Unaltered. *American* are worth 40s. and *pots* 38s.

ARSENIC—Remains very steady and in poor supply. The price for best white powder is unchanged from 15s. 3d. to 15s. 6d.

BLEACHING POWDER—Steady. The spot price is £7 to £7 10s., whilst in Liverpool it is quoted at £7 10s. to £7 15s. *f.o.b.*

BORAX.—There is no improvement in the price, and in second hands *powder* and *crystals* are offered at 19s. 6d. and 18s. 6d., respectively. The *Syndicate* prices are maintained at 21s. and 20s.

COAL-DISTILLATION PRODUCTS.—*Benzole*: 50 per cent. is steadier, being now worth 11½d. per gallon, but 90 per cent. is unchanged at 1s. per gallon. *Pitch* is a trifle firmer, being quoted at 37s. per ton, *f.o.b.*, whilst *Tar* is lower, the price per barrel of 40 gallons being now 10s. 6d.

COPPER SULPHATE.—A firm market at last week's steady rates. It is still quoted at £15 to £15 15s., according to brand.

CREAM OF TARTAR—Dull of sale, and again lower prices have been paid. Best white French *crystals* are now worth 68s. whilst German makers of *powder* realise 70s. to 71s.

MERCURIALS.—The quotations are unaltered from those of last week. The current prices are: *Calomet*, 2s. 11d.; *corrosive sublimate*, 2s. 7d.; *red precipitate*, 3s. 2d.; *white ditto*, 3s. 2d.; *blue pill*, 1s. 8d.; *ditto, ointment*, 1s. 8d.

POTASH SALTS.—*Bichromate*: Unchanged at 4½d. to 4¾d. *Chlorate*: Very steady. On the spot it is worth 5d., whilst in Liverpool it has been selling freely at 5d. to 5½d. *Perrnanganate*: Firmer. Small *crystals* are worth 58s. 6d. to 54s. *Prussiate*: Dull of sale at 8½d. to 8¾d. In Liverpool also it is dull of sale at 8d.

QUICKSILVER—Steady. Importers' prices are maintained at £7 10s., whilst in second hands it can be bought for £7 8s. to £7 8s. 6d.

SALT-PETRE—Steady. British refined is still worth 22s. 6d. to 23s. 6d. on the spot, and in Liverpool it is quoted at 23s. 6d. in kegs, and 23s. in barrels.

SODA COMPOUNDS.—*Bicarbonate*: £7 5s. in London, £6 15s. in Liverpool. *Caustic* 70 per cent. £3, with 60 per cent. £1 less. *Crystals*, 58s. *Hyposulphite*: Dearer, and held from £6 15s. to £7 per ton in Liverpool.

THE DRUG MARKET.

THURSDAY, JUNE 13, 1895.

At the drug sales to-day beeswax was in large supply and met with a very brisk demand. Jamaica honey also sold freely at steady rates. Tinnivelly senna was dearer. Cardamoms were steady, but seed was a trifle easier. Ho ipeacacantha met with a fair demand at fully to somewhat firmer rates. Full details will be found below:—

ACACIA.—A moderate supply only was offered to-day, and this was all bought in. Fine medium pale, picked gum being held at £11; small pale gum at £5 15s. to £6 10s.; medium yellowish sorts at 80s., and ordinary small sorts at 85s.

ALOES.—*Cape*: Thirteen cases only were offered to-day. Of these one case of fair hard seconds sold at 2s. The rest was bought in. *Socotrine*: Sixty-one kegs were offered; these were all bought in at the rates of 65s. to 75s. for fair to good soft brown. *Curacao*: A few bars of ordinary capey sold at 18s., but a parcel of sixty gourd were all bought in at 30s. for fair, part capey and drossy. *East Indian* (in tins): Ten cases of medium softish, fair aroma, sold at 33s., the remainder was bought in.

AMBERGRIS.—Five packages were offered. Of these 1 tin of greyish lump sold at 41s., another of yellowish lump of fair aroma at 65s., and a tin of inferior quality at 15s.

AMMONIACUM.—Seven packages only were offered to-day. These were bought in from 30s. to 35s. for part blocky seedy gum.

ANISE (STAR).—Japan was bought in at 30s., but 11 cases of fair China sold at 65s.

ANATTO SEEDS.—No enquiries. Good bright red *Madras* seed was bought in at 5d.

ARAPOBA.—Ten cases from Hamburg were offered, but no bid being forthcoming, were bought in at 2s. 2d.

ARAFETIDA.—726 cases were offered, but the only lot sold was a parcel of 18 cases which fetched 49s. for fair pinkish almondy block, part softish.

BENZON.—*Siam*. Seven cases only were offered. These were all bought in at the rates of £16 10s. for bold pale and dark loose almonds, and £10 10s. for mixed blocky and almondy seconds. Of the *Sumatra* gum, medium almondy seconds slightly false packed sold at £7 15s., and medium ditto, with false packed sides, £7 5s., and dull small almonds, false packed, at £6 7s. 6d.

BUCHU LONG.—Of 40 packages offered to-day, good round green leaves sold freely at 3½d. to 3¾d.; very ordinary ditto, 1½d. to 2d.; *Long* leaves were bought in at 6d.

CAFFEINE.—The position remains unaltered. Small sales have been made in second hands at 25s. per lb., whilst for August delivery it can be bought at 18s. to 19s.

CALUMBA ROOT.—Fair to good yellow root of bright colour was bought in at 21s. to 30s., according to quality.

CAMPHOR (CRUDE).—Remains in good demand at steady rates. For arrival, May to July shipment, both *China* and *Japan* have been selling at 165s. On the spot 17s. has been the price during the week, but little business has been done, owing to the high prices asked. To-day a large amount was offered. This was all bought in, *Japan* at 165s., and *China* at 160s.

CAMPHOR (REFINED).—The quotations of the British and foreign refiners are unaltered as yet, the current quotation for 10 cwt. lots being 1s. 9½d. for *bells* and *flowers*, with *squares* at 1s. 10½d., and proportionate rates. To-day *German* refined was bought in at the sales at 1s. 8½d., a bid of 1s. 8d. being refused.

CANADA BALSAM.—Three casks of clear balsam were bought in at 1s. 6d., the limit being 1s. 4d.

CANNABIS INDICA.—None was sold to-day. Streaky brownish, seedy tops, were bought in at 3d. to 4d. A case of clean tops in bundles packed in tins were bought in at 9d.

CARDAMOMS.—In good supply and selling at steady rates. The prices realised were as follows:—*Ceylon Mysore*, medium to bold pale, 2s. 2d. to 2s. 7d.; small to medium pale, 1s. 5d. to 2s.; small to medium yellow, 1s. 2d. to 1s. 4d.; damaged, 6d. to 1s. 3d., according to condition. Seed was hardly so firm, and sold at 1s. 9d. to 1s. 10d.

CASCARILLA.—A parcel of 90 bales of small silvery bark sold freely at 24s. 6d. to 41s. according to quality. *Siftings* were bought in at 30s.

CASSIA FISTULA.—Forty-one bags of bold pod were bought in at 25s., the limit being 20s.

CINCHONA.—*Crown* bark was bought in at 9d.; *Yellow* bark sold freely at 11d. to 1s. 5d. for good qualities, down to 5d. for second class damaged, and 2d. for third ditto. *Carthagena* bark was bought in at 1s.

CLOVES.—The market for delivery is very active, and a large amount of business has been done in *Zanzibar* at steady rates, the prices being $3\frac{1}{2}$ to $3\frac{3}{4}$ for June to August, and July to September delivery. At the sales on the 13th inst. *Zanzibar* was all bought in. *Penang* was dull of sale, a few cases only of fair picked, selling at 6d. *Ceylon* sold at 4½d. for dark qualities.

COCA.—Seventeen bales of fair broken *Truxillo* leaves of good colour were bought in at 11d. to 1s., according to quality.

COCAINE.—The reduction in the Convention price noted last week was quickly followed by another drop of 9d. per oz., in order to "knock out" the outside makers, and the current quotations for *Hydrochlorate* are now as follows:—For 100 ozs., 13s. 9d.; from 25 to 100 ozs., 14s.; and for lots under 25 ozs., 14s. 3d. These rates are for cocaine in tins, 1 oz. bottles being charged 8d. per oz. more.

COCO BUTTER.—At the sales on the 11th inst. 60 tons of *Cadbury's* make sold at 1½d. to 1½d., the average being 1½d., against 1½d. at the last sales.

COCULUS INDICA.—A parcel of ninety bags sold freely at 8s.

CODEINE.—The present position of *morphine* has not affected this alkaloid, and quotations remain unchanged at 10s. 3d. to 10s. 9d., according to quantity and brand.

INSECT FLOWERS.—Although no further advance in price has occurred as yet, the demand in the Trieste market is brisk, and a further rise is not unlikely. Present prices are: Open flowers, 50s.; half-closed ditto, 78s.; closed ditto, 105s. (London).

COLOCYNTH.—Seven cases only were offered. These were broken *Spanish* apple, and were bought in at 1s. 2d. to 1s. 3d.

COPAIBA.—Dull of sale. Dark bright *Para* balsam was bought in at 1s. 7d., and bright and cloudy *Maranham* at 1s. 10d.

CORIANDER SEED.—Fair *Bombay* seed was held for 8s.

CUBEBS.—Absolutely no enquiries. Fair to good brown *Singapore* and *Bombay* berries were bought in at 45s. to 55s.

CUTTLEFISH.—Eighty casks fair quality sold at 1½d. to 1½d.

DILL SEED.—Five bags fair seed sold at 11s. 6d.

DRAGONS BLOOD.—None was sold to-day. Fair lump seedy gum was bought at £6 10s.; good bright ditto somewhat seedy, at £8 to £9 10s., and dark slab in reed at £7 5s. dark saucers at £6 10s.

ELMI GUM.—Somewhat easier. Subject to approval of holder, fairly clean pale gum sold at 25s. to 26s.

HONEY.—A parcel of *Jamaica* sold very freely at 20s. to 24s. 6d. for ordinary to fine, and from 25s. to 34s. for medium to fine bright clean "apiary" honey. *Smyrna*: Six casks sold without reserve at 11s. 6d. *Australian* and *Pisco* honey was all bought in.

INSECT POWDER.—Trieste ground powders are quoted as follows: Extra fine half-closed, 100s.; extra fine cultivated flowers, 76s.; ordinary, 68s. per cwt. c.i.f.

IPPECACUANHA.—*Brasilia* root was very firm to a trifle higher. The prices realised were: Ordinary bold, 4s. 3d. to 4s. 4d.; medium qualities, 4s. to 4s. 2d. One bale of *Carthagena* only sold, the remainder being held for advanced rates.

JABORANDI.—A parcel of good pale green leaves was bought in at 8d.

JALAP.—Seven bales only were offered, of these two sold at 10½d., subject to approval of the buyer; the remainder were held for 11d.

MENTHOL.—Quiet. The spot price is 14s. 6d., and for delivery 13s. 9d. to 14s. c.i.f. To-day two cases of dry crystals of fair colour sold without reserve at 12s. 3d. The remainder was bought in at 14s. to 17s.

MORPHINE.—The position is unchanged. *Hydrochlorate* is quoted at 4s. per oz. in 1000 oz. lots, with smaller wholesale quantities at 4s. 3d.; *crystals*, 2d. per oz. more. In view of the firmness of Turkey opium, the position of morphine may be expected to improve.

MUSK.—Five tins *Tonquin* sold to-day at 62s. 6d. to 63s. for bold, thin grey skin. *Grain* was bought in at 50s.

MYRRH GUM.—Remains very dull of sale and the only lot disposed of to-day was 2 cases of pickings which sold at 25s.

NIX VOMICA.—In improved demand. Fair *Colombo* seed sold at 5s., and bold ditto, better quality at 8s.

OIL (COD-LIVER).—Unaltered, but few inquiries. Holders ask 170s. per barrel of 25 gallons for non-congealing 1895 oil.

OILS (ESSENTIAL).—*Star Anise* remains quiet at 6s. 3d. on the spot. *Cajeput* bought in at 2s. 9d. *Cassia*: Dull of sale at 4s. 9d. to 5s. for oil showing 80 to 85 per cent. of cinnamon aldehyde. *Cinnamon leaf* sold at 1½d. to 1½d. per oz. *Citronella*: Very firm, the spot price for oil in tins being 1s. 4d. *Lemon*: One case sold at 4s. *Lemon Grass*: Dull of sale at 1½d. *Lime Essence*: One case sold at 1s. 8½d. per lb. *Nutmeg*: Bought in at 3d. to 5d. per oz. *Otto of Limes*: Sold to-day at 4s. 6d. per lb. *Peppermint*: *Dementholised* was bought in at 6s. 6d.; 40 per cent. at 8s. 6d., and *Cocking's* oil at 6s. 9d. *Patchouli*: Bought in at 1s. 1d. *Spearmint*; *H. G. Hotchkiss's* oil was bought in at 11d.

OILS (FIXED) AND SPIRITS.—*Castor*: Very firm at a fractional advance. *Italian* oil is quoted at 31s. c.i.f. *Cocconut*: Steady. *Ceylon* is quoted at £22 15s. *Cochin*, at £24 10s. to £24 15s., and *Mauritius* at £23 nominally, on the spot. *Cotton*: Firm. Refined oil is worth £18 to £18 5d. according to make and package. *Linseed*: Very firm at an advance. In barrels on the spot it is quoted at £21 10s. *Rape*: Firm. Refined oil is worth £22 15s. to £23s. on the spot. *Turpentine*: Lower. On the spot *American* spirit is now worth 22s. 4½d. to 22s. 6d. *Petroleum* easier. *American* oil is quoted at 5½d. to 5½d. *Water white*, 6½d. to 7d. *Russian*, 5½d. to 5½d. *Petroleum spirit, ordinary*, 8½d. to 8½d. *Deodorised*, 8½d. to 9d.

OREIS ROOT.—*Florentine* root is quoted at 78s. per cwt. for good sorts, with best selected at 77s. c.i.f.

QUININE SULPHATE.—Remains quiet but steady. There have been no sales of importance, business being confined to a few small lots of B. & S. and H. B. on the spot at 1s. 0½d. To-day 500 ozs. of *Howard's* quinine were bought in at 1s. 8d., the limit being 1s. 4d.

RHUBARB.—Largely offered to day, but met with no demand. A few cases of *Canton* sold, 9½d. to 1s. being paid for medium rough round root half-dark fracture. Four cases of fair medium *Shensi* with pinky fracture sold at 1s. 3d.

OPIMUM.—*Turkey* is much firmer, the following being the current quotations:—*Soft shipping* descriptions, best qualities, 11s. 6d. to 11s. 9d.; *seconds ditto*, 11s. 3d. to 11s. 6d.; *best druggists*, 9s. to 9s. 6d.; *seconds ditto*, 8s. to 9s.; *Persian*: The market is cleared out of first-hand parcels, and fine qualities are worth 12s. 6d. to 12s. 9d. Although stocks are small, the reports of the new crop are favourable, and unless prices advance in China, the market will probably be quiet until the advent of the new crop.

SENNA.—*Tinnivelly* leaves are in fair demand at fully steady rates. Good green medium to bold sold at 4½d. to 6½d., 2d. for medium yellowish, and 1½d. to 1½d. for ordinary dark. *Pods* were bought in at 2d. *Alexandria* leaves were all bought in at rates ranging from 6d. to 1s. 7d.

WAX (BEES).—In large supply to-day and met with a brisk sale at fully steady rates. *Madagascar* sold at £6 17s. 6d. to £7 2s. 6d.; *Jamaica* £7 15s. to £8 10s.; *Australian* £7 5s. to £7 15s.

Exchange.

[Notices of books, apparatus, etc., for exchange, of reasonable length, are inserted free in this column, if they do not partake of the nature of ordinary advertisements. The notices should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C."]

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1896.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

INDIA-RUBBER URINAL (male) for day and night use.—Judge, Chemist, Bourne, Lincs.

OFFERED.

LANCASTER'S MULTUM-IN-PARVO ENLARGING CAMERA, 12 by 10, condition as new, and small sum; in exchange for 4-plate instantograph, complete.—Walker, Grange Mount, Birkenhead.

LAURANCE'S SPECTACLES, stock of; new; all sizes. What price?—W. G. McNab, Chemist, Gorebridge, Midlothian.

LABORATORY FITTINGS, including over 100 bottles containing all ordinary metallic salts, and about five dozen reagent bottles. For sale at any reasonable offer. Full details from Simpson, Stonebridge Park, Willesden.

PRITCHARD'S HORSE AND CATTLE PANACEA OR EMBROCATION.—8 2s. size, 5s.; 26 1s. do., 10s. 6d.; 17 1s. Pritchard's Household Panacea or Embrocation, 7s.; 5 2s. 9d. Holloway's Ointment, 1s. 3d. each; 1 Godfrey's Extract, 1s. 6d.—Cocker, Chemist, Luton, Beds.

BELL-SHAPED MILITARY TENT, 40 feet circumference complete, with pole mallet, etc. Cost £5, in perfect condition. Price, 25s. cash, with order.—W. H. Aukland, Chemist, 46, Camden Road, London, N.W.

STEAM JACKETED PAN, holds 110 gallons. Jacket and pan all copper tinned inside, on strong wrought-iron stand, good as new, £30.—Moss, Chemist, Ilkeston.

BOOKS.—Roscoe's 'Chemistry,' 1892 edition, quite new, 3s.; Woodland's 'Materia Medica,' 1s. Offers.—Symonds, 280, Fulham Road, S.W.

Cricket News.

MUTER'S *versus* COOPER'S.—This return match was played at the Paddington Recreation Ground on Saturday, June 8, and resulted in a victory for the former, the scores being S.L. School of Pharmacy 180, and Central School of Pharmacy 36. Mr. Harris scored 41 not out, and Mr. Plumstead 56 for the victors.

New Books and New Editions.

[Publishers are invited to forward full particulars of new publications, including prices.]

THE THEORY OF LIGHT. By T. PRESTON. Second edition. 8vo, pp. 578. Price 15s. net. (Macmillan and Co., London.)

INDEXES TO THE LITERATURES OF CERIUM AND LANTHANUM. By W. H. MAGEE. (Smithsonian Miscellaneous Collections, No. 971.) 8vo, pp. 43. Price 2s. 6d. (William Weesley and Son, London.)

HYDRODYNAMICS. By H. LAMB. A second edition of the author's 'Treatise on the Mathematical Theory of the Motion of Fluids.' 8vo, pp. 610. Price 20s. net. (Cambridge Warehouse, Cambridge.)

ACROSS THE COMMON AFTER WILD FLOWERS. By M. C. COOKE. Cr. 8vo, pp. 98. Price 1s. 6d. Boards, 1s. (Nelson, London.)

A STROLL ON A MARSH IN SEARCH OF WILD FLOWERS. By M. C. COOKE. Cr. 8vo, pp. 94. Price 1s. 6d. Boards, 1s. (Nelson, London.)

THE FIRST BOOK OF ELECTRICITY AND MAGNETISM. By W. P. MAYCOCK. 2nd edit., thoroughly revised, corrected, and greatly enlarged, post 8vo, pp. 230. Price 2s. 6d. (Whittaker and Co., London.)

Diary of the Week.

SATURDAY, JUNE 15.

Pharmaceutical Cricket Club v. Burgoyne, Burbridge and Co. (Willesden). Train leaves Euston at 2.15 p.m.

MONDAY, JUNE 17.

Royal Geographical Society, at 8.30 p.m.

"Armenia," by H. F. B. Lynch.

WEDNESDAY, JUNE 19.

Western Chemists' Association (London), at 9 p.m.

Adjourned Discussion on the Present Phase of the Poisons Law.

University College (London) Chemical and Physical Society, at 5 p.m.

Ordinary Meeting.

Geological Society of London, at 8 p.m.

Evening Meeting.

Edinburgh Chemists', Assistants', and Apprentices' Association, at 8.30 p.m.

Summer Meeting at 36, York Place, Edinburgh.

Society of Arts, at 9 p.m.

Conversations at South Kensington Museum.

Geological Society of London.

"On the Occurrence of Radiolaria in Chalk," by William Hill, and A. J. Jukes-Browne.

"The Crush-Conglomerate of the Isle of Man," by G. W. Lamplugh.

"The Chalky Clay of the Fenland and its borders: its Constitution, Origin, and Distribution," by Sir Henry H. Howorth.

"On the Occurrence of *Spirorbis*-limestone and thin Coals in the so-called Permian Rocks of Wyre Forest; with Considerations on the Systematic Position of the Permians of Salopian Type," by T. Crosbie Cantrill.

THURSDAY, JUNE 20.

Linnean Society of London, at 8 p.m.

"On some North American Desmidiaceae," by William G. S. West.

"On the Structure of the Isopod Genus *Ourozetes*, Milne, Edw.," by A. Vaughan Jennings.

"A Revision of the Genus *Silene*," by F. N. Williams.

"The Egg-Cases of Port Jackson Sharks," by E. R. Waite.

Chemical Society, at 8 p.m.

Extraordinary General Meeting to consider change in Bye-law I., proposed by the Council. Ballot for the Election of Fellows.

"On Lintner's Isomaltose," by Horace T. Brown, and G. H. Morris.

"Transformation of Ammonium Cyanate into Urea," by Professor Walker and J. F. Hamley.

"Some Derivatives of Humulene," by A. C. Chapman.

"Note on Thio-Derivatives of Sulphanilic Acid," by Miss Walter.

"The Chlorination of Ortho-chloro-toluene," by W. P. Wynne and A. Greaves.

"The Six Dichloro-toluenes," by W. P. Wynne and A. Greaves.

"The Disulphonic Acids of Toluene and of Ortho- and Para-chloro-toluene," by W. P. Wynne and J. Bruce.

"Etheral Salts of Ethane tetracarboxylic Acid," by Professor Walker and J. R. Appleyard.

"A Method for Preparing Formyl Derivatives of Aromatic Amines," by H. R. Hirst and J. B. Cohen.

"A Modification of Zincke's Reaction," by H. R. Hirst and J. B. Cohen.

"A New Method of Preparing Cyanuric Acid," by W. H. Archdison and J. B. Cohen.

FRIDAY, JUNE 21.

Pharmaceutical Society of Great Britain (North British Branch), at 12 noon.

Meeting of Members and Associates in Business.

Address by the Chairman.

Result of Election of Executive.

SATURDAY, JUNE 23.

Geologists' Association (London).

Excursion to Totterhoe. Leave King's Cross (G.N.R.) at 1.35 p.m. for Dunstable (L.N.W. Station).

Pharmaceutical Journal

SUPPLEMENT

LONDON, JUNE 22, 1895.

Pharmaceutical Journal.

FIFTY-FOURTH YEAR OF PUBLICATION.

A Weekly Record of Pharmacy and Allied Sciences.

The oldest Journal addressing Pharmacists.

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In addition to being the sole periodical publishing full and complete reports of the transactions of the Pharmaceutical Society and of the British Pharmaceutical Conference, the JOURNAL records the proceedings of pharmaceutical and other scientific societies throughout the country, and chronicles all important advances in pharmacy and allied subjects in this country and abroad. Reviews of new scientific and technical works form an important feature in the JOURNAL, and its pages are also open for the discussion of matters of importance to British pharmacists generally, as well as for the purpose of supplying special information desired by subscribers.

The JOURNAL is supplied from the Publishing Office, 5, Serle St., Lincoln's Inn, W.C., post free for twelve months to any address throughout the world, on receipt of remittance for Ten Shillings and Sixpence.

Photography for Chemists.

THE LENS.

Of all subjects the lens is about the most misunderstood of any in connection with photography. In the first place most of the text-books are too advanced or too superficial.

There are three types of lenses, the single achromatic or landscape lens, the doublet or rapid rectilinear, and the portrait lens, this last being but rarely used by amateurs at least. The doublet or rapid rectilinear is the most useful all-round lens, and should always be recommended in preference to the single lens. There are two species of the rectilinear, and considerable confusion exists not only in the minds of users but of sellers also sometimes, and this has been fostered by the makers giving all sorts of absurd names to practically the same lens. A doublet when of short focus relatively to the diagonal of the plate on which it is to be used is called a wide angle, or portable symmetrical lens, and it is a common idea that a wide angle lens always includes a wide angle, but it does so only when it is used on a

fairly large plate, and it is an indisputable axiom that lenses of the same focus always include the same angle on the same sized plate, no matter what they are called.

The distance from the lens to the ground glass when a distant object is focussed is always called the equivalent focus or the focal length of the lens, and as this is an important factor to determine we should know how to do it. Screw the lens on to the camera front and against the wall pin a foot rule or inch tape, now arrange the camera so that the image formed by the lens fills a definite space. For instance, supposing we take 12 inches of the inch tape, their image should occupy just 4 inches; by a little shifting of the camera and racking the lens in and out this will be easily done. Now without disturbing the camera at all, measure the distance between the ground glass and the foot rule, and multiply this distance by the amount of reduction; in the case in point this is 3. Then divide the result by the number expressing the times of reduction *plus* one squared. For example, with a given lens we find the distance between foot rule and ground glass to be 12 inches, then $12 \times 3 = 36$ $36 \div (3 + 1)^2 = 2\frac{1}{4}$, which is the equivalent focus of the lens.

It is very frequent to find that dealers or manufacturers call their lenses "rapid" or "extra rapid," and by this term they mean that the lens transmits more light than others, but the amount of light transmitted is solely dependent upon the size of the lens in relation to its focus, or, as it is technically called, the ratio aperture of the lens, and this is determined by the diameter of the lens or diaphragm, or, as this last is sometimes called, the stop; and the ratio aperture, or, as it is generally written, Fx value, is determined by dividing the equivalent focus by the diameter of the stops. If we have a lens which, by the above method, is found to have a focus of 8 inches, and the largest stop has a diameter of aperture of 1 inch, we get $8 \div 1 = F/8$, and if the second size stop has a $\frac{1}{2}$ -inch diameter, it will obviously be $F/16$, a $\frac{1}{4}$ -inch stop will, of course, be $F/32$, a $\frac{1}{8}$ -inch $F/64$, and so on.

The following rule is absolute and cannot be explained away by any specious advertisement, so that, as many amateurs know it, it is just as well to be careful when speaking of lenses, to bear in mind that all lenses working at the same ratio aperture are of absolutely the same rapidity, whether single, doublets, or portrait lenses. This does not seem such an easy matter to understand, because if you take a 4-inch lens, the $F/8$ stop is much smaller than the same ratio aperture of a 16-inch lens, as a matter of fact it will be just one-fourth the size. The explanation is as follows, and as dealers are frequently called upon to explain these points, it may be useful:—Only a given amount of light can pass through a given sized hole, and as all the light that reaches the plate has to pass through the stop, we may for the time being consider it as the source of light. It is an accepted axiom, and easy to be demonstrated, that the intensity of the light decreases as the square of the distance.

Now, as the amount of light passing through two holes is equal to the area of the holes, or, what is the same thing, to their diameter, it is obvious that if we have a certain amount of light passing through

a hole of one-inch diameter, and falling on a screen eight inches distant, precisely the same intensity of light will fall on a screen 4 inches distant from a $\frac{1}{2}$ -inch hole. This can of course be carried on to greater distances and greater diameters.

Now there is one point about the diaphragm or ratio apertures which should be known by all photographers, but it is not, and one or two dealers are known to have been unconsciously taken in by their customers on this point. When the light strikes the front lens of the doublet it is condensed or made convergent, and therefore more light will really pass through a given sized stop; consequently a good optician makes allowance for this, and really gives the diaphragms their true ratio value, which is actually less than the equivalent focus divided by their diameter number. For instance, if we have a doublet lens, the front glass of which is 2 inches in diameter and the distance between the two lenses is 2 inches, the diaphragm will probably be just 1 inch behind the front lens. Supposing this lens to have a focus of 16 inches, a diaphragm may be marked F/16, and from what has been previously said, it might be supposed that the diameter of this should be exactly 1 inch; whereas, to get the true ratio value it would be probably $7/8$ ths of an inch, and this also applies to the larger and smaller sizes. Now if an ardent amateur buys a lens so marked and sets about determining the ratio value of his stops, and finds them marked, as he thinks, wrongly, he will probably return the lens with a somewhat curt note to the dealer asking for an explanation, and if this is not forthcoming, a customer may be lost, so that this should always be looked out for. If such a case does arise and the dealer can satisfy his customer that the lens is right, but that the purchaser is wrong, the probabilities are that a far greater respect will be entertained by the said customer.

To test the true ratio aperture of any stop, an easy method is to take a piece of black cardboard large enough to entirely fill the back of the camera when the focussing screen is removed; in the centre should be punched a good-sized pinhole. The lens should be screwed on to the camera and the latter racked out to the equivalent focus of the lens, and the whole taken into a darkened room. The card should now be inserted in place of the focussing screen, and a lamp or lighted candle be placed outside the pinhole in the card, and on examining the lens, the front of it will be seen to be illuminated by a circle of light which can sometimes be more readily seen by just dusting the lens with a little French chalk. The diameter of this circle is the true effective or working aperture of the diaphragm.

The first thing an amateur does when he buys a new lens is to screw it on to his camera front, set up his camera and examine the ground glass, and possibly take a negative, generally with the full aperture, the result being that he finds that, supposing he has photographed a wall of his room or a row of houses opposite his window, only the centre is sharp, the sides being quite fuzzy or indistinct. Generally a complaint will be made about this, but there are no lenses made except some of the most recent German lenses which will cover the plate for which they are advertised perfectly sharp with full aperture; it being generally necessary to stop the lens down or insert the diaphragms till about F/16 is used before really satisfactory definition is obtained. Nothing can be done in such cases except to reason quietly, and point out that it is an inherent fault, which can only be got over by one of the new German lenses, such as Zeiss, Goerz, or Voigtlander, which cost from twice to two-and-a-half times the price of the English lenses.

Depth of focus is another bugbear—every amateur wants a lens which works at a very big aperture, and yet possesses great depth of focus, and the two things

are absolutely antagonistic. Depth of focus may be defined as the power to define upon a flat surface objects situated at varying distances from the camera. Now, theoretically, only one plane can be sharply defined at once, but owing to the reduction in size of objects and the inability of the eye to distinguish between very minute distances a lens seems to be able to depict several planes sharply, and this power increases inversely to the reduction of ratio aperture and focus, or, to put it in plain language, the shorter the focus of the lens and the more it is stopped down the greater the depth of focus it possesses, and *vice versa*.

Of course amateurs like to see specimens of work produced by a lens which they are recommended to buy, and to make such specimens a little cuteness, whilst perfectly legitimate, may go far towards deciding the question of purchase. In making such specimens never choose a flat object like a row of houses, a sheet of printed type, or the wall of a room, but choose a simple landscape subject where the objects at the side of the focussing screen are somewhat nearer to the camera than the centre, and do not focus exactly at the centre, but at a point midway between the centre and the margin. A far better result as regards definition will be thus obtained with any given aperture.

The question as to the particular focus for any given sized plate is merely a matter of choice, but for a quarter plate about 5 or 6 inches is usual for normal work, and from $2\frac{1}{2}$ to 3 inches for wide angle work, for half plate from $8\frac{1}{2}$ to 10 inches is usual, and 4 to 5 inches for wide angle; for whole plate, 11 to 13 inches, and $5\frac{1}{2}$ to $7\frac{1}{2}$ for wide angle work.

It is important to remember that all lenses of the same focus give absolutely identical sized images from the same standpoint.

We have in England several well-known opticians who advertise in photographic journals, and from whom their lenses can be obtained wholesale when asked for, but a chemist may frequently wish to sell cheaper lenses, and these are usually French lenses, and can be obtained from Clement and Gilmer, Basde Malte, Paris, or Levi and Co., at prices ranging from a few shillings to as many pounds.

To give some idea of how cheap landscape lenses can be obtained, I may state that the glasses themselves, unmounted in cells or tubes, can be obtained from about 1s. apiece for half-plates.

Choice of Photographic Apparatus.

BY FOTO-FILE.

To the chemist who is desirous of taking up photography, and to the customer also, size of apparatus is an important consideration. The principal sizes are:—

$3\frac{1}{4}$ by $3\frac{1}{4}$ inches	Lantern-plate size.
* $4\frac{1}{4}$ " $3\frac{1}{4}$ "	Quarter-plate size.
5 " 4 "	
$6\frac{1}{4}$ " $3\frac{1}{4}$ "	A stereoscopic size.
$6\frac{1}{2}$ " $4\frac{1}{4}$ "	" " "
* $6\frac{1}{2}$ " $4\frac{1}{2}$ "	Half plate.
7 " 5 "	
$7\frac{1}{2}$ " 5 "	
* $8\frac{1}{2}$ " $6\frac{1}{2}$ "	Whole plate.
10 " 8 "	
15 " 12 "	

Those marked with an asterisk are the usual and most common sizes, and the dimensions given above are the actual sizes of the plates used; the camera, of course, will measure a little more. I do not recommend any size not marked with an asterisk, except under exceptional circumstances. The 5 by 4 is an awkward

size, the only thing in its favour being that you can sometimes from a 5 by 4 negative obtain a lantern slide by contact printing, whereas from the quarter plate you sometimes have to sacrifice a little. About the stereoscopic sizes I shall have something to say presently. The half plate is a very popular size, possibly vying with the humble quarter plate in general use. The 7 by 5 we may at once dismiss by saying it is rarely but ever used; the $7\frac{1}{2}$ by 5 is that which is said to be the most artistic, that is, the ratio of the two dimensions are the most artistic, but this is somewhat absurd, because any print can be cut to the same proportion, 1:1 $\frac{1}{2}$, no matter what plate it was taken on. The whole plate is my favourite size, there is plenty of room on the plate, it will give prints that allow plenty of margin for lopping down, and when used entire it presents a reasonable sized picture; above this, well, we may leave it to the millionaire who can afford a "gillie" to carry his apparatus, and who has a long purse to stand the expense, for it must not be lost sight of that with the larger sizes expense increases not only in the apparatus but also in every plate and piece of paper used.

I have no less than six cameras, two quarter plates, a half plate, a whole plate, a 15 by 12, and a 24 by 18. I need hardly say that the two latter have been reposing in their cases undisturbed for many months, for as I get older I get lazier or else less capable of dragging about such heavy weights. The question of weight is an important one. For ladies practically a half plate (usually written $\frac{1}{2}$ pl.) is the largest size they can stand, generally a quarter plate ($\frac{1}{4}$ pl.) will by them be found enough. To the tourist who makes use of his own legs and not a cycle, a quarter plate is big enough for a day's tramp; for, speaking from personal experience, even the humble quarter plate becomes at the end of a day's tramp of sixteen or twenty miles a confounded nuisance and weight. But as I sometimes carry a whole plate ($\frac{1}{2}$ pl.) on a tramp of twelve miles I ought not to grumble. A friend of mine, who frequently does a little walking with me and is satisfied with a very light quarter plate, says sometimes when he sees my whole plate kit ready to be shouldered, "Well, you must be a fool or a great enthusiast even now to cart that waggon-load of stuff about." Perhaps I am a bit of both, though I really believe the quarter plate does duty oftener and oftener, particularly as the weather gets hotter.

The only disadvantage with the quarter plate is that as one gets on so as to be able to turn out a decent negative and decent print, there will be an intense, and I might almost say an insane, desire to get a bigger camera so as to be able to turn out bigger work, and at the same time, it is hoped, better work, for somehow every tyro seems to think that with bigger plates better work can be done; this is, of course, an absurdity, but still there is always the same feeling, and it frequently leads to the first camera being sold at a sacrifice, and a larger one being bought. If a half plate or whole plate camera is bought in the first place, what are called carriers can now be used, these are small wooden frames which fit into the dark slides, and enable one to use smaller plates than those for which the camera is built. By means of these carriers it is thus possible to use half or quarter plates in a whole plate, or 5 by 4, or quarter plates in a half plate.

Naturally in selling apparatus the larger the size the larger the profit, so this will have some weight with the chemist as a dealer.

The question as to the type of camera, whether square bellows, tapering, or conical also sometimes called Kinnear from their inventor, cannot be decided off-hand. The conical bellows allow of considerable reduction in weight and size of the camera, but they

may sometimes prove a disadvantage in using short focus lenses or the rising front of the camera.

There are three main types of lenses, the single achromatic or landscape, the rectilinear or doublet, and the portrait lens, the last we may dismiss at once as unnecessary, but of the other two I would certainly recommend the doublet as preferable.

We now come to the camera case. For touring there is nothing to equal the knapsack carried on the back. It is thus far easier to carry the apparatus a long time without excessive fatigue than any other way. In having such a case made the main point to be observed is to have the shoulder straps broad and of stout leather; they should be at least 2 $\frac{1}{2}$ inches wide, and padded slightly to prevent them from cutting the shoulders. The knapsack may be made to take only the camera and lenses, and a special hand-case may be used for the dark slides of large size, or if small they may be included with the camera.

The stand, although generally considered as a minor part of the outfit, is important because even although a good camera and lens may be obtained it will be practically rendered useless if a weak rickety stand is obtained which vibrates with every wind. The head of the stand should be large and the spread of the legs where they join the stand as great as possible, as this gives firmness and rigidity, for the nearer they are to one another the more the support approaches that of a point, and a heavy weight on the end of a rod or stand, attached to it by a point, is the least stable of all methods of support.

FORMULÆ AND PRACTICAL DIRECTIONS.

[The formulæ and directions for working here given are specially compiled for pharmacists by a practical chemist and photographer, who will be pleased to supply any special information required, or to answer photographic queries. Letters should be addressed "Editorial Department, 17, Bloomsbury Square, W.C.," with the word "Photography" in upper left-hand corner of envelope.]

PLATINUM TONING BATHS.

For Chloride Papers.

Platinum toning is now all the rage for both gelatin and collodio chloride papers, particularly those with matt surface, and either a liquid or a dry bath may be put up for sale.

Liquid Bath.

Potassium chloroplatinite.....	30 grs.
Lactic acid (sp. g., 1.21)	155 m.
Distilled water.....	10 ozs.

Directions for use—Dilute this solution with double its volume of water before use.

Dry Powder.

Potassium chloroplatinite	15 grs.
Sodium lactate	150 grs.
Acid sulphate or phosphate of soda.....	150 grs.

Directions for use—Dissolve the powder in 35 ozs. of water.

For platinum toning there are three or four conditions which must be fulfilled, and these should be included in the shape of a circular with these baths. After printing the prints should be placed in a solution of salt, 2 ozs.; water, 20 ozs., for at least ten minutes and kept on the move. They should then be washed for five minutes and toned, and when toning is complete transferred to a solution of washing soda, about 1:20, and thence after about five minutes to a fixing bath composed of—

Hypo.....	2 $\frac{1}{2}$ ozs.
Sodium sulphite	1 oz.
Sodium carbonate	$\frac{1}{2}$ oz.
Water.....	20 ozs.

and then thoroughly washed. The above toning baths will keep any length of time, do not eat out the details of the high lights, and will tone several prints in succession, giving sepia brown to brownish black tones, according to

the depth of printing and length of stay in the toning bath. The only difficulty about platinum toning is that it is extremely difficult to tell what the final tone will be, as the printed-out image is either yellowish or reddish-purple; and the deposited platinum is black, so that on fixing we have the purple tone destroyed and the effect of the yellow silver image added to the finely divided platinum black.

BACKING FOR PLATES.

At the present time there is considerable demand for plate backings, which can be easily applied and as readily removed. There are two distinct kinds, one a solution or paste which is applied to the back of the plate, and the other a sheet of paper or cloth coated with some sticky substance which can be temporarily affixed to the back of the plate, and then removed before development, and can be used over again.

The first kind includes collodions, varnishes, and caramels.

Collodion for Backing Plates.

Pyroxylin	5 grs.
Methylated spirit	1 oz.
" ether	1 oz.
Coralline rouge or aurine.....	10 grs.

Allow to stand for three days, shaking occasionally, then decant from any undissolved precipitate and bottle.

Varnish for backing plates.

Gum sandarac	1½ ozs.
Castor oil	1½ ozs.
Methylated spirit	4 ozs.
Dragon's blood.....	150 grs.
or Aurine	75 grs.

Macerate for a week and apply to the back of the plate with a pad.

These need not be removed prior to development.

Caramel Backing.

Caramel is of course nothing more than the liq. sacch. ust. of the wholesale house, but it varies so much that a few words may not be out of place. A good sample of caramel when applied to a piece of glass should dry within twelve hours perfectly hard, if it does not then it has been improperly prepared. But all samples will be improved by the following treatment. Pour, with constant stirring, 5 ozs. of caramel into half a pint of methylated spirit, stir thoroughly about ten minutes, allow to settle for half an hour, then syphon off the supernatant liquid as closely as possible, collect the residue on a piece of fine linen and allow to drain; when thoroughly drained, weigh it and mix with an equal weight of burnt sienna in watery paste as sold by the ordinary oil and colourman, and rub in half its weight of powdered gum arabic.

This should be put up in small 2 oz. tins with tight fitting lids, and labelled—

Caramel and Sienna Backing—A Preventive of Halation.

Directions for Use.—Apply to the back of the plate with a small pad, a roller squeegee or stiff brush, and rear the plate up in a light tight box to dry. This can be readily removed before development by a wet rag.

The second class of backings are made with some sticky, slightly hygroscopic mass, applied to cloth; a good cloth to use is black silesia, and a piece of the desired size should be fastened by drawing pins to a flat board or table. The sticky composition may be made of course like a soft emplastrum adhesivum, using powdered bitumen as the colouring matter, but a preferable compound almost, is one suggested by David. Soak 75 grs. of Nelson's gelatin in half an ounce of water, add 1 oz. of glycerin and half an ounce of dextrin, and dissolve in a water bath, and finally half an ounce of liq. sacchar. ust. Whilst still hot, pour on to the silesia, spreading it with a warm, not hot, plaster iron, and giving it a fairly thick coating; allow to dry and then cut up and pack face to face with wax paper in between.

MEMORY TRAINING.—In an age when competition is keen, anything that will strengthen one's position educationally should meet with encouragement. Professor Loissette's system of improving the memory has met with much success, and has been eulogised by Dr. Andrew Wilson, Dr. Mercier, and other members of the Faculty.

Answers to Photographic Queries.

G. B. WRIGHT says: "In an article on Photographic Formulae in 'Journal Supplement' for May 25, there are instructions for making solution of chloride of gold. It says there that the solution is to be made up to 174½ fluid drachms, and then the solution will contain 1 gr. AuCl₃ in each drachm. Is this correct? If so, the other statement that it is equal to nearly 16 by 15 gr. tubes must be wrong. I tried to work it out, but cannot find how much silver there is in the sovereign." T. H. LIVESLEY also points out that if 15 drs. of the solution be sold for 2s., the total amount realised will be 23s. 2d. only, not 32s.

An Australian sovereign contains 113 grains of pure gold, nearly all 15-grain tubes of commercial chloride of gold are labelled "guaranteed to contain 7 grains of pure gold," therefore, it is obvious that 113 grains of pure gold converted into chloride must be equal to $113 \div 7 = 16\frac{1}{7}$ tubes of chloride. Now it was stated on the 25th ult. that 174½ drachms of solution would be obtained, but this is only equal to $174\frac{1}{2} \div 15 = 11\frac{1}{6}$ tubes—obviously there is an error somewhere. We have seen that an Australian sovereign contains 113 grains of pure gold, and as 1 grain of pure gold will make 1.54360 grains of AuCl₃, it follows that 113 grains of gold must make 174.246 grains of AuCl₃, and if a tube contains 15 grains of gold chloride, 174.246 grains must fill $11\frac{1}{6} \times 16$, etc., tubes, yet this does not agree with the previous statement. Here is the explanation. The commercial chloride is nearly always the acid chloride or chloro-auric acid, AuCl₃HCl.3H₂O, or the double chloride of gold and sodium, sometimes known as the chloro-aurate of sodium, AuCl₂NaCl.3H₂O; and as 113 grains of pure gold = 227.9 grs. of potassium-chloride, AuCl₃KO.3H₂O = 228.6 grs. of sodio-chloride = 228.8 grs. AuCl₃HCl.3H₂O; it follows that actually if you make the solution up to 174½ drachms and sell this at the rate of 2s. per 15 drachms you give too much for the money. Moral: Dilute it more still. Make it up to 230 drachms, and reap the benefit in solid cash.

Instead of the previously suggested label, it might merely be stated: Fifteen drachms of this solution are equal to one tube of commercial chloride of gold.

Rex has got into a difficulty over a stock solution of hydroquinone, as he is unable to make a 10 per cent. solution. The solubility of hydroquinone in water is only 1 in 20, and therefore a 10 per cent. aqueous solution cannot be kept at normal temperatures. The only way to make and keep well a 10 per cent. solution is to use rectified spirit, but equal parts of absolute alcohol and sulphurous acid are preferable; glycerin may be used as the solvent, but as this causes frothing of the developer it is not so satisfactory. The directions on the label sent are extremely unsatisfactory, and were evidently drawn up by a printer and not a photographer, as if the solution is used as directed, there will be over 4 grains of hydroquinone to the ounce, which is unnecessarily strong. The following formulae, however, will answer:—

No. 1.

Hydroquinone.....	48 grs.
Rectified spirit	1 oz.

No. 2.

Sodium hydrate.....	48 grs.
Saturated solution of sodium sulphite ...	1 oz.

Foreign Photographic Formulae.*

Aluminium for Flashlight.—Dementjeff states that 15 gr. of a mixture of aluminium powder; the so-called aluminium bronze, 1 part; potassium permanganate, 3.45 parts; burns in one-eightieth of a second.

Blue Transparencies.—Bujakowitch recommends the ferro-prussiate process for making blue transparencies. Ferric hydrate is precipitated from a solution of ferric chloride by the addition of ammonia or caustic soda, the precipitate washed and dried. To prepare the sensitising solution 154 gr. of ferric hydrate are mixed with 230 gr. of oxalic acid and 3½ oz. of hot water. When dissolved, the solution is filtered, and it should be kept in the dark.

* From Eder's 'Jahrbuch,' through the Amateur Photographer.

Glass coated with plain gelatin solution or else old dry plates, may be used; the latter should be thoroughly fixed and washed, and then immersed for three minutes in the sensitising solution and dried. They require about thirty minutes' exposure in diffused light under a normal negative, and should then be developed with a 10 per cent. to 15 per cent. solution of potassium ferricyanide till they show the necessary vigour, and should then be soaked in a 3 per cent. solution of hydrochloric acid for about five minutes, and then well washed and dried.

Glycin and Pyro Developer.—Hertka warmly recommends a combination of these two developing agents, and suggests the following formulae:—

No. 1.

(a) Water.....	7 oz.
Sodium carbonate	308 gr.
Glycin	62 "
(b) Water.....	7 oz.
Sodium sulphite	618 gr.
Pyrogallol.....	100 "
Sulphuric acid.....	2 to 3 drops.

For use, mix equal parts of a, b, and water. This gives soft results, specially suitable for portrait work.

No. 2.

(a) Water	7 oz.
Potassium carbonate	124 gr.
Glycin	81 "

(b) Pyro solution as with No. 1.

For use, mix as directed for No. 1. This gives negative^s of great density and great clearness, which are specially suitable for platinum printing.

No. 3.

(a) Same as in No. 2, but with 61 gr. of potassium carbonate in addition.

(b) Same as in No. 1.

Mix as in No. 1. This is very suitable for instantaneous work.

Increase of alkali produces more details in the shadows and lessens the intensity of the high lights, thus giving soft negatives. This should be used then for instantaneous work or under-exposure. Increase of glycin and pyro produces denser high lights and more contrast, and this will be useful for over-exposure and flat subjects. Dilution of the developer with water also gives softness. Old developer acts as a good restrainer, producing clearness, and is useful also in case of over-exposure.

Photographic Notes.

TOLUOL OR TOLU.—A curious but possibly pardonable mistake was perpetrated lately by a photographic chemist. A formula for a matt varnish containing toluol was handed to him to be made up, and his customer went away perfectly satisfied that he had obtained what was wanted. He tried it, and to his disgust found that he got a film of brown sticky matter which was not matt in appearance, nor would it dry. The result was a strongly-worded letter to the editor of the photographic journal, whence the receipt was obtained. A polite request from the editor that some of the offending varnish might be sent him for examination brought back a 2-oz. bottle of some treacly-looking liquid, which smelt of tolu. Obviously toluol was mis-read tolu.

POWDERED ZINC FOR RECOVERING PHOTO WASTES.—Dr. Stiebel, of Frankfort, uses zinc in powder to get back the gold from toning baths. This agent renders excellent service for precipitating neutral or alkaline solutions, even when they have a slightly acid reaction. The excess of acid is better neutralised by the addition of alkali, otherwise it would be necessary to greatly increase the quantity of zinc powder necessary to weaken this acid, which is not the case when the solution is neutral or alkaline. Dr. Stiebel took for his experiments a solution of hyposulphite of soda of 1.5, which contained exactly per liter 1.0968 gr. of silver and 0.4648 gr. of gold; 250 cubic centimeters of this solution were treated with 2.5 gr. of zinc powder, which had previously been strongly agitated in pure water. The mixture was stirred with care. At the end of ten

minutes, when the liquid had regained all its limpidity, the filtered solution, treated with sulphide of potash, showed no longer any black coloration, because it no longer contained silver. In the precipitate, Dr. Stiebel found: 0.2715 gr. of silver=98.84 per cent. of the quantity calculated; 0.1150 gr. of gold=98.97 per cent. of the quantity calculated, that is to say, practically the entire quantity of the precious metal that had been used. The advantages that this method has over the sulphite of potash process are twofold. First the gold and the silver are obtained by a single operation, then the solution of liver of sulphur is avoided, pernicious as well for the sense of smell as for the products kept in the laboratory. Zinc dust allows the operation to be more rapidly performed than with the metal in sheets. On the other hand, the gold and silver obtained, especially when they are in small quantities, are more regularly distributed through the pulverulent matter. It follows that in filtering there is less danger of loss. One condition of success is to use exact quantities, say five times the supposed quantity of the precious metal, then to only use a very weak acid solution, and to carefully distribute the zinc powder in the solution. To those who might make the objection that the method proposed by Dr. Stiebel offers some danger by the possible presence of arsenic in the zinc powder, which might give rise to arsenical hydrogen, the author advises operating in the open air or in a laboratory having a good draught.—*Paris Photographes.*

A SIMPLE PHOTO-ENGRAVING METHOD.—W. H. Hyalop gives the following explicit instructions by following which he claims that any one familiar with dry plate photography may produce half-tone printing blocks. Take any of the slower brands of gelatin films—that is, those coated on celluloid—and expose behind a ruled screen in the usual way, giving, of course, a much shorter exposure than given for wet collodion. Develop the plate with the usual pyro-soda formulae sent out by the plate makers, and fix in hypo-soda. Wash thoroughly, and while this is proceeding make up a very hot and saturated solution of chrome alum, and have it in a deep tray. When the washing is completed, plunge the negative into the hot alum solution and keep it there for five or ten minutes, when it will swell where it has not been exposed to the light and remain sunken where it has been exposed. From this solution the plate is taken and washed; it is then placed in a strong solution of chloride of aluminium for ten minutes, then washed again and dried over the stove. When dry it is ready for mounting on the block or for electrotyping. If a small edition of prints is required an electrotpe is unnecessary, because the film is already as hard and as difficult to injure as a copper block. It only remains, therefore, in this case to mount the film on a type-high block with celluloid cement, as used for celluloid electrotypes, and it will stand all the impressions desired. Where a large edition is desired the film may be sent to the electrotypers and manipulated in the usual way. There is no doubt, concludes Mr. Hyalop, but that this is the process of the future, being quicker, simpler, and cheaper than present methods; indeed, it seems impossible that cuts can ever be made at a less price than by this method.—*Inland Printer, and Scient. Amer.*

PHOTOGRAPHIC CONVENTION.—The Photographic Convention of the United Kingdom, or as it is popularly called the P.C.U.K., is to meet this year from July 15 to 20 at Shrewsbury under the presidency of Mr. A. Haddon, one of the staff of the Royal Naval College, Greenwich, a well-known worker in the higher branches of photography. The Convention is a sort of outdoor holiday for photographers, both amateur and professional, who foregather from all quarters of the Kingdom and have enjoyable excursions, very few papers, and those mostly of an evening, some lantern shows, a big dinner, and generally let themselves loose. It is a thoroughly enjoyable reunion, all distinctions and differences of class are sunk, and the very air becomes thick with awful discussions about plates, papers, cameras, etc.; and to see about one hundred or more cameras of all sorts and conditions in the hands of an equally assorted lot of men and ladies, too, sometimes is a matter of some wonderment to the rural population of the districts they visit.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, JUNE 20, 1895.

Since our last report, business in the chemical market has again been quiet, and few movements of importance have occurred. Crystal carbolic acid is again lower, but liquefied acid is fractionally dearer. Both citric and tartaric acids are dull of sale, and cream of tartar is easier. Of the potash compounds, chlorate and permanganate are both very firm. Full details will be found below of the various articles of interest:—

ACID, CARBOLIC.—A very quiet market generally. The current prices are as follows:—*Crystals*: 34° to 35° C., 5½d. per lb.; 39° to 40° C., 6½d. per lb.; 39° to 40° C. (*detached crystals*), 7½d. per lb.; these prices being for bulk quantities in 2 cwt. drums. *Crude*: Unchanged. Sixty per cent. is quoted at 1s. 6½d., and 75 per cent. at 1s. 9½d. *Liquid*: Firmer at 1s. 1d. per gallon for 95 per cent. *Cresylic*: Firmer at 1s. per gallon.

ACID, CHRYSOPHANIC.—Manufacturers' quotations are unaltered. The market is firm at 9s. 6d. to 10s. per lb., according to quantity.

ACID, CITRIC.—Rather firmer. Manufacturers' quotations are unchanged at 1s. 1½d. to 1s. 2d., but in second hands it cannot now be bought under 1s. 1½d.

ACID, TARTARIC.—Quiet and dull of sale. *English* brands of acid are easier, and 11½d. is now accepted. *Foreign* makes are unchanged, the price for both *powder* and *crystal* being 11d.

AMMONIA SALTS.—Carbonate quiet at 3½d. to 3½d. *Liquor* unchanged at 3d. to 3½d. *Sal ammoniac*: First quality is steady at 39s., with seconds at 37s. *Sulphate*: A fluctuating market, and at the close is dull of sale, the quotation for grey 24 per cent. being £9 17s. 6d.

ASHES.—Unchanged. *American* are still worth 40s., with pots at 23s.

ARSENIC.—Very firm owing to the continued scarcity of supplies. The price for best white powder is 15s. 6d.

BLEACHING POWDER.—In good demand at firm rates. On the spot the price is £7 5s. to £7 15s., whilst in Liverpool it is unchanged at £7 10s. to £7 15s., *f.o.b.*

BORAX.—Dull of sale at low rates in second hands. In spite of this Convention prices are maintained at 21s. for *powder*, and 20s. for *crystals*. Second-hand holders offer at 1s. 6d. less.

COAL DISTILLATION PRODUCTS.—Benzole: Unchanged. 50 per cent. still offers at 11½d. per gallon, and the price of 90 per cent. is maintained at 1s. per gallon. Pitch is unchanged, the current quotation being 87s. per ton, *f.o.b.* Tar is worth 10s. 6d. per barrel of 40 gallons.

COPPER SULPHATE.—Firmer. The ordinary brands cannot now be bought under £15 2s. 6d., whilst special makes are worth £15 15s.

CREAM OF TARTAR.—Quiet and dull of sale. Best white French crystals are now worth 67s. to 68s., whilst for German powder the price is 70s. to 71s.

MERCURIALS.—The quotations are unaltered, and the current rates are as follows, for quantities up to 56 lbs.:—*Calomel*: 2s. 11d.; *Corrosive sublimate*: 2s. 7d.; *Red precipitate*: 8s. 2d.; *White ditto*: 8s. 2d.; *Blue pill*: 1s. 8d.; *Ditto ointment*: 1s. 8d.

PHOSPHORUS.—Steady. *Sticks* are worth 2s. 1d. to 2s. 2d., and *wedges*, 2s.

POTASH SALTS.—*Bichromate*: Unchanged at 4½d. to 4½d. *Chlorate*: Very firm. On the spot the price paid has again been 5d., whilst in Liverpool it has been selling steadily at 5d. to 5½d. *Permanganate*: Dearer. Small crystals are now worth 54s. 6d. to 55s. *Prussiate*: Dull of sale at 8½d. to 8½d. In Liverpool the price paid has again been 8d.

QUICKSILVER.—Steady. Second-hand holders still offer at £7 8s. to £7 8s. 6d., whilst importers maintain their prices at £7 10s.

SALTPETRE.—Steady. *British* refined is worth 22s. 6d. to 23s. 6d. on the spot. In Liverpool, the price is 23s. 6d. in kegs, and 23s. in barrels.

SODA COMPOUNDS.—*Bicarbonate*: £7 5s. in London, £6 15s. in Liverpool. *Caustic*: 70 per cent. is worth £8 60 per cent. £1 less. *Crystals*: 38s. *Hypo sulphite*: Firm at £6 15s. to £7 per ton in Liverpool.

THE DRUG MARKET.

THURSDAY, JUNE 20, 1895.

The more interesting features of the Drug Market may be briefly noted. Crude camphor is dull of sale at a decline. Cocaine has been advanced in price, and a further rise may be expected. Of the essential oils the most important change is an advance in H.G.H. oil of peppermint, which closes very firm and will probably be dearer. Full details will be found below of the various articles of interest:—

CAFFEINE.—On the spot it is exceedingly scarce, only small quantities can be had at 27s. per lb., and for delivery it is difficult to get a quotation. It seems that the manufacturers, contrary to expectation are now inconvenienced than ever by their inability to fill orders. It was anticipated that the worst time had passed, and that in a month's time more normal prices might be expected; this, however, has not been realised.

CAMPHOR (CRUDE).—Since our last report there has been a very weak market at a considerable decline. At the close last week 165s. *c.i.f.*, June to August shipment was the price for both China and Japan. The price paid declined to 158s. on Friday, and on Monday a further fall of 8s. occurred. At the close both China and Japan are quoted at 150s. *c.i.f.*, June to August shipment, but there are no buyers.

CAMPHOR (REFINED).—Unchanged. The quotations of British and foreign refiners are still 1s. 9½d. for 10-cwt. lots of bells and flowers, with squares at 1s. 10½d. and proportionate rates.

CLOVES.—Dull of sale. At the auctions the following prices were obtained:—Zanzibar, 3½d.; Penang, 7½d.; and Ceylon, 6½d. For delivery Zanzibar is steady, but rather quiet.

COCAINE.—The reduction noticed last week did not hold good very long, for in a few days the Convention price was advanced 1s. per oz., and the current quotations are new as follows:—For 100 ozs., 14s. 9d.; for 25 to 100 ozs., 15s., and for lots under 25 ozs., 15s. 3d. These quotations are for Cocaine, Hydrochlorate in tin, 1 oz. bottles being charged 8d. per oz. more.

COCHINEAL.—Quiet. A small amount of business has been done privately in black at 1s. 2d. to 1s. 3d., and silver at 1s. 3d. to 1s. 4d.

CODEINE.—Quotations remain unchanged at 10s. 3d. to 10s. 9d., according to quantity and brand.

COLOCYNTH.—Turkey is very firm, and holders ask 2s. for good apple. For fair Spanish, 1s. is the price. There have been no fresh arrivals since our last. Reports from New York advise a strong demand in sympathy with the home market, and holders, both of Trieste and Spanish, have advanced their prices, small quantities only of either variety being offered.

COPAIBA.—Dull of sale. Privately, fair to good Maranhão sell at 1s. 8d. to 1s. 11d. Para, 1s. 5d. to 1s. 7d., and Bahia and Maracató at 1s. 3d. to 1s. 5d.

INSECT FLOWERS.—Nothing positive can yet be predicted as to the new crop, but some opinions prevail that it will be unsatisfactory. In consequence of these rumours very high prices have been paid for closed new flowers for prospective delivery. Hoffman continues to quote open flowers 50s. per cwt.; half closed ditto 78s., and closed ditto, 105s., *c.i.f.*

IPERCACUANHA.—Carthagen root is scarce and very firm. For small second-hand parcels 8s. 6d. is the price, but the quotation is likely to be advanced. There have been no fresh arrivals. Rio (Brazilian) root sells privately at steady rates.

JALAP.—Privately Vera Cruz sells at steady rates, 11d. being the price for fair quality, with damaged at 8d.

MENTHOL.—Dull of sale. The spot price for fair dry crystals is 18s. to 18s. 6d.

MORPHINE.—Unaltered. *Hydrochlorate* is still quoted at 4s. per oz. in 1000 oz. lots, with small wholesale quantities at 4s. 8d.; *crystals* 8d. per oz. more.

OILS (ESSENTIAL).—Mr. Johnson, the British Consul at Pakhoi, in his last official report draws attention to the enormous increase in the amounts of *Aniseed* and *Cassia* oils exported from this district. For *Aniseed* oil, the increase in 1894 amounted to 90 per cent. over the previous year, the figures being 263,400 lbs. for 1894, against 140,267 lbs. for 1893. He attributes this partly to the good crop and partly to the loss of a cargo whilst on its way to Europe, and anticipates a still more prominent position in the Export list of the district. The oil is shipped to Hong Kong, and thence to Macao, where it is repacked into 1 lb. tins. It seems that the trade all lies in the hands of the Macao merchants, who have their representatives in Pakhoi. The trade in *Cassia* oil is stated to be a very profitable one, and would be still more so if it were not for the keen competition amongst the producers. *Star Anise*: Remains dull of sale at 6s. 3d. on the spot. From China advices state that the market is somewhat firmer, and stocks are very small. *Cassia*: Is quiet at 4s. 8d. to 4s. 9d. on the spot for 75 per cent. oil. Reports from China state that no first quality oil is forthcoming, and inferior qualities are also in but small supply. *Citronella*: Firm at unchanged rates, the spot price for oil in tins being 1s. 4d. *Clove*: *English* oil offered at 2s. 7d. to 2s. 8d. *Lemongrass*: Dull of sale at 1½d. *Peppermint*: *H. G. Hotchkiss'* oil is very firm at an advance, and none can now be bought under 10s. per lb. *Japan* oil, containing 40 per cent. of menthol, is worth 7s. 3d. to 7s. 6d., and *dementholised*, 5s. 8d. to 5s. 6d.

OILS (FIXED) AND SPIRITS.—*Castor*: Steady. Fine *Italian* oil is still quoted at 80s. to 81s., c.i.f. *Cotton*: Firm at unaltered rates. *Refined* oil is still worth £18 to £18 5s., according to make and package. *Coco-nut*: Dull of sale. *Ceylon* is worth £22 15s. on the spot. *Cochin*: £24 10s. to £24 15s., and *Mauritius*, nominally £23. *Linseed*: Very firm at a further advance. In barrels on the spot it is quoted at £21 17s. 6d. *Rape*: Steady refined oil is now worth £23 on the spot. *Turpentine*: Lower and dull of sale. *American* spirit on the spot is worth 22s. 3d. *Petroleum*: Flat, with a lower tendency. *American* oil is quoted at 5½d. to 5½d.; *Water white*, 6½d. to 6½d.; and *Russian* at 5½d. *Petroleum Spirit*: Ordinary, 8½d. to 8½d.; *deodorised*, 8½d. to 9d.

OIL (ODD-LIVER).—*Isdahl's* report states that owing to the yield of new oil being from 6000 to 7000 barrels less than last year, a high rate will necessarily be established for the rest of the year. The current rates for new oil is 170s., but by August, at any rate, the quotations will be considerably higher.

OPIMUM.—*Turkey*: For druggists' varieties there has been a good demand, but other kinds are dull of sale. The current quotations are:—*Soft shipping* descriptions, 11s. 3d. to 11s. 6d. for best qualities, with seconds at 10s. 6d. to 10s. 9d.; *best druggists'*, 9s. to 9s. 8d.; *seconds ditto*, 7s. 6d. to 8s. 6d. *Persian* is steady at 12s. 6d. to 13s. for fine qualities.

ORRIS ROOT—Unchanged *Florentine* root being quoted at 73s. per cwt. for good sorts, with best selected at 77s. c.i.f.

PERU BALSAM.—Somewhat dull of sale. Good genuine balsam offers at 9s. 3d. to 9s. 6d. per lb.

QUININE.—There have been no sales of importance during the week, but prices are well maintained. *H. B.* and *B. & S.* are quoted at 1s. 0½d. on the spot for moderate quantities.

SAFFRON.—Dull of sale, and quotations are lower. Super extra *Valencia* is now worth 28s. 6d. per lb.

SALICIN.—Makers' quotations are unaltered, the current quotations for 1-cwt. lots being 8s., with 28 lbs. at 8s. 6d.

SANTONIN.—The present price is 5s. 6d. per lb. net.

SOY.—Dull of sale and fair *China* offers at 1s. to 1s. 1d. on the spot.

TOLU (BALSAM).—Steady. The spot price for good quality Balsam is 1s. 5d. From New York a strong market is reported with steadily advancing prices, owing to its scarcity, and holders are by no means anxious to sell

as there are no advices of any supplies coming forward at present.

WAX (JAPAN).—Very quiet, and good squares offered at 26s.

Trade Notes.

THE BRITISH ANTITOXINE COMPANY having pointed out to Mr. Lennox Browne that his recent article on the failure of the antitoxic serum in diphtheria had caused many of the public and medical men to hurriedly conclude that he had been attacking their preparation, he has written them as follows:—"I am flattered by the suggestion that my disagreement with the claims of the so-called antitoxic serum in the treatment of diphtheria could injure the sale of your antitoxine. But since you ask me, I am happy to re-echo the terms of your own letter, and to say that nothing could have been further from my mind than a desire to do your remedy the smallest injury, and that my adverse article referred to the anti-diphtheritic serum alone."

MESSRS. WILLIAM COOPER AND NEPHEWS, the well-known sheep dip manufacturers of Berkhamsted, have determined to give every farmer in the United Kingdom whose name and address are obtainable, a chance of expressing his opinion on the various questions affecting the agricultural industry, and with the object of carrying out this gigantic and costly scheme, a circular with an exhaustive series of questions attached, has been dispatched to the occupier of every holding in Great Britain. It is intended to tabulate the opinions received, and to issue a report containing a digest of such opinions.

MESSRS. POWELL AND BARSTOW, of 58, Blackfriars Road, London, S.E., submit revised price-lists of the different goods which they supply, including surgical instruments, elastic gum, rubber and gutta-percha goods of every description, splints, elastic stockings, trusses, microscopic dissection instruments, and various druggists' sundries. The lists should be found worthy of attention by chemists and druggists.

FALLOWFIELD'S 'Photographic Remembrancer' for June contains particulars of a large number of novelties and useful lines for photographers, and in the supplementary spring season sale-list of photographic material details are given of numerous bargains. Send to Jonathan Fallowfield, 146, Charing Cross Road, W., for a copy.

MESSRS. BURROUGHS, WELLCOME AND CO., of Snow Hill Buildings, London, E.C., forward a tube containing one gramme of dry anti-diphtheritic-serum (B. W. and Co.) prepared in the form of fine golden scales. The firm claims to have been the first to prepare anti-diphtheritic-serum in this active, portable, and permanent form, possessing the full potency of the liquid serum. The therapeutic activity of the contents of each tube of this dry anti-diphtheritic-serum (B. W. and Co.) is attested by the medical director in charge of their Bacteriological Laboratory, and is guaranteed. The dried serum is freely soluble in about twice its volume of cold water. The contents of the tube represent 10 cubic centimetres of the normal liquid anti-diphtheritic serum, and it is customary to dissolve this quantity in ten cubic centimetres of cool water, which has been previously boiled. This form of the serum is guaranteed to keep for any reasonable period under ordinary conditions—a great advantage over the fluid serum, which is very difficult to preserve for any length of time. Anti-diphtheritic serum exsicc. (B. W. and Co.) is supplied in these 1 gramme tubes at 1s. per tube.

MESSRS. TAME AND CO., Boacombe, have a dark-room free to customers for changing from 9 a.m. to 8 p.m., and hold a stock of all the leading plates, papers, and photo requisites.

MR. CHAS. CROOK, chemist and druggist, Easthorpe, Mirfield, Yorks, has also a free dark-room for changing and developing, and stocks plates, papers and chemicals.

Personal Notes.

MR. WILLIAM BAXTER, pharmaceutical chemist, has purchased the business lately carried on by Mr. C. M. Footitt, at Great Marlow, Bucks.

MR. FOOTITT had conducted the business for twenty-five years, and was preceded in the proprietorship by his father.

MR. ERNEST J. EASTES, F.I.C., who has for many years acted as assistant to Dr. Attfield, is to succeed Mr. F. W. Short, B.Sc., as demonstrator at the School of Pharmacy.

Mr. Thomas Tickle, a former Bell Scholar, who is at present working in the Pharmaceutical Society's Research Laboratory, will act as assistant-demonstrator in the School.

DR. F. SCHÜTT, of Kiel, has been appointed Professor of Botany and Director of the Botanical Gardens and Museum, at Greisswald University.

DR. CELAKOVSKY is appointed Professor of Pharmacology at the Bohemian University, Prague.

DR. V. KNORRE is the first occupant of the chair of electro-chemistry at the Technical High School, Charlottenburg.

PROFESSOR HUXLEY has had a relapse, and is reported to be in a critical condition.

Exchange.

[Notices of books, apparatus, etc., for exchange, of reasonable length, are inserted free in this column, if they do not partake of the nature of ordinary advertisements. The notices should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C."]

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

BRITISH PHARMACOPEIA, 1885, if complete, passable condition; lowest offer accepted.—Slack, 351, Lower High Street, West Bromwich.

COMPOSITION MORTAR, 17 in. diameter, and pestle.—Hill, Chemist, Lincoln.

OFFERED.

YEAR-BOOK OF PHARMACY, 1874 to 1879, good condition, what offers? British plants or mosses preferred.—Allen, Chemist, Canning Town, E.

Books for Minor, etc., various, cheap; also pocket microscope, botanical lenses. Stamp for descriptive list.—8, Crosby Road North, Waterloo, Liverpool.

|| BICYCLE.—Coventry Machinists' "Swift"; pneumatic tyres, ball bearings throughout. Good condition, with all accessories. Cost £21, will take £8 10s.—Apply Simpson, 6, Stonebridge Park, Willesden.

STOMACH PUMP, Pestle and Mortar, and Dispensing Scales, for disposal by widow of chemist in needy circumstances, all in good condition.—Apply by letter to A.B., care of Mr. Bremridge, 17, Bloomsbury Square, W.C.

STRAMONIUM PLANTS.—Have a quantity suitable for botanical specimens. Price, 2s. per dozen.—Williams, Chemist, Longfleet, Poole.

TRICYCLE, strong and well made, 48 in. wheels, india-rubber tyres. Price 25s. cash.—G. N., 6, Ringford Road, Wandsworth.

Cricket News.

WRIGHT, LAYMAN, AND UMNEY'S C.C. v. STAFFORD ALLEN'S C.C.—A match between the representative teams of these two wholesale houses was played on the ground of the former, at Hyde Farm, Balham, and resulted in a win for the Southwark firm, who scored 98 to their opponents 53.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

SATURDAY, JUNE 22.

Pharmaceutical Cricket Club v. Cheam Common (Worcester Park). Train leaves Waterloo at 2.10 p.m.

TUESDAY, JUNE 25.

Royal Photographic Society, at 8 p.m.
"A Demonstration by Mr. Packham of his Process of Toning Platinum Prints."

WEDNESDAY, JUNE 26.

Society of Arts, at 4 p.m.
Annual General Meeting and Election of Officers.
Edinburgh Chemists', Assistants', and Apprentices' Association.

Excursion to Colinton Dell. Leave Caledonia Station at 8.30 p.m.

Plymouth, Devonport, Stonehouse, and District Chemists' Association (Junior Section), at 8.30 p.m.

Fourth Lecture on Materia Medica, by Mr. John D. Turney.

THURSDAY, JUNE 27.

School of Pharmacy Students' Association, at 7 p.m.

Annual Report of Executive Committee.

School of Pharmacy, at 8 p.m.

Presentation of testimonial to Mr. F. W. Short, at 17, Bloomsbury Square, W.C. Past and present students at the School are invited to be present.

Company Business.

PIONEER SYNDICATE, LIMITED.—Registered on June 10, by W. H. Morrell, 98, High Holborn, W.C., with a capital of £1000 in £1 shares. Object, to carry on the businesses of chemists, druggists, grocers, wine merchants, etc., in all or any of their respective branches. Registered without articles of association.

KENT DRUG STORES, LIMITED.—Registered on June 3 by R. Davies, 46, Chancery Lane, W.C., with a capital of £5000 in £1 shares. Object, to adopt and carry into effect a certain agreement, and to carry on the general business of chemists and druggists.

Late Advertisements.

Assistants Wanted.

AT ONCE a JUNIOR ASSISTANT. Must be a good Dispenser. Indoors. State age, height, previous experience, with references and photo to STURTON & SONS, Wholesale Druggists, Peterborough.

SENIOR ASSISTANT. In-doors. Qualified. Age 25 to 30. Must be a good Counterman, with a knowledge of Prescribing. Apply personally, between 12 and 1 p.m., and after 7 p.m., or by letter, with full particulars, enclosing photo, if convenient (to be returned), to DAVEN THOMSON & Co., 137, Queen's Crescent, N.W.

Businesses for Disposal.

SURREY. 10 miles from City.—An exceptionally profitable Retail, Dispensing and Prescribing BUSINESS, with good specialities. Returns £600. Net profit fully 50 per cent. Corner shop. Long lease. Rent £30. Same hands 8 years. Owner having bought a larger business is sole reason for selling. Price £525. Apply PAPER, care of Herrings & Co., 40, Aldersgate St., E.C.

CHEMIST'S (suburban).—Thoroughly genuine well-established BUSINESS, for immediate disposal. Excellent premises. Capital position. Moderate rent. Good-class profitable trade and Dispensing connection. Ingoing for superior fittings. Stock, &c., about £250, or by valuation, without premium. Exceptional opportunity. Messrs. WICKENDEN, 20, High St., Tunbridge Wells.

Pharmaceutical Journal

SUPPLEMENT

LONDON, JUNE 29, 1895.

Personal Notes.

SIR EDWARD MAUNDE-THOMPSON, Chief Librarian of the British Museum, has been elected a corresponding member of the Philosophical Historical Section of the Berlin Academy of Sciences.

DR. THORNE THORNE has been elected a foreign member of the Société Française d'Hygiène.

PROFESSOR FRASER is stated to have obtained definite proof of the antidotal properties of the blood serum of venomous serpents, and he will shortly publish a further communication on the subject.

MR. W. SPENCER TURNER, pharmaceutical chemist, has purchased a business at Willingham, Cambs.

MR. WILLIAM J. BETHUNE, Inverness, deputy-superintendent of the Pharmaceutical Society's First Examination, was married at 274, High Street, Forres, on the 19th inst., by the Rev. Dr. Keith, to Bella, second daughter of James Bowie, Forres.

MR. JOSIAH CLARKE, pharmaceutical chemist, Croydon, has suffered from the effects of a fire which broke out on the evening of June 25, in the upper part of the building in which his pharmacy is situated.

MR. JOHN HALLAWAY, pharmaceutical chemist, Carlisle, is to be congratulated on the fresh success of his son, R. B. Hallaway, a Student of the Pharmaceutical Society, who has just passed his final examination for the Associateship in Science of the Durham College of Science, with honours and prizes in Chemistry.

ACCORDING TO THE *Fall Mall Gazette*, the Rev. (sic) Professor Michael Foster has received the honorary degree of Doctor of Civil Law at Oxford. Presumably the respected Secretary of the Royal Society is referred to, since he was thus honoured, together with Sir William Henry Flower, of the British Museum, and others, at the Oxford Commemoration on Wednesday last.

PROFESSOR RÜCKER is reported to have accidentally inoculated himself with the virus of diphtheria, whilst investigating the antitoxic treatment of the disease.

Trade Notes.

MR. JOHN MILNE, of the Antiseptic Dressings Factory, Ladywell, S.E., offers a new accouchement and operation sheet, consisting of a pad of sterilised cellulose enclosed in an outer covering rendered antiseptic by treatment with corrosive sublimate. It can be made in various sizes, but the most convenient one is 2 feet square, and costs 1s. 6d.

MESSRS. BURROUGHS, WELLCOME and Co. have received from a correspondent in Shansi, North China, a letter, from which the following is an extract:—"The two cases of tea 'tabloids' reached us here a few days ago. In this part of China—indeed, all over China north of the Yellow River—tea is comparatively little drunk; the soil and climate being unsuitable for its cultivation, and the time and difficulty encountered in transporting up from the Yang-tse valley rendering it somewhat expensive. Boiled water and thin gruel of millet are the usual drinks of the masses, so that the tea 'tabloids' are greatly appreciated by us. The ingenuity which is displayed in the 'tabloid' is, I need scarcely say, very striking in the eyes of the Chinese as well as our own."

MR. A. D. RAE, chemist and druggist, 6, Railway Place, Fenchurch Street, E.C., has fitted up a free dark-room for customers.

MR. WILLIAM TYLAR, 14, High Street, Aston, Birmingham, will send a new edition of his price-list of novelties and useful appliances on receipt of price—fourpence.

THE EASTMAN PHOTOGRAPHIC MATERIALS CO., LTD., OXFORD STREET, W., has recently commenced to publish a small penny monthly paper—the *Kodak News*. The June number contains several notes of interest to photographers and others, especially two on the Kodak inside the Great Pyramid and in the Land of the Pharaohs.

MESSRS. BURROUGHS, WELLCOME and Co. have arranged an admirable programme of arrangements in connection with the eleventh annual dinner and excursion of their employees, on Saturday, June 29. Special trains leave Dartford and London Bridge at 7.45 a.m. and 8.15 a.m., respectively, arriving at Portsmouth at 10.45 a.m. Dinner and tea will be served at the Esplanade Hotel, Southsea, and the special train will leave Portsmouth at 7.55 p.m.

MESSRS. TYPEKE and KING, chemical manufacturers, advise their customers that their City address will in future be 7, Jeffreys Square, St. Mary Axe, E.C.

THE APOLLINARIS COMPANY, LTD., sends the following note on a New "Departure" in the Natural Mineral Water Trade:—"The *Carisbrook Castle* sailed from London for the Rhine on the 13th inst. with a cargo of Royal German Seltzer Water, consisting of 146,000 full bottles. These bottles were brought over to London from Germany last year, and it cannot be said that they are sent empty away! It is to be presumed that the large advertisements which have appeared in recommendation of this water have not met with the anticipated response from the British public. What has occurred will doubtless act as a check upon those sanguine persons who are for ever introducing new German table waters into this country."

Literary Intelligence.

MESSRS. LONGMANS, GREEN and Co. have nearly ready Mr. H. S. Hoole Waylen's 'Thoughts from the Writings of Richard Jefferies.' The same publishers have in preparation two books on chemistry and physics to meet the new requirements of the Science and Art Department, namely, 'Inorganic Chemistry,' by G. S. Newth, F.I.C., F.C.S., Demonstrator in the Royal College of Science, London, Assistant Examiner in Chemistry, Science and Art Department; and 'Physics,' by W. Watson, B.Sc., Demonstrator in Physics in the Royal College of Science, London; Assistant Examiner in Physics, Science and Art Department.

A READABLE article on "Rhubarb" appears in *Chambers' Journal* for June, the history and cultivation of that edible being dealt with in an interesting fashion. There is also an article on "Ginseng" which should interest pharmacists.

BENTLEY'S BOTANY is no more, the new manual published by Messrs. J. and A. Churchill, being described as "based upon the manual of the late Professor Bentley," by Dr. J. Reynolds Green, Professor of Botany to the Pharmaceutical Society, who has recently been elected a Fellow of the Royal Society. The first volume only has been issued, and is devoted to morphology and anatomy, the latter section having been almost entirely re-written, whilst the chapters on morphology have been brought up to date.

MARKET REPORT.

Chemicals and Drugs.

[The quotations here given are in all cases the lowest net cash prices for bulk quantities, and often the articles quoted have to be sorted in order to suit the requirements of the pharmacist. It is important that this should be borne in mind in making any comparison between the prices quoted and those of the wholesale drug trade.]

THE CHEMICAL MARKET.

THURSDAY, JUNE 27, 1895.

The most important features in the Chemical Market are as follows:—Carbolic acid is very dull of sale, and the prices are lower all round. Citric acid is fractionally lower, and tartaric acid is dull of sale. There are few inquiries for cream of tartar, which is considerably cheaper. Of the potash salts, chlorate has again been a firm market. Full details will be found below:—

ACID, CARBOLIC.—A very flat market owing to the absence of foreign inquiries; quotations are lower all round. The current prices are as follow:—Crystals: 34° to 35° C., 5½d. per lb.; 39° to 40° C., 6d. per lb.; 39° to 40° C. (detached crystals), 7d. per lb. Crude: 60 per cent. is quoted at 1s. 6d., with 75 per cent. at 1s. 9d. Liquid: 95 per cent., 1s. 0½d. per gallon, with *Cresylic* at 1½d. per gallon.

ACID, CITRIC.—Quiet. Manufacturers' quotations are 1s. 1½d. per lb., whilst in second hands it can be bought for 1s. 1½d.

ACID, OXALIC.—Unchanged at 3½ net ex rails.

ACID, TARTARIC.—Quiet at unchanged rates. For English brands of acid 1½d. is the price, whilst foreign makers quote both powder and crystals at 1½d.

AMMONIA SALTS.—Carbonate: Quiet at 8½d. to 8¾d. Liquor: Unchanged at 8d. to 8¼d. *Sal ammoniac*: Both firsts and seconds are unchanged at 39s. and 37s. respectively. Sulphate: Quiet, but fairly steady. At the close grey 24 per cent. is worth £9 17s. 6d.

ASHES.—Unchanged. Canadian pot ashes are worth 23s., with pearl ashes at 40s.

BLEACHING POWDER.—Unchanged. The spot price is £7 5s. to £7 15s., whilst in Liverpool it is unchanged at £7 10s. to £7 15s., f.o.b.

COAL DISTILLATION PRODUCTS.—Benzole: Lower. 50 per cent. is now worth 1½d., with 90 per cent. at 1½d. per gallon. Pitch: Steady at 37s. 6d. per ton, f.o.b. Tar: Firm at 11s. per barrel of 40 gallons.

COPPER SULPHATE.—Steady at unaltered rates. The quotations range from £15 2s. 6d. to £15 15s., according to brand.

CREAM OF TARTAR.—Dull of sale at lower rates. Fine white French Crystals are now quoted at 66s. 6d. to 67s. with German brands of powder at 68s. 6d. to 71s.

POTASH SALTS.—Bichromate: Unchanged at 4½d. to 4¾d. Chlorate: Reports from New York state that the market is very firm and higher prices are generally anticipated, in consequence partly of the strong tone of the home market. On the spot 6d. has been paid, whilst in Liverpool the same rate has been paid, but the demand has slackened. Permanganate: Firm at 54s. 6d. to 55s. for small crystals. Prussiate: Quiet at 8½d. to 8¾d. The Liverpool price is 8d.

QUICKSILVER.—Steady. Second-hand holders continue to offer at £7 8s. to £7 8s. 6d., whilst importers' prices are maintained at £7 10s.

SALTPETRE.—Unchanged. British refined is quoted at 22s. 6d. to 23s. 6d. on the spot. In Liverpool the price is 23s. 6d. in kegs, and 23s. in barrels.

SODA COMPOUND.—Bicarbonate: £7 5s. in London, £6 15s. in Liverpool. (caustic: 70 per cent. is worth £8 with 60 per cent. £1 less. Crystals: 33s. Hypsulphite: Much dearer. The Liverpool price is £7 to £7 10s.

THE DRUG MARKET.

THURSDAY, JUNE 27, 1895.

The drug sales to-day passed off very quietly. A limited amount of business was done in Brazilian *ipecaouanha* at fully steady to dearer rates; no Carthagena root was offered. Beeswax was largely offered, and a fair amount was sold at easier rates. Cubebs and gamboge sold cheaply, but cardamoms were very firm, especially for the better qualities. Full details will be found below:—

ACACIA.—A moderate amount only was offered to-day. Of this 6 packages of clear amber lump sorts from *Suez* and *Alexandria* sold without reserve at 45s. The majority of the rest was bought in; palish Turkey sorts at 50s., and *Mogador* sorts at 41s. 6d. down to 33s.

ACONITE (Japanese).—A parcel of 15 bags was offered, and part sold at 22s. 6d., showing a steady rate.

ALOES.—No Cape was offered to-day. *Curacao* was in moderate supply, but was all bought in at rates ranging from 45s. for good livery down to 32s. for ordinary brown. Of *Socotrine* 190 kegs were offered, but all bought in, fair softish brown of good aroma at 70s. to 72s. 6d., and other grades at 15s. to 35s.

AMMONIACUM.—None was sold to-day. Good loose drop gum, slightly blocky, was bought in at 43s. to 47s. 6d.; part blocky at 40s.; mixed dark seedy block at 30s. to 35s.; and very seedy drosey gum at 22s. to 25s.

ANISEED.—No inquiries. A parcel of 16 bags of Italian seed were bought in at 25s.

ANNATTO.—In moderate supply. Twenty-seven packages of good bright Madras seed were bought in at 4½d.

ARABICA.—Ten cases of inferior quality were offered to-day which were bought in at the last sales. There being no inquiries, they were bought in to-day at 1s. 3d.

ARECA NUTS.—Fair quality Colombo nuts were bought in at 12s. 6d.

BENZOLIN.—A small amount only of Siam gum was offered. A few cases of medium dark and grey siftings in block sold at 70s. No *Sumatra* gum was sold, ordinary to good almondy seconds being bought in at £7 to £8 12s. 6d. A few cases of thirds Palembang sold at 26s. to 30s.

BIRDLIME.—Eleven cases of Japan were bought in at 1s. 3d.

BUCHU.—No inquiries. Dull long narrow leaves were bought in at 7d., and good bright round leaves at 3½d. the limit being 3d.

CAFFEINE.—Very firm. The spot price for small lots in second hands remains at 27s. 10 3/4s., whilst for September delivery 21s. has been paid.

CAMPHOR (Crude).—Since our last report prices have further considerably declined. At the end of last week sales were made of China for delivery, June to August steamer, at 150s. c.i.f. These were followed by a slight improvement to 152s. 6d. c.i.f., with Japan offered at 153s. c.i.f. On Monday, however, prices fell to 147s. 6d. c.i.f. for China and 150s. c.i.f. for Japan. At the close the market is somewhat firmer. On the spot Japan has sold at 162s. 6d. to 165s. To-day 63 cases of China were offered, and bought in at 160s., a bid of 157s. 6d. being refused.

CAMPHOR (REFINED).—Unchanged. The quotations of British and German refiners are still 1s. 9½d. for 10 cwt. lots of bells and flowers, with squares at 1s. 10½d., and proportionate rates. To-day 2 casks of German were bought in at 1s. 8d. per lb.

CANADA BALSAM.—Dull of sale. To-day 3 casks were bought in at 1s. 6d. per lb.

CANNABIS INDICA.—No inquiries. Brownish stalky tops were bought in at 3½d. to 3¾d. A parcel of 60 Robbins of dusty tops were bought in at 2¾d., although a bid of 1½d. would have been accepted.

CANTHARIDES.—Twenty-one cases of fair Chinese were bought in at 1s. to 1s. 1d.

CAPSICUMS.—Thirty-four bales sold freely at 12s. 6d. to 13s., with water damaged at 9s. 6d.

CARDAMOMS.—In moderate supply only, but selling at very firm to advanced rates. The following were the quotations:—Ceylon Mysore: Fine bold pale plump, 4s. 1d. to 4s. 2d.; medium to bold pale plump, 2s. 2d. to 2s. 7d.; small, 1s. 9d. to 1s. 1½d. down to 1s. Seed was bought in at 2s., the price asked being 1s. 10d.

CASCARILLA.—Three bales only were offered; these consisted of small bark, and were bought in at 40s.

CASSIA FISTULA.—Of 41 bags of fair *Dominica* pods, 9 sold at 18s.

CAYENNE PEPPER.—A single case sold at 6d. per lb.

CHIRETTA.—Dull of sale. Eleven bales were bought in at 2½d.

CINCHONA.—At the bark sales on Tuesday, the 25th inst., the amount offered was considerably less than last month, and met with a good demand at fully steady to dearer rates. To-day 96 serons sold freely at 9d. to 11½d., with first-class damaged at 7½d., and second ditto at 4½d. to 5½d. *Carthagenia* bark was bought in at 1s.

CLOVES.—Quiet. At the sales on the 26th inst. only a few bales of *Amboyana* were offered, which were bought in at 4½d. *Zanzibar* are firmer privately at 2½d., July to September delivery.

COCA.—Fair broken *Truzillo* leaves of good colour were bought in at 1ld. to 1s. the limit being 1d. less. A single package of *Ceylon* leaves sold at 1s. for first-class sea-damaged.

COCAINE.—Unchanged. 100-oz. lots are quoted at 14s. 9d. per oz., with smaller quantities in proportion.

COLOCYNTH.—Two cases of fair *Turkey* apple were bought in at 2s., and 13 cases of broken *Spanish* at 10d. to 1s. 3d., according to quality.

COPAIBA.—Dull of sale. Three casks of pale cloudy *Maranham* were bought in at 1s. 9d.

CORIANDE SEED.—A parcel of 28 bales of *Bombay* seed sold at 5s. to 7s. 6d. Another lot, also from *Bombay*, sold "without reserve" at 3s. 6d. to 4s. 6d.

CUBEBES.—Sold freely at a considerable fall. A parcel of 75 bags of fair brown *Singapore* berries sold at 34s. to 35s., and another parcel part sold at 32s. 6d.

CUMIN SEED.—Fair *Mogador* seed was bought in at 28s.

DILL SEED.—Neglected. Sixty-three bags were bought in at 18s. to 15s.

DRAGON'S BLOOD.—None was sold to-day. Good bright gum, partly broken, in *reed* was bought in at £13, fair bright seedy lump at £7 to £8 10s., and dark *saucers* at £6 5s.

ELERI GUM.—A parcel of 51 cases of *Manilla* gum sold freely at very firm rates, ranging from 28s. for good clear pale gum down to 23s. 6d. for somewhat dirty ditto.

ERGOT.—Weevily *Spanish* was bought in at 8d.

FENNEL SEED.—Fair bright *East Indian* seed was bought in at 15s. to 16s.

GAMBAGE.—Lower. Good free pipe of clean fracture sold very cheaply at £9 17s. 6d., and somewhat dull ditto at £8. The rest was bought in at £10 10s. for good free pipe, £9 for blocky pipe, and £8 10s. for pickings.

GUAIACIUM.—Sold at 1s. 1ld. to 2s. for good gum of bright fracture down to 1s. 4d. Drossy grades were bought in.

HONEY.—Very dull of sale. The only parcel sold to-day was 2 casks of darkish brown *Jamaica*, which fetched 22s. 6d. *Australian* was bought in at 20s. to 25s., and *Californian* at 45s.

IPECACUANHA.—A moderate supply only found purchasers to-day, but the prices realised were high. Good sound annulated *Brazilian* (Rio) root sold at 4s. to 4s. 6d. No *Carthagenia* root was offered, and it is very scarce. For odd quantities holders ask 8s. 8d.

INSECT FLOWERS.—*Hoffmann* reports no change in the market, and quotes open flowers at 50s. per cwt.; half-closed ditto, 78s. per cwt.; and closed cultivated ditto at 105s. per cwt.

JABORANDI.—Bold *grayish* leaves were bought in at 9d., and mixed leaves, with a lot of wood, were bought in at 6d.

JALAP.—The better qualities of *Vera Cruz* were bought in at 1s. to 1s. 3d. Sea-damaged root fetched 8d.

KINO.—Five cases of red gum mixed with bark were bought in at 50s., and good genuine gum in tears at £20.

KOLA.—None was sold to-day. *West Indian* were bought in at 10d. to 1s. 6d.

LYCOPodium.—In steady demand. It is quoted at 200s. per cwt., c.i.f.

MASTIC.—Seventeen cases of good bright gum in tears were bought in at 2s.

MENTHOL.—Dull of sale. On the spot 13s. 9d. to 14s. per lb. is asked for good white, dry crystals. To-day two cases of *Cocking's* were bought in at 17s. 6d.

MYRRH.—A trifle easier, and there is no demand. To-day fair clean pickings sold at 45s. subject, good clean

ditto 50s., also subject. The remainder was bought in at 92s. 6d. to 110s. for fair to good picked gum, fair to good pickings, 54s. to 65s., down to 20s. for dark chips.

NUX VOMICA.—Selling at very low rates, medium pale seed from *Calicut* sold at 8s. to 8s. 3d., and small ditto from *Madras* at 3s. 3d. to 4s., with damaged ditto at 2s. to 3s. Good bold *Bombay* seed was bought in at 15s.

OILS (ESSENTIAL).—*Star anise* remains dull of sale at 6s. 2d. to 6s. 3d. on the spot. *Cajeput*: 20 cases were bought in to-day at 2s. 8d. *Cinnamon*: No inquiries. Bought in at 1s. *Cassia*: Lower at 4s. 6d. to 4s. 7d. for oil showing 70 to 75 per cent. cinnamic aldehyde. *Citronella* steady. On the spot 1s. 4d. per lb. is the price for oil in tins. *Fisher's* oil was bought in at 2½d. per oz. *Lemon* sold without reserve at 2s. *Lemon grass* dull of sale at 1½d. *Bergamot* sold "without reserve" at 2s. 6d. *Orange* sold "without reserve" at 2s. *Peppermint*, *H. G. Hotchkiss*: Five cases sold to-day at 10s. per lb. *Cocking's* was bought in at 6s. 6d., and 40 per cent. *Japan* at 6s. *Rose*. All bought in at 5d.

OIL (COD-LIVER).—*Isdahl* reports the continued firmness of the Bergen market, and unaltered quotation of 170s. per barrel of 25 gallons.

OILS (FIXED) AND SPIRITS.—*Coco-nut* quiet. *Ceylon* is quoted at £22 10s. to £22 15s.; *Cochin* at £24 10s. to £24 15s., and *Mauritius* at £23 on the spot. *Cotton* steady. *Refined* oil is quoted at £17 15s. to £18 10s., according to make and package. *Linseed* very firm at a slight advance. On the spot in barrels it is quoted at £21 12s. 6d. *Rape* dull of sale, but steady at £22 15s. to £23 for refined oil on the spot. *Turpentine* falling steadily. *American* spirit is now worth 21s. 9d. on the spot. *Petroleum* firm. *American* oil is quoted at 6d.; *water white*, 6½d. to 7½d., and *Russian*, 5½d.

OTTO OF ROSES.—Reports state that the collection this year has not excelled 2400 kilos., which compares favourably with last year, but as there is no old stock the price will in all probability not be advanced.

OPIMUM.—*Turkey*: For *druggists'* kinds a fair demand continues, but other kinds remain dull of sale. The current quotations are:—*Soft shipping descriptions*, 11s. 3d. to 11s. 6d. for best qualities, with *seconds* at 10s. 6d. to 10s. 9d.; *best druggists'*, 9s. to 9s. 3d.; *seconds ditto*, 7s. 6d. to 8s. 6d. *Persian*: Steady at prices ranging from 11s. for common grades up to 12s. 9d. for fine qualities.

QUININE SULPHATE.—There are but few enquiries, and quotations are fractionally easier. *H.B.* and *B. & S.* are quoted at 1s. 0½d. on the spot.

SAFFRON.—Unchanged. Super extra *Valencia* is worth 23s. 6d. per lb.

ORANGE PEEL.—Very dull of sale. Good thin cut *Maltese* was bought in at 9d., coarse ditto at 4d. to 4½d.

RHUBARB.—Dull of sale. A few cases of high dried *Canton* of fair fracture sold at 9½d. to 10d., and small round *Canton* of pinkish fracture at 1s. 2d. per lb.

SARSAPARILLA.—Ordinary *Jamaica* sold at 8½d., good grey *Jamaica* at 1s. 2d. to 1s. 4d. *Mexican* at 2½d. to 3½d. *Honduras* was bought in at 1s. 1d. to 1s. 2d.

SCAMMONY.—Twenty-four bales of good bold root sold at 36s.

SENEGA.—Bought in at 1s. 5d. The spot price is about 1s. 3d.

SENNA.—A small amount only of *Tinnivelly* leaves was offered to-day, and fairly steady prices were realised; 5d. to 6d. being paid for fine green medium to bold, 2½d. to 3½d. for medium greenish, and 1½d. to 2½d. for ordinary small leaves. All the *Alexandria* leaves and pods were bought in.

TAMARINDS.—A parcel of *East Indian* sold freely at 5s. 3d.

THYME SEEDS.—Bought in at 8s. 6d. to 9s.

TOLU BALSAM.—On the spot 1s. 7½d. has been paid. At the sales to-day 11 cases sold at 1s. 6d. per lb.

WAX (Bees).—There was a large amount of *Jamaica* and *Madagascar* wax offered. The former sold at £7 17s. to £8 5s., showing a fall of about 2s. 6d. Bleached *East Indian* sold at £6 7s. 6d., *Zanzibar* at £6 10s. *Australian* at £6 17s. 6d., and *Madagascar* at £6 12s. 6d. to £7 10s.

WAX (JAPAN).—Fifty cases of fair *squares* sold at 25s. subject.

Exchange.

[Notices of books, apparatus, etc., for exchange, of reasonable length, are inserted free in this column, if they do not partake of the nature of ordinary advertisements. The notices should be written on post-cards, addressed "Editorial Department, 17, Bloomsbury Square, W.C."]

WANTED.

'PHARMACEUTICAL JOURNAL,' February 23, 1895.—Full price will be paid by the Secretary, 17, Bloomsbury Square, London, W.C.

BOOKS.—Prantl and Vine's 'Botany,' Fownes' 'Watt's Inorganic Chemistry'; must be latest editions.—G. W. Kendall, Market Place, Bedford.

SQUIRE'S 'COMPANION,' 1894, in good condition.—Lowest price to Jenner, Chemist, Meeting House Lane, Peckham, S.E.

LANCASTER'S OMNIGRAPH $\frac{1}{4}$ -plate camera.—Lee, Chemist, Guiseley.

BOOKS.—Lindley's 'School Botany,' and Flückiger and Hanbury's 'Pharmacographia.' State lowest price, or will exchange 'Taylor on Poisons' or Brown's 'Manual of Assaying.'—Chemicus, 49, Harcourt Road, Sheffield.

OFFERED.

DISPENSING SCREEN 4 feet, mahogany and plate glass with marble slab. Drawing sent.—Barrow, Chemist, Newmarket.

PEREIRA'S 'MATERIA MEDICA,' Vols. I. and II., 1929 printed pages, 365 illustrations, 1842; by Longman, Brown, Green, and Longmans, in good condition.—Chemist, 9, Queen Street, Edgware Road, W.

DALLMEYER R. R. lens, 8 $\frac{1}{2}$ by 6 $\frac{1}{2}$, Waterhouse stops, 90s. Hand camera (Primus), 65s.—Barfoot, Compton Street, Chesterfield.

REAGENT BOTTLES.—Twenty-nine good 4-oz. glass-stoppered bottles, and twenty-two 2-oz. Any reasonable offer accepted.—Simpson, Stonebridge Park, Willesden.

PORTABLE ASSAY BALANCE, with rider, carry 2 grammes in each pan, turn with 0.1 milligramme, fitted mahogany case, new to order, received too late for customer, bargain.—Allen, Chemist, Plymouth.

Partnerships Dissolved.

[From the *London Gazette*.]

Walter Manuel Harvey Elliott and Frank Edwin Howell, trading as Manuel, Elliott, and Howell, manufacturing chemists, Backfield, Moorhead, Sheffield.

Robert Nathaniel Mitchell and William Jocelyn Foster, carried on under style of Drs. Mitchell and Foster, in the profession of Doctors of Medicine, at Chester House, Wickham Road, and 74, Lewisham High Road, Kent.

Henry James Deacon and George Ernest Davis, chemists, High Street, Beckenham, carrying on business under style of H. J. Deacon and Co. Debts will be received and paid by H. J. Deacon.

Edward Stanley Beckett and Charles Beckett, carrying on business as aerated water manufacturers at Hill Street and Hyslop Street, Liverpool, under style of E. Beckett and Co. The business will be continued by E. S. Beckett under same style as previously.

Joe Kaye and John Crossley, trading as the Elland Aerated Water Company, at Elland, Yorks.

PHOTOGRAPHIC EXHIBITIONS.—This month and next will see two exhibitions in London, the one to be held at the Agricultural Hall, Islington, in connection with the Tobacco Trades Exhibition, which some sarcastic wag has aptly said will probably all end in smoke, and the other at the Royal Aquarium, Westminster. What photography has to do with tobacco and *vice versa* is not quite clear, except that most photographers smoke inordinately.

Diary of the Week.

[Notices for insertion under this heading should reach the Editor on or before Wednesday.]

MONDAY, JULY 1.

Royal Institution of Great Britain, at 5 p.m.
General Monthly Meeting.

TUESDAY, JULY 2.

Pharmaceutical Society of Great Britain.
Benevolent Fund Committee.
Finance Committee.
General Purposes Committee.

WEDNESDAY, JULY 3.

Pharmaceutical Society of Great Britain.
Council Meeting at 11 a.m.
Plymouth, Devonport, Stonehouse, and District Chemist Association, at 7.30 p.m.
"Night Charges for Dispensing," Discussion a, Introduced by J. D. Turney.

FRIDAY, JULY 5.

Geologists' Association (London), at 8 p.m.
"Sketch of the Geology of County Antrim," by Alex. McHenry.
"The Mourne Mountains," by R. Lloyd Praeger.

Trade Marks Applied For.

[From the *Trade Marks Journal*.]

No. 186,753.—CHEMICAL SUBSTANCES used in manufactures, photography, or philosophical research, but not including acids, alkalies, vitrified porcelain enamel for coating metals, or anti-corrosives, and not including any goods of a like kind to these excluded goods.—Colthurst and Harding, 11, Queen Victoria Street, London, E.C. April 3, 1895. Device: A kangaroo.

No. 186,454.—A DISINFECTING AND DEODORISING FLUID.—The Liverpool Shipowners' Supply Company, Limited, 13, South Castle Street, Liverpool. March 23, 1895. Word: "Zacra."

No. 187,347.—CHEMICAL SUBSTANCES prepared for use in medicine and pharmacy.—The Laxco Company, 39, Baker Street, London, W. May 1, 1895. Device: A dish with handle with the name of applicants printed on.

No. 187,286.—FULLER'S EARTH for manufacturing purposes.—The British Fuller's Earth Company, Limited, Woburn Sands, Bucks. April 29, 1895. Device: A boar's head and the initials of applicants at four corners. The essential particular is the device.

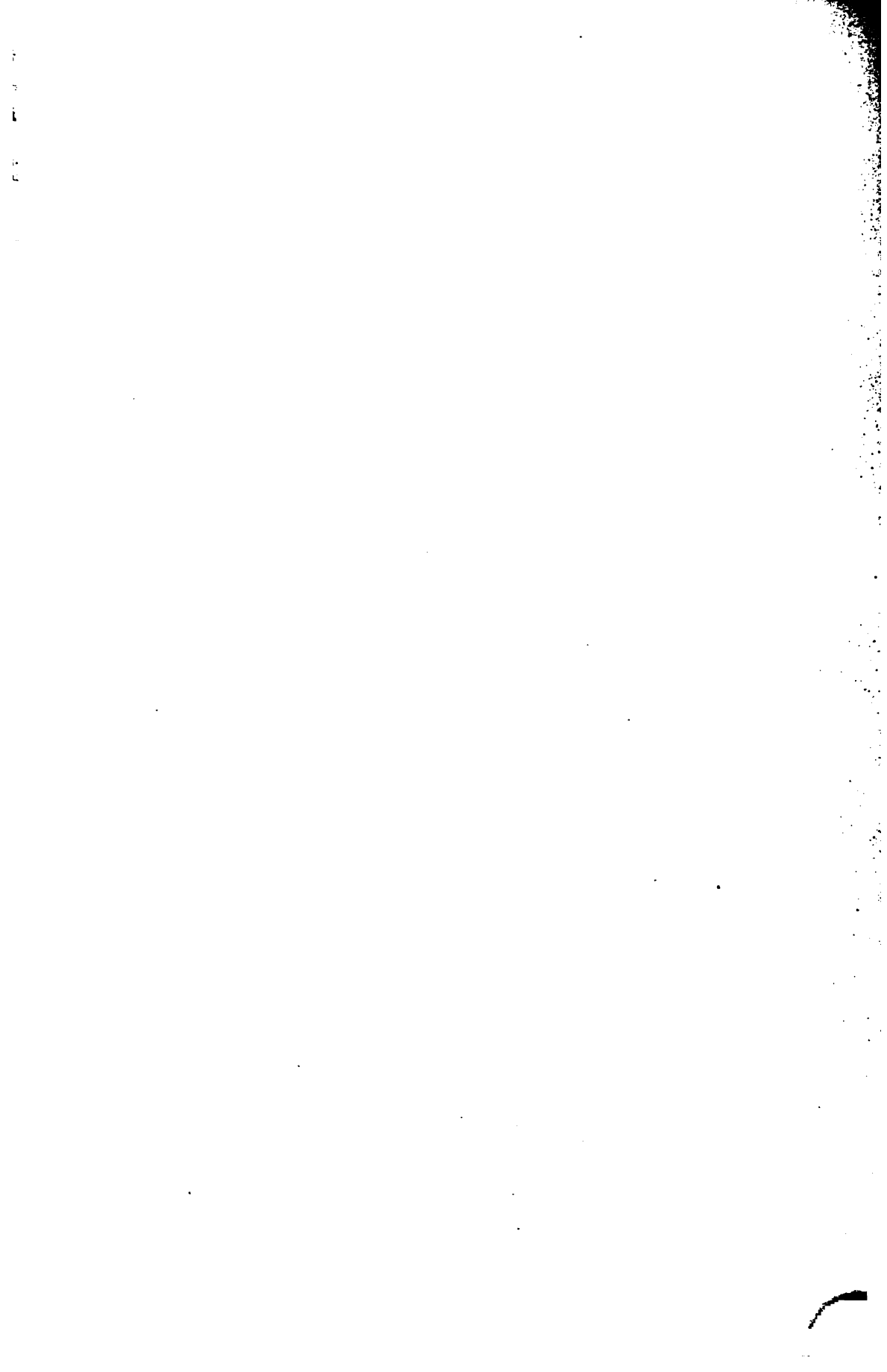
Late News.

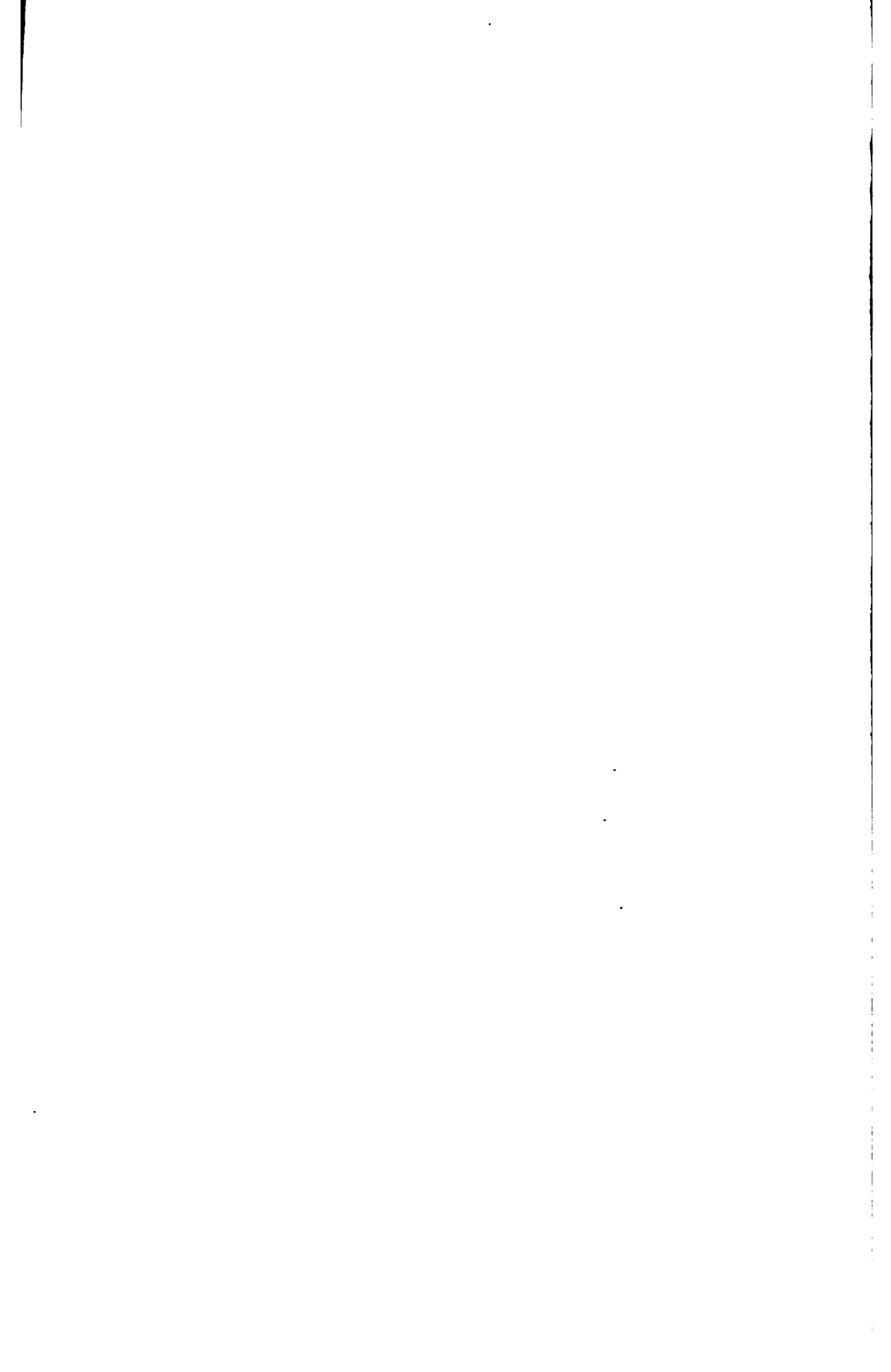
PHARMACEUTICAL SOCIETY OF IRELAND v. FANFAN.—Judgment was delivered in this case (see P. J., June 15, p. 1161) on Thursday last, when the defendants were convicted of selling poisons without being qualified under the Irish Pharmacy Acts. Mr. Swift imposed mitigated penalties of three pounds in each of the three cases, with costs, amounting in all to ten guineas.

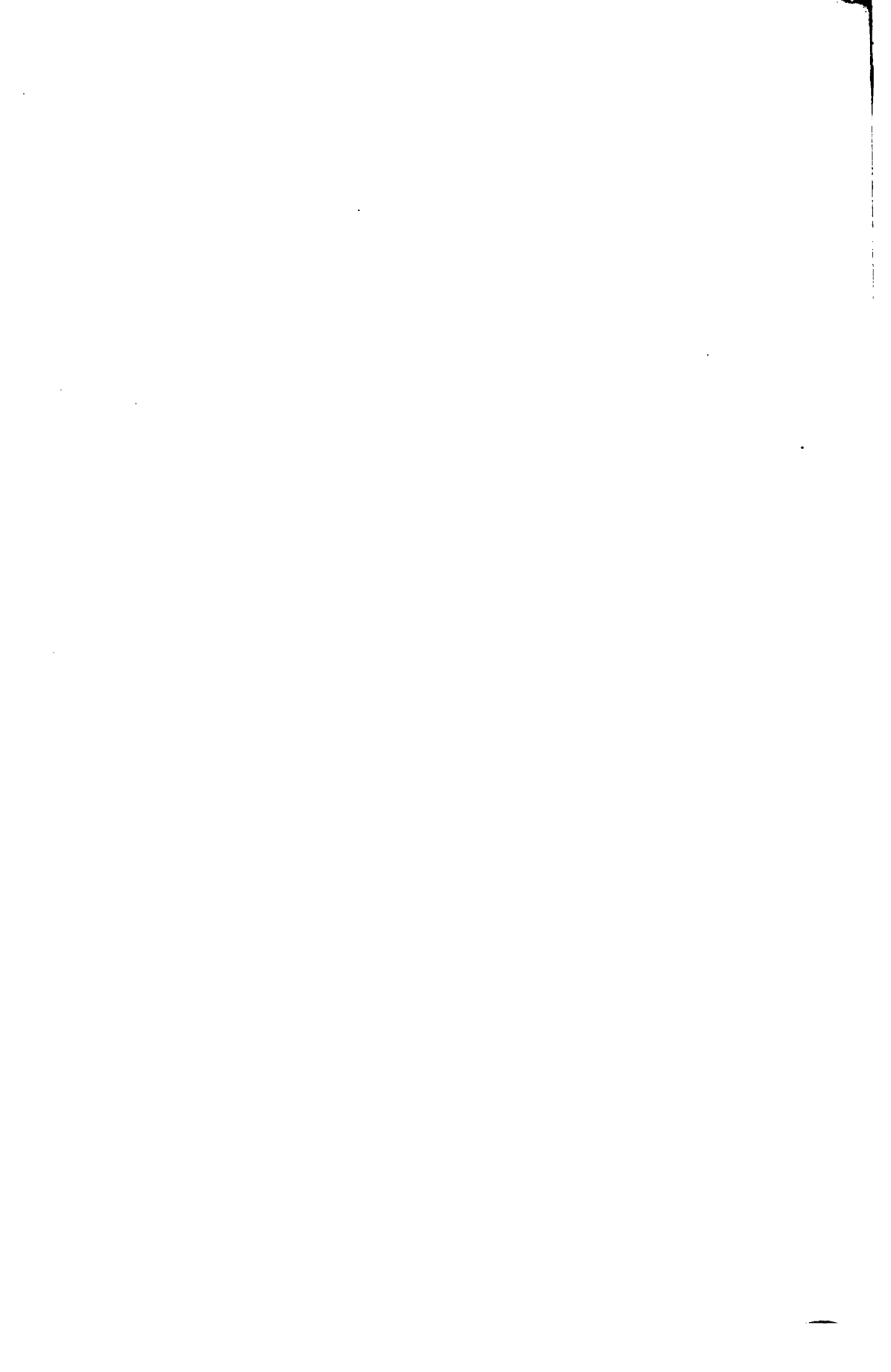
Late Advertisement.

Business for Disposal.

SPECIAL.—A good opportunity to succeed to a select Prescribing or Dispensing BUSINESS. Seaside town, North Wales. Cash required about £1000; part can remain. Address, Box 51,073, Smith's Advt. Agency, 132, Fleet St., E.C.







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